

REPORT OF
**THE FORTY-SECOND MEETING OF THE PROGRAM COMMITTEE
OF THE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

Chiang Mai, Thailand
11 - 13 November 2019



**THE SECRETARIAT
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

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EXECUTIVE SUMMARY

The Forty-second Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Chiang Mai, Thailand from 11 to 13 November 2019 and hosted by the SEAFDEC Training Department (TD). The Secretary-General of SEAFDEC, in her capacity as the Chairperson of SEAFDEC Program Committee, chaired the Meeting which reviewed the programs implemented by SEAFDEC in 2019 and scrutinized the programs to be implemented in 2020 to ensure that these have been formulated and implemented in line with the priorities and needs of the Member Countries. The list of SEAFDEC Programs and Projects for 2019-2020 appears in *Appendix 1*.

For the **Programs under the FCG/ASSP Mechanism**, which comprise twenty-one (21) projects that have been categorized under the six (6) SEAFDEC Strategies: 1) Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region; 2) Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region; 3) Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region; 4) Enhancing trade and compliance of the region's fish and fishery products with market requirements; 5) Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries; and 6) Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries; and two (2) Special Projects, the Program Committee noted that 20 projects would be completed in 2019, while three (3) projects would be continued in 2020. The Program Committee also reviewed the thirteen (13) new projects under the FCG/ASSP Mechanism that are scheduled to commence in 2020, and the five (5) Pipeline Projects, of which SEAFDEC is securing the necessary funding for their implementation. The Program Committee then approved the implementation of the projects in 2019-2020, and provided recommendations that are summarized as follows:

Strategy I: Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region

- (1) **Human Resource Development for Sustainable Fisheries**
 - SEAFDEC to consider developing performance indicators in relation to the project objectives to facilitate effective and efficient review of the projects by the Program Committee Members
 - TD to consider expanding the project activities in the future to cover inland fisheries
 - TD to introduce the EAFM concept in Myanmar through the training of trainers (TOTs)
 - TD to expand the activities related to the promotion of EAFM in other areas of Lao PDR in the future
- (2) **Optimizing Energy Use/Improving Safety Onboard in Fishing Activities**
 - TD to package and disseminate the purse seine vessel modification technique through appropriate information materials for dissemination to the Member Countries
- (3) **Promotion of Sustainable Fishery Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia**
 - TD to develop maps of important fishing grounds and critical habitats of relevant species in the region based on data collected from SEAFDEC programs, which could serve as platform for information sharing on resource enhancement activities
 - TD to establish pilot sites in the region to determine the benefits of the project and conduct relevant regional training programs
 - TD to develop protocols for rehabilitation of depleted stocks of different wild species, *e.g.* blue swimming crab, dog conch, and others, and enhance cooperation with AQD in mobilizing the technologies on seed production of such species
- (4) **Enhancement of the Sustainability of Catadromous Eel Resources in Southeast Asia**
 - SEAFDEC to continue supporting the Philippines in improving data collection and management of catadromous eel resource in the country
- (5) **Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia**
 - The 42PCM took note of the progress of the project in 2019.

- (6) **Promotion of Countermeasures to Reduce IUU Fishing Activities**
- TD to consider synthesizing the data in the RFVR Database for dissemination to the Member Countries
 - TD to find the ways of improving the existing RFVR Database prior to expanding the database to cover small fishing vessels, taking into account the relevant economic, livelihood, and political considerations in designing the specific activities in the future
 - Should the development of database for the vessels less than 24 meters in length be considered, TD to determine the appropriate approaches for inputting the necessary data, for example by importing the data from the countries' databases, considering the large number of small-scale fishing vessels in the region
- (7) **Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand¹**
- Project to incorporate the establishment of *refugia* sites and development of management measures toward the sustainability of various species (*e.g.* squid) that are economically important for the Southeast Asian region
- (8) **Offshore Fisheries Resources Exploration in Southeast Asia**
- TD to continue providing capacity building to the Member Countries on stock assessment
 - In future development of project documents, TD to ensure that the titles of project documents reflect the actual activities being proposed
- (9) **Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in the Southeast Asian Region**
- The 42PCM took note of the progress of the project in 2019.
- (10) **Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region**
- MFRDMD to consider alternative solutions for appropriate management measures for purse seine fisheries in the region which should not be based only on output control such as catch limit but also input and technical control
 - MFRDMD to consider improving the accuracy of calculating the catch per unit effort (CPUE)
 - MFRDMD to conduct data analysis of the same dataset collected by the project using another method, to be able to include the range of uncertainties, and compare and understand the results
- (11) **Research for the Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region**
- The 42PCM took note of the progress of the project in 2019.
- (12) **Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia**
- SEAFDEC to combine all projects related to anguillid eel resources that are implemented by SEAFDEC, and report the progress of such projects as one group
- (13) **SEAFDEC-EU/CITES Sharks Project Phase II**
- The 42PCM took note of the progress of the project in 2019.
- (14) **Strengthening the Effective Management Scheme with GIS (Geographic Information System) and RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture in the AMS²**
- Project to extend support to Thailand through the conduct of training programs for concerned officers of the DOF Thailand

¹ This project will be continued in 2020

² This project will be continued in 2020

Strategy II: Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region

(15) Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources

- AQD to consider implementing in the future, more activities on aquaculture considering its potential benefits to poverty alleviation and improved livelihood of people in the fisheries communities
- AQD to consider expanding its activities on fishmeal replacement for feeds for marine species, e.g. sea bass and grouper

(16) Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region

- The 42PCM took note of the progress of the project in 2019.

Strategy III: Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region

(17) Chemicals and Drug Residues in Fish and Fish Products in Southeast Asia- Biotoxins (ASP, AZA and BTX) and Harmful Algal Blooms (HABs) in the ASEAN Region

- The 42PCM took note of the progress of the project in 2019.

Strategy IV: Enhancing trade and compliance of the region's fish and fishery products with market requirements

(18) Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products

- The 42PCM took note of the progress of the project in 2019.

Strategy V: Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries

(19) Assistance for Capacity Building in the Region to Address International Fisheries-related Issues

- The 42PCM took note of the progress of the project in 2019.

Strategy VI: Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries

(20) Fisheries Resource Survey and Operational Plan for the M.V. SEAFDEC 2²

- TD to consider supporting the conduct of hydroacoustic survey of fishing grounds in the Philippines and studies on the distribution of biomass of small pelagic fishes, taking into consideration the existing expertise and equipment in SEAFDEC and Member Countries
- TD to support Myanmar in its fisheries resources survey of shallow waters and coastal areas that are beyond the survey plan of the R.V. Dr. Fridtjof Nansen Project to provide support to Myanmar in building up the capacity of its officers in conducting surveys in the waters of Myanmar, in 2020-2024
- SEAFDEC to consider cooperating in the joint R.V. Dr. Fridtjof Nansen survey in the BOBLME of Myanmar and Thailand, and sharing of the information obtained from the surveys using the R.V. Dr. Fridtjof Nansen and the M.V. SEAFDEC 2 that are useful for the participating countries
- TD to consider extending support to officers of the Philippines in the conduct of acoustic surveys in the country's waters for the officers to obtain hands-on experience
- TD to consider acquiring a new scientific echo-sounder to be used during the surveys of the waters of the Southeast Asian countries

(21) Strengthening SEAFDEC Network for Sustainable Fisheries

- The 42PCM took note of the progress of the project in 2019.

Special Projects

- (1) **Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia**
 - The 42PCM took note of the progress of the project in 2019.
- (2) **The Oceans and Fisheries Partnership (USAID Oceans)**
 - The 42PCM took note of the progress of the project in 2019.

New Proposed Projects for the Year 2020

- (1) **Strengthening a Regional Cooperation and Enhancing National Capacities to Eliminate IUU Fishing in Southeast Asia**
 - TD to promote wider application of the eACDS in the region in order that similar documentation schemes would be adopted among the ASEAN Member States (AMSs)
 - TD to consider fostering closer collaboration with the private sector in the implementation of the Project activities
 - Project to include promotion of enhanced cooperation among the AMSs for sharing of relevant information and set up a network for combating IUU fishing in the region
 - TD to improve the RFVR Database to ensure that it could support the implementation of monitoring, control, and surveillance (MCS) in the future
 - For effective project document review, the Project to indicate the specific, measurable, achievable, realistic, and timely (SMART) objectives as well as include clear indications of project outputs, outcomes, and long-term impacts, and the mechanism for monitoring and evaluation of project implementation
 - Regarding the development of the database for vessels less than 24 meters in length, the Project to include determining of the specific range of the lengths of vessels for the database
 - Project to incorporate an analysis of the information in the RFVR Database similar to that of fishery statistics, to facilitate better understanding of the Database by the AMSs
 - SEAFDEC to consider establishing the links for sharing of the data related the eACDS among the AMSs
 - Project to include more frequent training sessions on the implementation of post State measures (PSM)
- (2) **Harmonization and Enhancing Utilization of Fishery Statistics and Information**
 - SEAFDEC Secretariat to encourage the AMSs to upgrade their respective fisheries statistical systems, including reporting of fishery statistics at species level as the information is necessary for stock assessment of the species
 - SEAFDEC Secretariat to consider harmonizing the timeline between the FAO SOFIA and SEAFDEC SEASOFIA, *e.g.* publishing SEASOFIA every two or four years
 - SEAFDEC Secretariat to extend meeting invitations to other Philippine agencies (not only to BFAR) responsible for fishery statistics in the Philippines
- (3) **Responsible Fishing Technology and Practices**
 - SEAFDEC to consider including in the Project, the development of responsible fishing technologies and practices for inland waters
 - SEAFDEC to consider supporting the AMSs in the implementation of the FAO Voluntary Guidelines on the Marking of Fishing Gear, considering that the Guidelines has already been promoted by FAO
 - SEAFDEC could consider organizing experts' workshops on proper marking of different types of gears, particularly trawls and gillnets
 - SEAFDEC to consider incorporating in the Project, additional activities such as reducing fuel consumption, enhancing safety at sea, reducing carbon emission, and improving onboard fish handling using chilled seawater and salt
 - TD to conduct a pilot study or extension activity on the impacts of some gears (*e.g.* collapsible traps, trawls with small mesh size at codend) and share the results from relevant studies undertaken in the past, with the fishers as well as law enforcers of the region
- (4) **Enhancing Food Safety and Competitiveness of Seafood Products**
 - MFRD to consider addressing the issues on seafood marketability as part of the competitiveness objective of the project

- (5) **Assistance for Capacity Development in the Region to Address International Fisheries-related Issues**
 - The 42PCM took note of the progress of the project in 2019.
- (6) **Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region**
 - Project to include risk assessment for selected shark species as well as the use of appropriate stock assessment models (*i.e.* data limited methods) considering the shark statistics data that are available in the region
- (7) **Sustainable Utilization of Anguillid Eels in the Southeast Asian Region**
 - The 42PCM took note of the progress of the project in 2019.
- (8) **Sustainable Utilization of Fisheries Resources and Resources Enhancement in Southeast Asia**
 - TD to conduct training for staff of DOF Thailand onboard the M.V. SEAFDEC 2 during its cruise surveys, which could include the aspects on fishing and marine engine operations
- (9) **Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region**
 - Project to include a compilation of existing management measures for small pelagic species at national level that are available
 - Project to also clarify and define the scoping of activities, the connectivity and broad range of life history for selected species as these affect the sampling strategy
 - Project to incorporate the capacity building needs for fishery managers to enable them to translate the scientific findings into policies
 - Project to consider including a literature review of existing information on stock status and biology for neritic tunas from the Working Party on Neritic Tunas of IOTC
- (10) **Sustainable Aquaculture through Cost-Effective Culture Systems, and Prompt and Effective Aquatic Animal Health Management**
 - AQD to consider involving Indonesia in the capacity building related activities
 - Project to include activities on aquaculture of ornamental fishes and indigenous fish species, and marine aquaculture in floating cages adopting good aquaculture practices (GAqP) taking into account the optimum carrying capacity of water areas
- (11) **Management Scheme for Inland Fisheries in the Southeast Asian Region**
 - IFRDMD to include the Philippines as a learning site of the Project
 - IFRDMD to consider involving Lao PDR in the Project, in particular on the activity related to data collection and analysis
 - IFRDMD to conduct the training course on data collection and stock assessment of inland fisheries in preparation for the compilation of baseline data on inland fisheries in the region
 - IFRDMD to consider supporting the capacity building activities of Myanmar in the management of inland fisheries
- (12) **Small-scale Fisheries Management for Better Livelihood and Fisheries Resources**
 - Project to indicate the intention of Indonesia to co-organize the Workshop on Assessing the Needs of the AMS in Implementing the FAO SSF Guidelines with respect to market access, in Bali, Indonesia in February 2020
 - Project to include the conduct of EAFM activities in other pilot sites in inland areas of Thailand
 - Project to involve the Philippines in sharing experiences gained from the implementation of EAFM in the Philippines
 - Project to include Lao PDR in the implementation of Project activities
- (13) **Development of Stock Assessment Method for Strengthening of Resources Management Measures of Tropical Anguillid Eels in AMS**
 - The 42PCM took note of the progress of the project in 2019.

The Program Committee also endorsed the progress of the **Departmental Programs** in 2019 comprising twelve (12) programs, six (6) of which were implemented by AQD, namely: 1) Quality Seed for Sustainable Aquaculture; 2) Healthy and Wholesome Aquaculture; 3) Maintaining Environmental Integrity through Responsible Aquaculture; 4) Meeting Social and Economic Challenges in Aquaculture; 5)

Adapting to Climate Change Impacts; and 6) Collaborative projects with the Philippine Government; two (2) by TD: 1) Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building; and 2) Improvement of Fisheries Technology and Reduction of the Impact from Fishing; and four (4) by IFRDMD: 1) Stock Assessment in Inland Fisheries; 2) Development of Capacity Building Plan to support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules and Conducting Training of Trainers on EAFM/EAA; 3) Improve livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence; and 4) Modernizing Irrigated Agriculture to Protect and Restore Aquatic Biodiversity and Ecosystem Services in Southeast Asia. The Program Committee then provided recommendations on these programs which are summarized as follows:

1. Aquaculture Department

- AQD to consider sharing the results of its Departmental programs with the other AMSs in order that these could be adapted by the countries their efforts towards achieving the sustainable development of aquaculture
- AQD to also share its experiences and disseminate the technologies generated from its numerous activities for the benefit of the other SEAFDEC Member Countries

2. Training Department

- TD to consider including the participation of MFRDMD in the training in Japan on hydroacoustic research, especially on the use of scientific echo-sounder

3. Inland Fishery Resources Development and Management Department

- IFRDMD to consider collaborating with other SEAFDEC Departments in the implementation of its Departmental programs (*e.g.* stock enhancement, EAFM, EAAM)

The Program Committee took note the progress of the **Other Program** on “Implementing the Lower Mekong Fish Passage Initiative in Cambodia, Thailand, and Viet Nam” which was implemented in 2019 and the proposed activities of the project in 2020, and also noted the status of the five (5) **Pipeline Projects**:

(1) ASEAN-JICA Food Value Chain Development Project

- Project to include public-private partnership in the Project activities

(2) ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Countermeasures in Southeast Asia

- Project to include Viet Nam in the implementation of activities to support the country’s efforts in combating IUU fishing

(3) Gender Dimension in the Value Chain of Small-scale Fisheries & Aquaculture in Southeast Asia

- The 42PCM took note of the progress of the project in 2019.

(4) FAO-GEF Project: Sustainable Management of Fisheries, Marine Living Resources and Their Habitats in the Bay of Bengal Region for the Benefit of Coastal States and Communities: Support to SEAFDEC Member Countries

- SEAFDEC to consider involving MFRDMD in the project planning and implementation considering its mandate and responsibility to promote sustainable fisheries management in the region

(5) World Bank Project: Piloting the Electronic ASEAN Catch Documentation Scheme (eACDS) in Viet Nam

- SEAFDEC to consider establishing a learning site in existing tourism areas in order Thailand, *e.g.* in Krabi Province of Thailand, to expand the market access for small-scale fisheries communities by building upon the success of the EAFM learning sites.

On the statements delivered by non-member governments and international/regional organizations, namely: the Food and Agriculture Organization of the United Nations/Regional Office for Asia and Pacific (FAO/RAP), Inland Fisheries Training Center of Gifu Prefecture in Japan, Japan International Cooperation Agency (JICA), and the United States Agency for International Development/Regional Development Mission for Asia (USAID/RDMA), the Program Committee took note of the presentation on the “New

Regional Marine Conservation Activity Design” by the representative from USAID/RDMA building upon the successes of the USAID Oceans activities in combating IUU fishing and promoting sustainable fisheries, and the intention of the U.S. Government to continue supporting the biodiversity conservation activities in the region subject to the availability of funds.

While taking note of the efforts made by the SEAFDEC Secretariat in facilitating the revision of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020, which in response to the directive of the SEAFDEC Council during its Meeting in 2018, the Program Committee commended the SEAFDEC Secretariat for coming up with the Draft Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030.

The Program Committee noted the outputs of the “Capacity Development Workshop on Stock Status Assessment and Estimation of SDG Indicator 14.4.1 for the Asia Pacific Region”, which was conducted jointly by FAO and SEAFDEC on 2-4 October 2019 in Bangkok, Thailand. The Program Committee also noted the draft Procedures for Establishment of Cooperation between SEAFDEC and Other Organizations which was developed in response to the request of the Council Director for Japan, indicating the several types of organizations that the SEAFDEC Secretariat and Departments wish to establish cooperation with in line with the Article 12 and Article 13 of the Agreement on Establishing SEAFDEC, as well as the different procedures for approval.

The Program Committee adopted the **Report of the 42nd Meeting of the SEAFDEC Program Committee** for submission to the 52nd Meeting of SEAFDEC Council, and to the ASEAN through the 22nd Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).

SEAFDEC Programs and Projects for the Year 2019-2020

I. Programs of Activities under FCG/ASSP Mechanism

Strategy/Project Title	Lead Department	2019	2020
Strategy I: Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region			
1. Human Resource Development for Sustainable Fisheries	TD	Y	N
2. Optimizing Energy Use/Improving Safety Onboard in Fishing Activities	TD	Y	N
3. Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia	TD	Y	N
4. Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia	IFRDMD	Y	N
5. Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia	IFRDMD	Y	N
6. Promotion of Countermeasures to Reduce IUU Fishing Activities	TD	Y	N
7. Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand	TD	Y	Y
8. Offshore Fisheries Resources Exploration in Southeast Asia	TD	Y	N
9. Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region <ul style="list-style-type: none"> • Improving the Data Collection of the Commercially-exploited Aquatic and Threatened Species • Facilitating fisheries activity information gathering through introduction of Community-based Resources Management/Co-management 	TD	Y	N
10. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD	Y	N
11. Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD	Y	N
12. Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia	SEC	Y	N
13. SEADFDEC-EU/CITES Sharks Project Phase II	SEC	Y	N
14. Strengthening the Effective Management Scheme with GIS (Geographic Information System) & RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMSs.	TD	Y	Y
Strategy II :Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region			
15. Environment-Friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources	AQD	Y	N
16. Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region	AQD	Y	N
Strategy III :Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region			
17. Chemicals and Drug Residues in Fish and Fish Products in Southeast Asia Biotoxins (ASP, AZA and BTX) and Harmful Algal Bloom (HABs) in the ASEAN region.	MFRD	Y	N

Strategy/Project Title	Lead Department	2019	2020
Strategy IV: Enhancing trade and compliance of the region's fish and fishery products with market requirements			
18. Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products	MFRDMD	Y	N
Strategy V: Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries			
19. Assistance for Capacity Building in the Region to Address International Fisheries-related Issues	SEC	Y	N
Strategy VI: Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries			
20. Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2	TD	Y	Y
21. Strengthening SEAFDEC Network for Sustainable Fisheries	SEC	Y	N
Special Projects			
22. Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia	SEC	Y	N
23. The Oceans and Fisheries Partnership (USAID Oceans)	TD	Y	N

New proposed Projects for the Year 2020

Strategy/Project Title	Lead Department	Period
1. Strengthening a Regional Cooperation and Enhancing National Capacities to Eliminate IUU Fishing in Southeast Asia	TD	2020-2024
2. Harmonization and Enhancing Utilization of Fishery Statistics and Information	SEC	2020-2024
3. Responsible Fishing Technology and Practice	TD	2020-2024
4. Enhancing Food Safety and Competitiveness of Seafood Products	MFRD	2020-2024
5. Assistance for Capacity Development in the Region to Address International Fisheries-related Issues	SEC	2020-2024
6. Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD	2020-2024
7. Sustainable Utilization of Anguillid Eels in the Southeast Asian Region	IFRDMD	2020-2024
8. Sustainable Utilization of Fisheries Resources and Resources Enhancement in Southeast Asia	TD	2020-2024
9. Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region	MFRDMD	2020-2024
10. Sustainable Aquaculture through Cost-Effective Culture Systems, and Prompt and Effective Aquatic Animal Health Management	AQD	2020-2024
11. Management Scheme for Inland Fisheries in the Southeast Asian Region	IFRDMD	2020-2024
12. Small-scale Fisheries Management for Better Livelihood and Fisheries Resources	TD	2020-2024
13. Development of Stock Assessment Method for Strengthening of Resources Management Measures of Tropical Anguillid Eels in AMS	SEC	2020-2021

II. Departmental Programs

Programs/Projects	Department	2019	2020
1. Quality Seed for Sustainable Aquaculture	AQD	Y	Y
2. Healthy and Wholesome Aquaculture	AQD	Y	Y
3. Maintaining Environmental Integrity through Responsible Aquaculture	AQD	Y	Y
4. Meeting Social and Economic Challenges in Aquaculture	AQD	Y	Y
5. Adapting to Climate Change	AQD	Y	Y
6. Priority and Special Projects	AQD	Y	N
7. Collaborative Projects with the Philippine Government	AQD	N	Y
8. Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building	TD	Y	Y
9. Improving of Fisheries Technology and Reduction of the Impact from Fishing Activities	TD	Y	Y
10. Stock Assessment in Inland Fisheries	IFRDMD	Y	Y
11. Development of Capacity Building Plan to support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules and Conducting Training of Trainers on EAFM/EAA	IFRDMD	Y	N
12. Improve Livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence	IFRDMD	Y	Y
13. Modernizing Irrigated Agriculture to Protect and Restore Aquatic Biodiversity and Ecosystem Services in South-East Asia	IFRDMD	Y	Y

III. Other Programs

Projects Title	Department	2019	2020
1. Implementing the Lower Mekong Fish Passage Initiative in Cambodia, Thailand, and Viet Nam	TD	Y	Y

IV. Pipeline Projects

Projects Title	Lead Department	Period
1. ASEAN-JICA Food Value Chain Development Project	SEC	-
2. ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Conutermeasures in Southeast Asia	TD	-
3. Gender Dimension in the Value Chain of Small-scale Fisheries & Aquaculture in Southeast Asia	TD	2020-2021
4. Sustainable Management of Fisheries, Marine Living Resources and Their Habitats in Bay of Bengal for the Benefit of Coastal States and Communities: Support to SEAFDEC Member Countries	TD	-
5. Piloting the Electronic ASEAN-Catch Documentation Scheme (eACDS) in Viet Nam	TD	-

Remarks:

Y = Program implemented during the year

N = Program not implemented during the year

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LIST OF ACRONYMS

ACDS	ASEAN Catch Documentation Scheme
AFAS	Asian Fisheries Acoustic Society
AHPND	Acute Hepatopancreatic Necrosis Disease
AMAF	ASEAN Ministers on Agriculture and Forestry
AMSs	ASEAN Member States
ANAAHC	ASEAN Network of Aquatic Animal Health Centres
APFIC	Asia Pacific Fisheries Commission
AQD	SEAFDEC Aquaculture Department
ARs	Artificial Reefs
ASEAN	Association of Southeast Asian Nations
ASSP	ASEAN-SEAFDEC Strategic Partnership
ASWGFi	ASEAN Sectoral Working Group on Fisheries
BOBLME	Bay of Bengal Large Marine Ecosystem
CDTS	Catch Documentation and Traceability System
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DOF	Department of Fisheries
EAAM	Ecosystem Approach to Aquaculture Management
EAFM	Ecosystem Approach to Fisheries Management
EEZs	Exclusive Economic Zones
EMS	Early Mortality Syndrome
ETP	Endangered, Threatened and Protected
EU	European Union
FADs	Fish Aggregating Devices
FAO	Food and Agriculture Organization of the United Nations
FCG	ASEAN-SEAFDEC Fisheries Consultative Group
FEDs	Fish Enhancing Devices
GEF	Global Environmental Facility
GIS	Geographic Information System
HABs	Harmful Algal Blooms
IFRDM	SEAFDEC Inland Fishery Resources Development and Management Department
ILO	International Labour Organization
IOTC	Indian Ocean Tuna Commission
IUCN	The International Union for Conservation of Nature
IUU Fishing	Illegal, Unreported and Unregulated Fishing
JAIF	Japan-ASEAN Intergration Fund
JICA	Japan International Cooperation Agency
JTED	Juvenile and Trash Excluder Devices
JTF	Japanese Trust Fund
MCS	Monitoring, Control and Surveillance
MCs	Member Countries
MFRD	SEAFDEC Marine Fisheries Research Department
MFRDM	SEAFDEC Marine Fishery Resources Development and Management Department
MSY	Maximum Sustainable Yield
NACA	Network of Aquaculture Centres in Asia-Pacific
NDFs	Non Detriment Findings
NPOA	National Plan of Action
PCM	SEAFDEC Program Committee Meeting
PSM	Port State Measures
PSMA	Port State Measures Agreement
RFMOs	Regional Fisheries Management Organizations
RFPN	Regional Fisheries Policy Network
RFVR	Regional Fishing Vessels Record
RPOA	Regional Plan of Action
RS	Remote Sensing
RTC	Regional Technical Consultation
SEAFDEC	Southeast Asian Fisheries Development Center
SDGs	Sustainable Development Goals
SOM-AMAF	Senior Officials Meeting of the ASEAN Ministers on Agriculture and Forestry

SOP	Standard Operating Procedure
SwAM	The Swedish Agency for Marine and Water Management
TAC	Total Allowable Catch
TAE	Total Allowable Effort
TiLV	Tilapia Lake Virus
TD	SEAFDEC Training Department
UNEP	United Nations Environment Programme
USAID	U.S. Agency for International Development
US-DOI	U.S. Department of Interior
VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission

REPORT OF THE FORTY SECOND MEETING OF THE PROGRAM COMMITTEE OF THE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

**Chiang Mai, Thailand
11-13 November 2019**

INTRODUCTION

1. The Forty-second Meeting of the Program Committee (42PCM) of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Chiang Mai, Thailand from 11 to 13 November 2019 and hosted by the SEAFDEC Training Department (TD).

2. The 42PCM was attended by the SEAFDEC Program Committee Members for Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam together with their respective delegations. Representatives from collaborating agencies, namely: the Food and Agriculture Organization of the United Nations/Regional Office for Asia and Pacific (FAO/RAP), Inland Fisheries Training Center of Gifu Prefecture in Japan, Japan International Cooperation Agency (JICA), and the United States Agency for International Development/Regional Development Mission for Asia (USAID/RDMA), as well as the SEAFDEC Secretary-General, Deputy Secretary-General, and Department Chiefs as *ex-officio* members of the SEAFDEC Program Committee together with officers from the SEAFDEC Secretariat and Departments, also attended the Meeting. The List of Participants appears as **Annex 1**.

I. OPENING OF THE MEETING

3. The Secretary-General of SEAFDEC *Ms. Malinee Smithrithee*, in her capacity as Chairperson of the Program Committee, welcomed the participants and observers to the Meeting. She explained that the discussion during the Program Committee Meeting would start with the Programs under the FCG/ASSP followed by the review of projects under the Departmental and Pipeline Projects. She also encouraged the Program Committee and collaborating partners to provide comments and advice on the SEAFDEC programs to ensure that these address the needs and requirements of the fisheries sector of the region. She reiterated that the recommendations raised during the Meeting would be submitted to the SEAFDEC Council and the ASEAN Sectoral Working Group on Fisheries or ASWGF_i through the Twenty-second Meeting of FCG/ASSP which will be held back-to-back with this 42PCM. With that note, she declared the 42PCM open. Her Opening Remarks appears as **Annex 2**.

4. While thanking TD for arranging the Meeting in Chiang Mai and congratulating *Ms. Malinee Smithrithee* on her appointment as the Secretary-General of SEAFDEC, the Members of the Program Committee looked forward to having the sustained implementation of programs that would enhance the contribution of fisheries to food security in the Southeast Asian region.

II. ADOPTION OF THE AGENDA AND ARRANGEMENTS OF THE MEETING

5. In response to the concern raised by the Program Committee Member for Indonesia on the need to adopt an efficient time management of the Meeting considering the number of projects that would be reviewed, the 42PCM was assured that the time allocation for presentations and discussions indicated in the working documents would be heeded strictly.

6. The Agenda which appears as **Annex 3** was adopted.

III. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2019 AND PROPOSED PROGRAMS FOR THE YEAR 2020

7. The 42PCM took note of the progress and achievements of 23 ongoing projects under the FCG/ASSP Mechanism, comprising 21 projects that are categorized based on the SEAFDEC Program Thrusts, and two Special Projects. Out of these projects, 20 projects would be completed in 2019, while three projects would be continued in 2020. The Program Committee also reviewed the 13 new projects under the FCG/ASSP Mechanism that are scheduled to commence in 2020, as well as the 10 Departmental Programs, and one Other Program. Results of the review of the projects implemented in 2019 and the

programs of activity proposed for 2020, as reported by the SEAFDEC Secretariat and Departments and incorporating the recommendations of the 42PCM, would be submitted to the SEAFDEC Council and higher authorities of the ASEAN for approval.

3.1 Programs under the FCG/ASSP Mechanism

8. While noting the progress and achievements of the programs implemented by the SEAFDEC Secretariat and the Departments in 2019, and after reviewing the activities proposed for 2020 under the FCG/ASSP Mechanism (**Annex 4**), the 42PCM approved the activities for 2020 and provided the ways and means of improving the projects and activities to respond to the needs and requirements of the Member Countries.

3.1.1 Strategy I: Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region

(1) Human Resource Development for Sustainable Fisheries

9. The 42PCM was informed by the representative from TD that although this project would be completed in 2019, the promotion of the Ecosystem Approach to Fisheries Management (EAFM) concept would be continued under the new project which would be supported by the Japanese Trust Fund 6 Phase II (JTF6-II) starting 2020.

10. During the discussion, the Program Committee Member for the Philippines, while commending SEAFDEC for the successful implementation of the activities under the project, raised the concern that the proposed expected output of the project such as improved well-being and income by adding value to the catch might not have been considered in the project design. He therefore suggested that in the future, SEAFDEC could consider developing performance indicators in relation to the project objectives to facilitate the effective and efficient review of the projects by the Program Committee Members.

11. In this connection, the representative from TD explained that the human well-being component has been incorporated in the project activities through the promotion of EAFM at the learning sites, *e.g.* in Cambodia where the income of fishers has improved after one year of the project implementation. Although the support of SEAFDEC to carry out the activities in the learning sites would be completed in 2019, the participating countries had been encouraged to continue the activities at the learning sites, and to monitor the long-term improvement of fishers' livelihood and income as a result of the application of the EAFM concept.

12. While expressing the support to the activities carried out at the learning sites in Cambodia as this has improved the knowledge of fisheries officers on the EAFM concept, the Program Committee Member for Cambodia indicated that the Fisheries Management Plan which is being developed by the Fisheries Administration (FiA) of Cambodia would incorporate the EAFM concept. He therefore suggested that SEAFDEC could consider expanding the project activities in the future to cover inland fisheries. He also expressed the concern about the destruction of large areas of mangrove forests in marine fishing domain and inundated forests in Cambodia, and the need to enhance people's awareness of the need to conserve mangroves and inundated forests to sustain fisheries production.

13. The Program Committee Member for Myanmar also commended SEAFDEC for introducing the EAFM concept in Myanmar which was carried out through the training of trainers (TOTs), as this had considerably helped to instill the knowledge on EAFM concept in the officers of the Department of Fisheries of Myanmar and enabled them to promote the application of EAFM in the country. She also stated that Myanmar has implemented the EAFM under the FishAdapt Project in collaboration with FAO/GEF, and several deliverables have been produced such as the EAFM Toolkit, EAFM Handbook, and the Ecosystem Approach to Aquaculture Management (EAAM) Handbook in the national language of Myanmar. In addition, Myanmar is planning to conduct EAFM training not only for responsible fisheries agencies but also for other line agencies nationwide. In this connection, SEAFDEC was requested to continue supporting Myanmar in the promotion of the EAFM concept in the whole country.

14. The Program Committee Member for Thailand also expressed the appreciation to SEAFDEC for its continued effort to promote human resource development, specifically by providing EAFM training and TOTs to more than 100 officers of the DOF Thailand, as this has enabled the trained officers to apply the

EAFM concept in several learning sites in the country. He also expressed the gratitude to SEAFDEC for supporting the EAFM activities in Krabi Province, and looked forward to receiving the continued support from SEAFDEC on EAFM.

15. The Program Committee Member for Lao PDR also expressed the appreciation to SEAFDEC for supporting the conduct of activities in the project learning sites in Lao PDR. He also requested SEAFDEC to expand the activities to the other areas of Lao PDR in the future.

(2) Optimizing Energy Use/Improving Safety Onboard in Fishing Activities

16. The 42PCM took note of the achievements of the project which would be completed in 2019, and would be continued under a new project that would start in 2020, as presented by the representative from TD.

17. During the discussion, the Program Committee Member for Thailand expressed the appreciation to SEAFDEC for sharing its expertise in the modification of purse seine fishing vessel in Pattani Province in collaboration with the DOF Thailand, as this has led to the reduction of the number of fishing crew onboard by 40% and ice consumption by 70%. The project also facilitated the development of technology for improving the quality of fish onboard purse seine fishing vessels.

18. The view expressed by the Program Committee Member for the Philippines that results from the activities of this project, particularly the purse seine vessel modification should be packaged into an information material that could be disseminated for the benefit the other Member Countries, was supported by the Program Committee Members for Indonesia and Malaysia as well as the Chief of MFRDMD. In this connection, the representative from TD reiterated that the project results are already available for downloading from the website of TD.

19. The Chief of MFRDMD expressed the concern on fuel efficiency of fishing vessels considering that 60% of the operating costs for fishing operation especially for longline, is attributed to fuel use. In this connection, the representative from TD explained that in the purse seine modification activity, the data on costs and returns were compiled and analyzed, and the results showed that the modification had reduced not only fuel consumption but also human labor onboard, and that the modification costs could be recovered within one and a half years only.

(3) Promotion of Sustainable Fishery Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia

20. The 42PCM noted the completion of the project in 2019 and that SEAFDEC is planning to continue to carry out the activities on resource enhancement under the new project starting 2020, as presented by the representative from TD.

21. In the ensuing discussion, the Program Committee Member for Indonesia expressed the appreciation to the Japanese Trust Fund (JTF) for supporting the implementation of the project and inquired about the possibility of continuing some of the activities, *e.g.* making use of the data generated by the project to come up with a map of important fishing grounds and critical habitats of the region, and establishing pilot sites to determine the benefits of this project to the region. He added that these could serve as platform for sharing of information and development of bank of knowledge for SEAFDEC. He also encouraged the participation of SEAFDEC in relevant international meetings to present its resource enhancement initiatives.

22. The Program Committee Member for the Philippines reiterated the expected outputs of the project, which could include the development of a map of important fishing grounds and critical habitats as well as the associated species, conduct of regional training programs, and publication of relevant materials. He also supported the view of the Program Committee Member for Indonesia that SEAFDEC should create the platform for sharing the lessons learned from initiatives undertaken by the Member Countries.

23. In responding to the concerns raised by the Members of the Program Committee, the representative from TD considered the possibility of developing a map of important fishing grounds based on the data collected through the SEAFDEC programs and network of researchers, although this would not be an easy task as the said map would cover not only the coastal fishing grounds but also the offshore areas. As for the future activities on resource enhancement, he suggested that these could be confirmed through a meeting among the Member Countries which would be organized under the new project in 2020. Moreover, considering the considerable number of databases developed by TD, these could be used to facilitate the sharing of data from the various programs and projects of SEAFDEC, and the same platform could also be used to facilitate the sharing of information on resource enhancement initiatives.

24. In responding to the query of the Chief of AQD on whether this project would be able to come up with protocols for the rehabilitation of depleted stocks of different wild species, *e.g.* blue swimming crab, dog conch, and others, the representative from TD explained that the fisheries resource enhancement activities of TD are not only science-based but are also meant to integrate co-management using various tools and emphasize on the importance of awareness-building activities, however, the protocols for stock enhancement would vary in the different areas. He therefore expressed the view that future activities on resource enhancement of TD could be undertaken in close cooperation with AQD to mobilize the technologies on seed production that had been developed.

(4) Enhancement of the Sustainability of Catadromous Eel Resources in Southeast Asia

25. The 42PCM noted the progress and achievements of this project which would be completed in 2019, while some activities would be continued under a new project starting 2020, as presented by the representative from IFRDMD.

26. During the discussion, the Program Committee Member for the Philippines expressed the appreciation to SEAFDEC and to the JTF for supporting the implementation of project activities in pilot sites in the Philippines, as this had enabled the country to obtain better understanding of the status of its anguillid eel resources. He then requested SEAFDEC to continue supporting the Philippines in improving the data collection and management of this important fishery resource. Furthermore, he also commended SEAFDEC for developing the Policy Guidelines for Conservation and Management of Tropical Anguillid Eels in Southeast Asian Region, which is still being reviewed through the ASEAN mechanism for possible adoption in the region.

27. The Program Committee Member for Myanmar also commended SEAFDEC through the project, for conducting surveys in pilot sites in Myanmar as these had generated information on the species and distribution of tropical anguillid eels in the country. She added that the country would continue to collect statistical data on anguillid eels, and also expressed the support of Myanmar to the Policy Guidelines for Conservation and Management of Tropical Anguillid Eels in Southeast Asian Region.

(5) Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia

28. The 42PCM took note of the achievements of this project, which would be completed in 2019 as presented by the representative from IFRDMD, while some activities would be continued under a new project starting 2020.

(6) Promotion of Countermeasures to Reduce IUU Fishing Activities

29. The 42PCM noted the achievements of this project which would be completed in 2019, while some activities would be continued under a new project starting 2020, as presented by the representative from TD.

30. While sharing the view on the importance of this project, the Program Committee Member for Singapore expressed the appreciation to TD and the JTF for supporting the activities on combating IUU fishing in the region.

31. The Program Committee Member for Thailand expressed the support to the development of the RFVR for fishing vessels 24 meters in length and over as it complements the requirements of the Global Record of Fishing Vessels, Refrigerated Transport Vessels and Supply Vessels (Global Record). Moreover, in order to generate information that could be more useful for the Member Countries, the

representative from Thailand also suggested that SEAFDEC may consider synthesizing the data in the RFVR Database. In response to the query about the availability of the formula for conversion of the units used by other countries (e.g., gross tonnage, horsepower, among others) to length overall (LOA) so that the data could be easily inputted to the RFVR Database, the representative from TD explained that TD had already harmonized and converted the various measurements of fishing vessels into LOA, and currently the AMSs have been using such procedure.

32. While commending TD for the updates provided on the project, the Program Committee Member for Myanmar stated that the DOF Myanmar has strengthened its collaboration with TD on the RFVR Database by providing the updated data, and the latest update would be transmitted in December 2019. With regards to the Port State Measures Agreement (PSMA) which Myanmar has already ratified, Myanmar has made progress in conducting several activities and utilizing the tools to cope with the requirements of PSMA, including the establishment of VMS, MCS system, which would be pilot tested in the country in December 2019.

33. Considering that TD has exerted much effort in establishing and updating the data in the RFVR Database for vessels 24 meters in length and over, the representative from SEAFDEC Secretariat expressed the concern on the low utilization of the Database by the AMSs. He therefore sought the views of the AMSs on how the usefulness of the RFVR could be enhanced, as well as on the proposed establishment of a new database for vessels less than 24 meters in length.

34. With regards to the usefulness of the RFVR Database, the representative from TD added that the RFVR Database comprises 28 information items that were considered essential during the consultation with AMSs. During the initial establishment of the RFVR, it was noted that several fishing vessels were landing their catch in the ports of other countries. Recently, however, landing of catch by fishing vessels particularly those larger than 24 meters in another country's port is already prohibited, while only carrier vessels are allowed to land their catch. Therefore, the RFVR Database could still be useful for carrier vessels, and also for vessels less than 24 meters that still land their catch across the borders of neighboring countries.

35. While emphasizing on the need to also manage fishing vessels less than 24 meters in length as this range represents the majority of small-scale fishing vessels in the region, the Program Committee Member for Indonesia expressed the difficulties that could be encountered in collecting the data due to a large number of small fishing vessels in the region. He therefore encouraged TD to find the ways of improving the existing RFVR Database prior to expanding the database to cover small fishing vessels, and to take into account the relevant economic, livelihood, and political considerations in designing the specific activities in the future.

36. While encouraging the Member Countries to share their views on the usefulness of the RFVR Database in support to the countries' efforts in combating IUU fishing, the SEAFDEC Secretary-General suggested that if TD would develop the Database for vessels less than 24 meters in length, the appropriate approach for inputting the necessary data, for example by importing the data from the countries' databases, would be considered taking into account the large number of small-scale fishing vessels in the region.

(7) Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand

37. The 42PCM took note of the achievements of this project which would be continued beyond 2019, as presented by the representative from the Project.

38. In the discussion, the Chief of MFRDMD expressed the concern on the recent reduction of the squid (*Loligo chinensis*) resources in the South China Sea and suggested that this project should consider incorporating the establishment of *refugia* sites and development of management measures toward the sustainability of the species as well as for other species that are economically important for the Southeast Asian region.

39. The Program Committee Member for Thailand commended SEAFDEC for providing the platform for the sharing of data on Indo-Pacific mackerel among the countries in the Gulf of Thailand sub-region, as this has facilitated the identification of the linkage of the mackerel resources between Thailand and Cambodia as well as with those in Malaysia and Indonesia.

40. The Program Committee Member for the Philippines, while reiterating the gratitude for having the Philippines as one of the participating countries of this project and recognizing the importance of the project results which include science-based management of fishing capacity, stated that the project objectives are specific and clear, such as reduction in fishing pressure within the sites that are critical to the life cycles of fished species that are transboundary in nature by about 50%, and increase of about 20% in the number of small-scale fishing vessels using fishing gear and practices designed to safeguard the fish stocks and critical habitats at priority sites. In response to the suggestion that the project should ensure the connection of the objectives, outcomes, outputs, and activities in the logical framework, the representative from TD assured the 42PCM that the logical framework was developed prior to the start of the project, including with the activities, both regional and national, for the six participating countries.

(8) Offshore Fisheries Resources Exploration in Southeast Asia

41. The 42PCM noted the progress and achievements of the project which would be completed in 2019, as presented by the representative from TD.

42. In the discussion, the Program Committee Member for the Philippines commended SEAFDEC for undertaking this project as this has been instrumental in exploring the underutilized resources that have the potentials for utilization in the future, specifically the deepsea shrimps. He added that some fisheries industries in the Philippines had recently expressed their intention to utilize such resources. Furthermore, he also emphasized on the need for SEAFDEC to continue providing capacity building to the Member Countries on stock assessment, but expressed the concern that several activities not relevant to the objectives of this project had been carried out. Although such activities could be useful for the countries in the region, he suggested that in the future development of project documents, SEAFDEC should make sure that the titles reflect the actual activities being proposed.

(9) Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in the Southeast Asian Region

43. The 42PCM took note of the implementation of two activities under this project which would be completed in 2019, as presented by the representatives from TD: 1) Improving the Data Collection of the Commercially-exploited Aquatic and Threatened Species implemented by TD in collaboration with MFRDMD; and 2) Facilitating Fisheries Activity Information Gathering through Introduction of Community-based Resources Management/Co-management implemented by TD.

(10) Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region

44. The 42PCM noted the achievements of the project which would be completed in 2019, as presented by the representative from MFRDMD.

45. While the representative from Thailand appreciated the efforts of MFRDMD for implementing the project, she indicated that modification of fishing gears had occurred during the data collection throughout the past years, and therefore expressed the concern that this could lead to certain biases in the data analysis as well as in coming up with information on the trend of the purse seine catch. With regards to the result of the comparative study conducted by MFRDMD which showed that the overall catch of the purse seine fisheries in the region should be reduced by 25% based on the data analyzed from 1996 to 2015, she also expressed the concern that this recommendation might not be applicable due to the multi-species nature of fisheries in the region. In this connection, the Program Committee Member for Indonesia also suggested that the project should consider finding the alternative solutions for appropriate management measures for purse seine fisheries in the region which should not be based only on output control such as catch limit, but also input control as well as technical control.

46. The representative from Indonesia highlighted on the issues about the quality and uncertainty of the data collected and used in the analysis during the period of the project implementation, and suggested that the future activities of the project could consider improving the accuracy of calculated catch per unit effort (CPUE). With regards to the recommendation to set up a quota system for purse seine fisheries in the region, he proposed for the adoption of other management measures instead, *e.g.* effort control, closed area, and closed season, taking into account the lessons learnt from the Philippines on the management of the country's sardine and other small pelagic resources.

He added that another method of data analysis using the same dataset collected by the project could be carried out to be able to include the range of uncertainties, and compare and understand the results.

(11) Research for the Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region

47. The 42PCM noted of the progress and major achievements of the project which would be completed in 2019, with some activities to be continued under a new project starting 2020, as presented by the representative from MFRDMD.

(12) Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia

48. The 42PCM took note of the progress and achievements of the project which would be completed in 2019 with some activities to be continued under a new project starting 2020, as presented by the representative from the SEAFDEC Secretariat.

49. During the discussion, the Program Committee Member for the Philippines suggested that all projects related to anguillid eels that are implemented by SEAFDEC should be combined and presented as a group. In this connection, the representative from SEAFDEC Secretariat clarified that the project implementation presented at the PCM is generally according to the source of budget. However, SEAFDEC is trying its best to group the activities which has the same target species into one program presentation.

50. In responding to the query of MFRDMD about the need to report the most significant outputs from the project implementation, it was clarified that the dataset and information package developed through the project implementation are available at the project's website.

(13) SEAFDEC-EU/CITES Sharks Project Phase II

51. The 42PCM took note the activities and completion of the project in 2019 as presented by the representative from the SEAFDEC Secretariat.

(14) Strengthening the Effective Management Scheme with GIS (Geographic Information System) and RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture in the AMS

52. The 42PCM noted the progress of the project which will be continued until mid 2020, as presented by the representative from the SEAFDEC Secretariat.

53. In the discussion, the Program Committee Member for Thailand expressed the view that while the project has provided financial support to local fishers to collect data, the capacity of the fisheries officers of the Department of Fisheries (DOF) of Thailand could also be enhanced to be able to collect information on fishing gears and their catch, as well as long-term landing data. In this regard, SEAFDEC was requested to consider extending support to Thailand through the conduct of training programs for concerned officers from the DOF of Thailand.

3.1.2 Strategy II: Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region

(15) Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources

54. The Program Committee took note of the achievements of the project which would be completed in 2019, while some activities would be continued under a new project starting 2020, as presented by the representative from AQD.

55. During the discussion, the Program Committee Member for Brunei Darussalam congratulated SEAFDEC for the project achievements and expressed the view that most of the ongoing projects of SEAFDEC focused on capture fisheries while only a few deals with aquaculture. He then suggested that SEAFDEC should consider implementing more activities on aquaculture in the future considering its

potential benefits to poverty alleviation and improved livelihood of people in the fisheries communities. With regards to the activities on fishmeal replacement which currently focused on feeds for tilapia, he suggested that AQD should also consider undertaking studies on fishmeal replacement for feeds of marine species, e.g. sea bass and grouper.

56. In response to the comment of the Program Committee Member for Brunei Darussalam, the Chief of AQD explained that after the completion of this project in 2019, AQD would propose a new project to be supported by the Department funds, but focusing on the priorities of the Philippines as the host country of AQD. With regards to fish meal replacement, although the current study of AQD focuses on tilapia which is a freshwater species, the alternative ingredients being studied could also be adapted for marine species.

(16) Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region

57. The 42PCM took note of the achievements of the project which is scheduled to be completed in 2019 while some activities would be continued under a new project starting 2020, as presented by the representative from AQD.

58. During the discussion, the Program Committee Member for Myanmar indicated that the country is planning to conduct on-site training on basic fish bacteriology, antimicrobial assay, and disinfection techniques through the MYSAP-GIZ Programme from November 2019 to 2020 and that Myanmar is in the process of developing the contents of the said training course.

3.1.3 Strategy III: Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region

(17) Chemicals and Drug Residues in Fish and Fish Products in Southeast Asia- Biotoxins (ASP, AZA and BTX) and Harmful Algal Blooms (HABs) in the ASEAN Region

59. The 42PCM took note of the achievements of the project, which would be completed in 2019, as presented by the Chief of MFRD.

3.1.4 Strategy IV :Enhancing trade and compliance of the region's fish and fishery products with market requirements

(18) Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products

60. The 42PCM noted the achievements of the project, which would be completed in 2019, while some activities would be continued under a new project starting 2020, as presented by the representative from MFRDMD.

3.1.5 Strategy V: Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries

(19) Assistance for Capacity Building in the Region to Address International Fisheries-related Issues

61. The 42PCM took note of the achievements of the project which would be completed in 2019, while some activities would be continued under a new project starting 2020, as presented by the representative from the SEAFDEC Secretariat.

62. The Program Committee Member for Brunei Darussalam commended SEAFDEC for undertaking the activities in collaboration with the SEAFDEC-Sweden Project that supported the development of the electronic ACDS (eACDS) which was pilot tested in Brunei Darussalam. He specifically expressed the appreciation to SEAFDEC for supporting the development of the offline system of the eACDS using the Android mobile application. He added that Brunei Darussalam is planning to organize a commercial-scale ACDS training at the later part of November 2019.

3.1.6 Strategy VI: Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries

(20) Fisheries Resource Survey and Operational Plan for the M.V. SEAFDEC 2

63. The 42PCM noted the progress and achievements of the project which would be continued beyond 2019, as presented by the representative from TD. It was further noted that Malaysia has a plan to utilize M.V. SEAFDEC 2 in 2021 and is in the midst of developing the details.

64. In the discussion, the Program Committee Member for the Philippines requested SEAFDEC through TD to support the conduct of a hydroacoustic survey of fishing grounds of the Philippines and distribution of biomass of small pelagic fishes, taking into consideration the existing expertise and equipment in SEAFDEC and the Member Countries, and requested that the survey be carried out in 2020. He also proposed to discuss the details of the activity with TD, especially on the cost-sharing arrangement for the survey.

65. In response, the representative from TD indicated that SEAFDEC would collaborate with BFAR and the National Fisheries Research and Development Institute (NFRDI) of the Philippines for the detailed arrangements and cost-sharing aspect of the survey. As for the suggestion of the Program Committee Member for Myanmar, the M.V. SEAFDEC 2 could support the fisheries resources survey in the shallow waters and coastal areas that are beyond the survey plan of the R.V. Dr. Fridtjof Nansen. TD could also provide support to build up the capacity of the concerned officers to conduct the survey in the waters of Myanmar through a SEAFDEC Project in 2020-2024.

66. While thanking SEAFDEC for the support extended to the Member Countries in conducting resource surveys using the M.V. SEAFDEC 2, the representative from Thailand mentioned that another new project, the Bay of Bengal Large Marine Ecosystem (BOBLME) Phase II, would start in 2020 and support the joint R.V. Dr. Fridtjof Nansen survey in the BOBLME area of Myanmar and Thailand. She therefore proposed that in order to gain knowledge from the survey, and in particular on marine debris, SEAFDEC could also cooperate with the survey. She also suggested that SEAFDEC could consider the possibility of sharing the information obtained from the surveys using the R.V. Dr. Fridtjof Nansen and the M.V. SEAFDEC 2 that would be useful for the participating countries. In response, the representative from TD suggested that Thailand could also consider collaborating with SEAFDEC and the Institute of Marine Research of Norway in this aspect.

67. The Program Committee Member for Myanmar also expressed the interest of Myanmar to conduct a survey in its waters at 20 meters depth using the M.V. SEAFDEC 2, but the Government of Myanmar has limited budget to support such a survey. She also mentioned that the DOF Myanmar conducted surveys in 1974, 1980, 2013, 2015, and 2018 using the R.V. Dr. Fridtjof Nansen which were funded by FAO and Norway, and that the survey data in 2018 would be published in December 2019.

68. The Chief of MFRDMD also mentioned that MFRDMD will organize a workshop on acoustic data analysis on 25-27 November 2019 and that resource persons from Japan and Korea have been invited to the Workshop. He added that invitation letters have already been sent to Cambodia, Viet Nam, Thailand, and Indonesia, and that MFRDMD is still waiting for the nominations from these countries. He also indicated that the invitation letter would also be sent to the Philippines to take part in the Workshop.

69. While thanking MFRDMD for extending the invitation for the Philippines to participate in the said workshop, the Program Committee Member for the Philippines maintained that SEAFDEC could consider extending the support to the Philippines, on the conduct of acoustic survey for the country to obtain hands-on experience.

70. The representative from TD recalled the previous discussion between SEAFDEC and the Member Countries, and reported at the 42PCM that for the next five years, marine fisheries resources survey would make use of mid-water trawl and hydroacoustic equipment. In this connection and as recommended by the Chief of MFRDMD during the Fifty-first Meeting of the SEAFDEC Council, SEAFDEC should consider acquiring a new scientific echo-sounder that could be used during the surveys of the waters of the Southeast Asian countries.

(21) Strengthening SEAFDEC Network for Sustainable Fisheries

71. The 42PCM took note of the activities and achievements of the project, which would be completed in 2019, while some activities would be continued under a new project starting 2020, as presented by the representative from the SEAFDEC Secretariat.

3.1.7 Special Projects

(22) Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia

72. The 42PCM noted the achievements of the SEAFDEC-Sweden Project, which would be completed in 2019, as presented by the representative from the SEAFDEC Secretariat. While noting that the project has introduced several new approaches such as sub-regional collaboration for fisheries management, the representative from FAO/RAP indicated that such sub-regional approach would be continued under the projects which are being formulated by FAO, *e.g.* Promoting the Blue Economy of the Gulf of Thailand through the Ecosystem Approach to Fisheries Management (GoTFish).

73. The 42PCM also took note of the plan to submit the “Regional Action Plan for Management of Transboundary Species: Indo-Pacific Mackerel in the Gulf of Thailand Sub-region” developed under the SEAFDEC-Sweden Project in collaboration with the Fisheries *Refugia* Project through consultation with countries, namely: Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Viet Nam, for consideration of the SEAFDEC Council as well as the possibility of submitting the Regional Action Plan for endorsement by the ASEAN.

(23) The Oceans and Fisheries Partnership (USAID Oceans)

74. The 42PCM noted the achievements of this project which would be completed in May 2020, as presented by the Chief of Party of the USAID Oceans.

75. During the discussion, the Program Committee Member for the Philippines expressed the appreciation to USAID for the support extended to the USAID Oceans and SEAFDEC as the project regional partner, for the conduct of activities in General Santos, Philippines as one of the project learning sites. Although the activities in General Santos focused mainly on tunas, the Philippines is now ready to replicate the experiences from this project to other fisheries of the country. He added that on the development of EAFM plans in addition to the EAFM plan for Sulu-Sulawesi Seas sub-region, the Philippines is establishing the EAFM Plan for Sarangani Bay in Southern Philippines and will continue to support the EAFM plan for its Fisheries Management Area-3 (FMA-3). He then expressed the willingness of the Philippines to work with SEAFDEC projects of similar nature or with USAID in the future.

76. The Program Committee Member for Thailand also expressed the gratitude to the USAID Oceans for supporting the activities that aim to improve the supply chain and traceability system in Thailand, and added that the USAID Oceans conducted the Gap Analysis Workshop of the Fisheries Supply Chain and Traceability System on 31 October 2019 in Bangkok, Thailand. Through the Workshop, the fisheries officers, representatives from the private sector, and relevant stakeholders had obtained better understanding of the need to enhance the traceability of fish and fishery products of the country.

77. As the USAID Oceans is approaching its final stage of implementation and its activities would be completed in May 2020, the SEAFDEC Secretary-General expressed the appreciation to USAID for supporting the activities that enhance the traceability of fish and fishery products of the region throughout the five year span of the project implementation.

3.1.8 New Proposed Projects for the Year 2020

78. While considering the new proposed projects that would start in 2020 (**Annex 5**), the 42PCM provided comments and recommendations for the improvement of the projects and agreed to endorse the proposed projects to the SEAFDEC Council and to the higher authorities of the ASEAN for approval, taking into consideration the recommendations of the 42PCM.

(1) Strengthening a Regional Cooperation and Enhancing National Capacities to Eliminate IUU Fishing in Southeast Asia

79. In supporting the project which was proposed by the representative from TD, the 42PCM endorsed the project and also agreed on its implementation starting 2020.

80. During the discussion, the Program Committee Member for Brunei Darussalam supported the development of the RFVR Database for vessels less than 24 meters in length, as well as the implementation of port State measures (PSM) in the country, even if Brunei Darussalam is not yet a Party to the PSMA. He added that after the pilot testing of the implementation of eACDS in Brunei Darussalam, wider application of the eACDS should be promoted in the region in order that similar documentation schemes would be adopted among the AMSs.

81. The Program Committee Member for Myanmar also supported the promotion of eACDS as this has led to reduced trade of fish and fishery products from IUU fishing activities. In the case of Myanmar, two landing sites have been designated to improve the reporting system of IUU fishing activities, including those gathered from the VMS installed in fishing vessels. In this connection, she expressed the commitment of Myanmar to share its updated fishing vessel data with the RFVR Database and also encouraged the project to consider fostering closer collaboration with the private sector in the implementation of the activities.

82. While supporting the continuation of the project implementation, the Program Committee Member for Thailand focused on the importance of strengthening the cooperation among the AMSs in sharing of information and setting up of a network for combating IUU fishing in the region.

83. The Program Committee Member for Indonesia expressed the appreciation to the JTF for the continued support to SEAFDEC initiatives in combating IUU fishing, and shared the view on the needs of the AMSs for this project, and suggested that use of terminologies should be consistent, *e.g.* using “combat” rather than “eliminate” as the latter term denotes achieving “zero” IUU fishing. He also expressed the support for the conduct of training courses on PSM implementation and suggested that these should be conducted more frequently such as twice a year to ensure that considerable number of officers in the region could be trained. With regards to the RFVR Database, he suggested that improvement of the database should be carried out to ensure that it could support the monitoring, control, and surveillance (MCS) implementation in the future.

84. The Program Committee Member for the Philippines supported the need to continue the activities to enhance the capacity of AMSs in combating IUU fishing through the use of RFVR Database, strengthening PSM implementation, and promoting development and implementation of the eACDS. While expressing the difficulty in reviewing the project document, he suggested that SEAFDEC projects should have specific, measurable, achievable, realistic, and timely (SMART) objectives as well as corresponding clear indications of project outputs, outcomes, and long-term impacts. He added that SEAFDEC could also consider establishing a mechanism for the monitoring and evaluation of the project implementation.

85. While reiterating the importance of the project in combating IUU fishing in Cambodia, the Program Committee Member for Cambodia mentioned that the country has recently completed the fishing vessel census, and the data on vessels 24 meters in length and over is now available and could be shared with the other AMSs. With regards to the proposed RFVR Database for vessels less than 24 meters in length, he suggested that the specific range of the length should be determined, *e.g.* 18-24 meters. As Cambodia has recently become a Party to the PSMA, he looked forward to receiving assistance from SEAFDEC on the development and implementation of the eACDS in pilot sites in Koh Kong as well as for the activities on capacity building of fisheries officers for the implementation of PSMA.

86. The Program Committee Member for Thailand expressed the support to the RFVR Database and suggested that SEAFDEC could consider analyzing the information similar to that of the fishery statistics as this could facilitate better understanding of the Database by the AMSs. With regards to the eACDS, after the system is implemented in several countries, SEAFDEC should also consider establishing the links for the sharing of the data among the AMSs.

87. In response to the aforesaid recommendations, the representative from TD explained that TD would consult with the JTF on the extent of the recommendations including those on the use of terminology as suggested by Indonesia that could be accommodated by the new project. As for the possibility of conducting more frequent training on PSM, this would be discussed with relevant collaborating organizations, *e.g.* DOF of Thailand, NOAA, FAO, that provide resource persons for such training and also taking into account the availability of project funds. With regards to the RFVR Database for vessels 24 meters in length and over, this would be improved and updated in parallel with the development of the new RFVR database for vessels less than 24 meters in length. The appropriate range of the size of vessels as well as the analysis of data from the RFVR Database would be discussed with the Member Countries during the Meeting to be organized in 2020. However, close cooperation with all AMSs is crucial for the implementation of this project.

(2) Harmonization and Enhancing Utilization of Fishery Statistics and Information

88. The 42PCM considered the planned activities of the project as proposed by the representative from the SEAFDEC Secretariat, and agreed to endorse the project and support its implementation starting from 2020.

89. In response to the concerns raised by the representative from FAO/RAP, the representative from the SEAFDEC Secretariat clarified that in the process of revising the Regional Framework for Fishery Statistics of Southeast Asia, the collection of sex-disaggregated statistics on fishers and fish farmers would be discussed with the Member Countries during the RTC to be organized in 2020, considering that the statistics questionnaire used by SEAFDEC would be harmonized with that of FAO.

90. The Program Committee Member for Thailand commended SEAFDEC for the preparation of the publication “Southeast Asian State of Fisheries and Aquaculture (SEASOFIA)” as this has provided useful information to the Member Countries, and reiterated the importance of collecting the data and statistics on species under regional concern, such as neritic tunas, Indo-Pacific mackerel, and other transboundary species as this would support the conduct of stock assessment and estimation for the level of the maximum sustainable yield (MSY). In this regard, the AMSs were also encouraged to report to SEAFDEC their respective fishery statistics at the species level.

91. While agreeing with the view of the Program Committee Member for Thailand regarding the fisheries statistics compiled by SEAFDEC which could be utilized for the stock assessment of transboundary species, the Chief of MFRDMD reiterated the importance of the availability and accuracy of the data and encouraged all AMSs to upgrade their respective fisheries statistical systems.

92. In response to the view of MFRDMD, the Program Committee Member for Indonesia also suggested that more detailed technical discussion among the AMSs would be necessary to come up with reliable data (*e.g.* data on the fishing operation, port inspection, logbook, logsheet, landing, and others) which could be used for CPUE calculation and stock assessment as well as for the development of harvest strategy and management strategy evaluation. As for the SEASOFIA which has been published every five years while the State of Fisheries and Aquaculture (SOFIA) is produced by FAO every two years, SEAFDEC was asked to consider harmonizing the timeline between SOFIA and SEASOFIA, *e.g.* publishing SEASOFIA every two or four years.

93. The Program Committee for the Philippines also informed the Meeting that the collection of fishery statistics in the Philippines is carried out by another agency and not by BFAR. In this regard, he requested that invitations by SEAFDEC to attend the RTC on fishery statistics should also be extended to such agency which is responsible for fishery statistics in the Philippines.

94. In response to the concerns raised by the 42PCM, the representative from the SEAFDEC Secretariat explained that the statistics questionnaires of SEAFDEC require the AMSs to include the statistics at species level. However, only a few countries could report the data at such level. As for the schedule for the publication of the SEASOFIA every five years, it is based on the directive of the SEAFDEC Council and changing the publication schedule would be subject to the consideration of the Council.

(3) Responsible Fishing Technology and Practices

95. In endorsing the project as proposed by the representative from TD, the 42PCM also supported the implementation of the project to start from 2020.

96. While expressing support to the project, the Program Committee Member for Lao PDR requested SEAFDEC to include the development of responsible fishing technologies and practices for inland fisheries under this project.

97. The Program Committee Member for Malaysia, while commending TD for coming up with helpful activities under the project, requested TD to consider supporting the AMSs in the implementation of the FAO Voluntary Guidelines on the Marking of Fishing Gear, considering that the Guidelines has already been promoted by FAO.

98. The Program Committee Member for Indonesia informed the Meeting that Indonesia has already banned all kinds of trawl operations in its waters, and commended TD for the project on reducing the negative impacts of trawl operations on the environment. He also shared the view of Malaysia for SEAFDEC to consider supporting the implementation of the FAO Voluntary Guidelines on Marking of Fishing Gear. In this connection, he mentioned that FAO has supported Indonesia in pilot testing of the tracking tools for lost gears (*i.e.* small-scale gillnets) and such tools could also be applied for tracking lost gillnets and other gears used by small-scale fishers.

99. The 42PCM was also informed that Indonesia has conducted a pilot study on the implementation of the Guidelines involving small-scale fishers to address the concern on lost gears that leads to ghost fishing, marine pollution, and habitat destruction. He added that there is a need to raise the awareness of stakeholders in preventing and retrieving lost gears. He therefore suggested that cooperation with other sectors would be necessary for the recycling/reusing of old gears so that these would not be discarded and create negative impacts to the environment. Furthermore, he suggested that the project should also include activities on the appropriate use of machinery in small-scale fisheries to minimize fuel consumption and leakage from fishing vessels.

100. The Program Committee Member for Thailand also supported the activities on good fishing practices particularly reducing the negative impacts of trawl fishing to the environment as well as on reduction of discards and bycatch. On the suggestion to support the implementation of the FAO Voluntary Guidelines on the Marking of Fishing Gear, SEAFDEC was requested to consider organizing an experts' workshop on proper marking of different types of gear, particularly trawls and gillnets. Moreover, the 42PCM was also informed about the scheme undertaken by the DOF of Thailand in collaboration with fisheries associations and the private sectors, to reduce old fishing gears and trash at sea by requesting fishers to collect lost gears and trash at sea, and report such activities in the social media. She also suggested that SEAFDEC could consider incorporating in the project, additional activities such as reducing of fuel consumption, enhancing safety at sea, reducing of carbon emission, and improving of onboard fish handling using chilled seawater and salt.

101. While expressing support to the project, the Program Committee Member for Cambodia expressed the concern on some fishing gears that negatively impact on the fishery resources, such as collapsible traps and trawls with small mesh size at the codend. He also requested TD to conduct a pilot study or extension activity on the impacts of such gears as well as share the results from relevant studies undertaken in the past, with the fishers as well as law enforcers.

102. While appreciating the comments and recommendations of the 42PCM, the representative from TD reiterated that a regional technical meeting would be organized by TD in early 2020 to identify the priority activities to be implemented under this project, and would request the Member Countries to send their respective experts on fishing gear technology to attend the meeting. In responding to the request of Cambodia, TD would send the results of the studies undertaken by SEAFDEC on trawl selectivity during the past 10 years for reference.

(4) Enhancing Food Safety and Competitiveness of Seafood Products

103. While considering the new project as proposed by the Chief of MFRD, the 42PCM endorsed and supported the implementation of the project starting from 2020.

104. During the discussion, the Program Committee Member for Japan supported the project and suggested that a Japanese expert could be involved in the implementation of the project considering his long experience in one of major seafood companies in Japan.

105. The Program Committee Member for the Philippines also expressed the support to this new project especially in the development of standards for GMP and GHP as these could help enhance the safety and competitiveness of seafood products from the region. He also requested SEAFDEC to consider addressing the issues on the seafood marketability as part of competitiveness objective of the project.

(5) Assistance for Capacity Development in the Region to Address International Fisheries-related Issues

106. In supporting the project as proposed by the representative from the SEAFDEC Secretariat, the 42PCM endorsed the project for implementation starting from 2020.

107. Specifically while expressing support to the project, the Program Committee Member for Indonesia extended the appreciation to the Government of Japan for the continued support to the activities that aim to address international fisheries-related issues to safeguard the fisheries sector of the region.

(6) Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region

108. The 42PCM endorsed the project for implementation in 2020 as proposed by the representative from MFRDMD.

109. While expressing the support to the implementation of this new project, the Program Committee Member for Indonesia mentioned that the project is not only concerned with CITES but also with relevant RFMOs that have SEAFDEC Member Countries as members, as the results from this project could be reported by the respective countries to the concerned RFMOs. Moreover, he also suggested that in addition to stock assessment, the project could also consider including risk assessment for selected shark species as well as making use of appropriate stock assessment models (*i.e.* data limited methods) considering the shark statistics data that are available in the region.

110. The Program Committee Member for Myanmar thanked MFRDMD for this project and stated that in the implementation of the previous SEAFDEC project including DNA studies on sharks and rays, Myanmar has enhanced its capacity in the taxonomic identification of sharks and rays. She then looked forward to having continued cooperation between Myanmar and MFRDMD under this new project.

111. The Program Committee Member for Malaysia also supported the new project and expressed the country's interest to be involved as one of the participating countries under the socio-economic component of the project.

(7) Sustainable Utilization of Anguillid Eels in the Southeast Asian Region

112. The 42PCM endorsed and supported the new project to be implemented in 2020 as presented by the representative from IFRDMD, and considered the requirements of the project implementation such as permission to conduct the sampling in participating countries and taking out of samples for genetic studies from the concerned countries.

113. In expressing the support to the implementation of the project, the Program Committee Member for Myanmar also thanked SEAFDEC and the JTF for including Myanmar in the project activities.

114. While supporting the implementation of the project, the Program Committee Member for the Philippines commended SEAFDEC for the clear and simple logical framework used for the development of the project as this has facilitated better understanding of the activities under the project.

(8) Sustainable Utilization of Fisheries Resources and Resources Enhancement in Southeast Asia

115. In supporting the project as proposed by the representative from TD, the 42PCM agreed to endorse the project and support its implementation starting from 2020.

116. In the discussion, the Program Committee Member for the Philippines commended SEAFDEC for developing the project with SMART objectives as well as activities that clearly correspond to the objectives, as this would facilitate the effective and efficient monitoring and evaluation of the project.

117. The Chief of AQD however expressed the concern that some activities proposed under the project on the management of marine fishery resources seem to duplicate the stock assessment activities undertaken by MFRDMD, and suggested that harmonizing the activities undertaken under different projects would be necessary. In response, the representative from TD explained that TD mainly focuses to conduct human resource development activities that will support the monitoring and update status of marine fisheries resources in Southeast Asia. TD will also closely work with MFRDMD to avoid the duplication of activities.

118. In a related development, the 42PCM was informed by the Chief of MFRDMD that the Asian Fisheries Acoustic Society (AFAS) is organizing its Annual Meeting on 11-13 November 2019 in Taiwan. Considering that the AFAS meetings discuss the issues relevant to stock assessment of small pelagic species, he encouraged the staff of SEAFDEC and the Member Countries to attend the future meetings of AFAS.

119. While expressing the support to the project, the Program Committee Member for Thailand requested TD to obtain data from the surveys conducted by the R.V. Dr. Fridtjof Nansen which could be useful to support the stock assessment activities of the region in the future. Moreover, SEAFDEC was also requested to consider the conduct of training for the staff of DOF of Thailand onboard the M.V. SEAFDEC 2 during its survey cruise, which could include training on fishing and marine engine operations.

(9) Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region

120. The 42PCM endorsed the project for implementation starting from 2020 as proposed by the representative from MFRDMD.

121. In responding to the concern of the Program Committee Member for Thailand on the stock assessment program for tonggol tuna of which Thailand was requested to provide its catch and effort data, and that such request may duplicate with this project, the representative from the SEAFDEC Secretariat clarified that a practical workshop is being planned by SEAFDEC to review the “Stock and Risk Assessment for Neritic Tunas: Longtail Tuna and Kawakawa.” Although this is not included in any program of work, it is meant to initiate a review of the stock assessment of these neritic tunas in order to keep momentum of the effort in strengthening the regional collaboration on management of transboundary species. This also builds upon the regional initiative of the SEAFDEC-Sweden Project which would be completed in 2019.

122. As for the objective of the Project which is to evaluate fisheries resources and sustainable management, the Program Committee Member Indonesia suggested that prior to the study, the project should compile the existing management measures for small pelagic species at national level when available. In addition, the study should also clarify and define the scoping of areas of the study, connectivity as well as the broad range of life history for selected species as this will affect the sampling strategy of this study. Also, there is a need to identify the capacity building needs for fishery managers to translate the scientific findings into policies.

123. In endorsing the proposed project, the Program Committee Member for the Philippines suggested that the project should consider the goal of promoting the sustainable utilization of pelagic resources taking into consideration its MSY level. He also suggested that the project should consider looking into the criteria for identifying the priority pelagic species that are economically important in the region. In this regard, the representative from MFRDMD clarified that the priority activities on pelagic species would be finalized during the regional meeting of the project in 2020.

124. For the consistency of the terminology used in the study, the Program Committee Member for Indonesia suggested that neritic tunas should be used instead of tuna. As a starting point, the study may conduct literature review of the existing information on stock status and biology for neritic tunas from the Working Party on Neritic Tunas of IOTC.

(10) Sustainable Aquaculture through Cost-Effective Culture Systems, and Prompt and Effective Aquatic Animal Health Management

125. In support of the project as proposed by the representative from AQD, the 42PCM endorsed the project and agreed to its implementation starting from 2020.

126. While supporting the proposed project, the Program Committee Member for Indonesia suggested that SEAFDEC could consider involving Indonesia in the capacity building related activities. He also proposed that activities on aquaculture of ornamental fishes and indigenous fish species, and marine aquaculture in floating cages should be accommodated in the project. In addition, the activities should adopt good aquaculture practices (GAqP) taking into account the optimum carrying capacity.

127. The Program Committee Member for the Philippines shared the views of the Program Committee Member for Indonesia, and also expressed the appreciation to the Japanese Trust Fund for sustaining its financial support to this project.

(11) Management Scheme for Inland Fisheries in the Southeast Asian Region

128. While supporting the project as proposed by the representative from IFRDMD, the 42PCM agreed to endorse the project for implementation starting from 2020.

129. While expressing the importance of the inland fisheries sub-sector in the Philippines as it contributes about 10% of the total fish production, the Program Committee Member for the Philippines requested SEAFDEC to include the Philippines as a learning site of the project.

130. While also supporting the proposed project, the Program Committee Member for Lao PDR suggested that SEAFDEC could consider involving Lao PDR in the project, in particular on the activity related to data collection and analysis.

131. The Program Committee Member for Thailand expressed the concern on the impact of climate change throughout the region and in particular in the Mekong River Basin, and requested IFRDMD to conduct a training course on data collection and stock assessment of inland fisheries for the compilation of baseline data on inland fisheries in the region.

132. While stressing on the importance of inland fisheries, the Program Committee Member for Myanmar emphasized that Myanmar had decentralized its inland fisheries to the regional state of Myanmar, and requested the support of SEAFDEC on the capacity building activities of the country, especially in the technical matters related to the management of inland fisheries.

(12) Small-scale Fisheries Management for Better Livelihood and Fisheries Resources

133. In considering the project proposed by the representative from TD, the 42PCM endorsed the project and supported its implementation starting from 2020.

134. During the discussion, the Program Committee Member for Indonesia proposed to co-organize with SEAFDEC the Workshop on Assessing the Needs of the AMS in Implementing the FAO SSF Guidelines with respect to market access. Proposed to be organized in Bali, Indonesia in February 2020, the Workshop is expected to come up with the “Regional Plan of Action on SSF to Market Access” not only to enhance sustainability but also fairness for small-scale fisheries.

135. The Program Committee Member for Thailand commended SEAFDEC for developing this project which focuses on the small-scale fisheries. As the adaptation of EAFM in Krabi Province has been successful, he requested SEAFDEC to also conduct EAFM in other pilot sites for inland areas.

136. While appreciating the adoption of the simplified logframe in the development of this project, the Program Committee Member for the Philippines reiterated that the EAFM plan is a crucial and important approach towards better management of shared resources, and this should involve not only small-scale but also commercial fisheries. He also added that the Philippines would like to be involved in this project in terms of sharing experiences from the implementation of the EAFM plan in the Philippines.

137. The Program Committee Member for Lao PDR also requested SEAFDEC to include Lao PDR in the project implementation, while the Program Committee Member for Myanmar supported the implementation of the project as it is crucial to Myanmar.

(13) Development of Stock Assessment Method for Strengthening of Resources Management Measures of Tropical Anguillid Eels in AMS

138. The 42PCM endorsed the project as proposed by the representative from the SEAFDEC Secretariat, and supported the implementation of the project starting from 2020.

139. During the discussion, the Program Committee Member for Brunei Darussalam suggested that stock status model for sustainable utilization of the tropical anguillid eels should be developed as this could be beneficial for the whole region.

3.2 Departmental Programs

140. While considering the progress and achievements from the implementation of the SEAFDEC Departmental Programs in 2019 and the proposed programs for 2020 (**Annex 6**), the 42PCM offered recommendations for the improvement of the programs and approved the proposed programs taking into consideration the aforesaid recommendations.

3.2.1 Aquaculture Department

141. The 42PCM took note of the progress and achievements of the Departmental Programs of AQD, namely: 1) Quality Seed for Sustainable Aquaculture; 2) Healthy and Wholesome Aquaculture; 3) Maintaining Environmental Integrity through Responsible Aquaculture; 4) Meeting Social and Economic Challenges in Aquaculture; 5) Adapting to Climate Change Impacts; and 6) Collaborative projects with the Philippine Government, and also approved the programs for implementation in 2020, as presented by the Chief of AQD.

142. In the discussion, the Program Committee Member for the Philippines appreciated the efforts of AQD in implementing the activities under its Departmental programs. Although these programs generally address the priorities of the Philippines, the results could be shared with and adapted by the other countries in the region in their efforts towards the sustainable development of aquaculture. He added that during the recent Philippine Technical Administrative Committee Meeting which reviewed the activities under the Departmental Programs of AQD, the Committee as well as the SEAFDEC Council Director for the Philippines commended AQD for undertaking numerous activities that support the aquaculture industry of the country. Nevertheless, the experience and technologies generated by AQD would also benefit the other SEAFDEC Member Countries.

143. The Program Committee Member for Thailand also commended AQD for implementing several activities under its Departmental Programs which are very useful not only for the Philippines but also for the entire Southeast Asian region. He then requested AQD to consider conducting training program that would transfer the knowledge and technologies to the other Member Countries in the future.

3.2.2 Training Department

144. While taking note of the progress and achievements of the Departmental Program of TD on the Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building, as presented by the representative from TD, the 42PCM also approved the activities for implementation in 2020.

145. For the Departmental Program of TD on the Improvement of Fisheries Technology and Reduction of the Impact from Fishing, which was reported by the representative from TD, the 42PCM endorsed the program and supported its implementation in 2020.

146. In responding to the suggestion of the Chief of MFRDMD to consider the participation of MFRDMD in the training in Japan on hydroacoustic research, especially on the use of scientific echosounder, the representative from TD would explore the possibility for MFRDMD to take part in the same training in the future.

3.2.3 Inland Fishery Resources Development and Management Department

147. The 42PCM was informed by the Chief of IFRDMD of the four Departmental Programs, namely: 1) Stock Assessment in Inland Fisheries; 2) Development of Capacity Building Plan to support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules and Conducting Training of Trainers on EAFM/EAA; 3) Improve livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence; and 4) Modernizing Irrigated Agriculture to Protect and Restore Aquatic Biodiversity and Ecosystem Services in Southeast Asia, and also supported the implementation of the departmental programs of IFRDMD in 2020.

148. In the discussion, the representative from the SEAFDEC Secretariat suggested that IFRDMD could consider collaborating with the other SEAFDEC Departments in the implementation of the activities under its Departmental Programs (*e.g.* stock assessment, EAFM, EAAM, among others). In this regard, the Chief of IFRDMD explained that IFRDMD has collaborated with TD and is planning to invite the concerned TD staff to participate in the Technical Meeting on Stock Assessment in Inland Fisheries and Training Course on EAFM/EAA which will be organized in 2020.

3.3 Other Programs

149. The 42PCM considered progress of implementation of Other Programs in 2019 and endorsed the corresponding activities for implementation in 2020.

(1) Implementing the Lower Mekong Fish Passage Initiative in Cambodia, Thailand, and Viet Nam

150. The 42PCM was informed by the representative from TD of the progress of the project implementation in 2019 and the proposed activities of the project in 2020 which would involve three countries, namely: Cambodia, Thailand, and Viet Nam (**Annex 7**).

151. In response to the query of the Chief of AQD about the nature of a fish passage, the representative from TD explained that fish passage is a cross-river structure installed in dams or weirs to regulate the water flow that would and enable the upstream and downstream migration of aquatic species.

152. While expressing appreciation for the construction of fish passage in Cambodia, the Program Committee Member for Cambodia informed the PCM that most of the weirs in Cambodia are within the height (water head) of 5 meters. Moreover, he raised the concern that the agency responsible for weir operation and construction of fish passage is the Ministry of Water Resource and Meteorology which is not involved in fisheries management. In this regard, he suggested that cooperation should be fostered among the relevant agencies to develop appropriate design and operation of fish passage to ensure the sustainability of inland fishery resources.

153. The Program Committee Member for Thailand also expressed appreciation to SEAFDEC for implementing activities on fish passage with support from the US-DOI and ACIAR, and also requested SEAFDEC to support the conduct of a study on seasonal migration of fish at selected pilot sites to obtain information that would be useful for management of inland fisheries.

IV. PIPELINE PROJECTS AND EMERGING NEEDS FOR PREPARATION OF FUTURE PROJECT PROPOSALS

4.1 ASEAN-JICA Projects

154. The representative from JICA informed the 42PCM that the two ASEAN-JICA projects, namely: 1) Food Value Chain Development Project; and 2) Capacity Building on IUU Fishing Countermeasures in Southeast Asia, are regional projects that open window for future cooperation between JICA and SEAFDEC after the previous cooperation between the two organizations had ceased several years ago. He therefore looked forward to obtaining the endorsement of the ASEAN –JICA collaborative projects by the SEAFDEC Program Committee. The documents appear in **Annex 8**.

(1) ASEAN-JICA Food Value Chain Development Project

155. The 42PCM took note and endorsed of the project “ASEAN-JICA Food Value Chain Development Project” as presented by the representative from the SEAFDEC Secretariat.

156. The Program Committee Member for Singapore expressed the appreciation to the SEAFDEC Secretariat for the proposed ASEAN-JICA project as it is particularly useful for conduct of food value chain studies in the region. He also expressed the willingness to collaborate in the implementation of activities through the MFRD Programmes.

157. The Program Committee Member for Indonesia, while expressing the support this project as it has already be endorsed by the SOM-AMAF and AMAF, also suggested that the project could consider including public-private partnership into the project activity.

(2) ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Countermeasures in Southeast Asia

158. The 42PCM also endorsed the project “ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Countermeasures in Southeast Asia”.

159. The Program Committee Member for Viet Nam expressed the appreciation to JICA and SEAFDEC for this project and requested that support would also be extended to Viet Nam for its efforts in combating IUU fishing.

4.2 Gender Dimension in the Value Chain of Small-scale Fisheries & Aquaculture in Southeast Asia

160. The 42PCM noted that the project proposal “Gender Dimension in the Value Chain of Small-scale Fisheries & Aquaculture in Southeast Asia” has been submitted to FAO for possible funding support, as presented by the representative from TD. As the said proposed project is scheduled to start in January 2020, the 42 PCM endorsed the project for implementation.

4.3 FAO-GEF project: Sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region for the benefit of coastal states and communities: Support to SEAFDEC Member Countries

161. The 42PCM took note and endorsed the project concept note as presented by the representative of the Secretariat.

162. In the ensuing discussion, the Program Committee Member for Malaysia commended SEAFDEC for serving as the regional implementation partner for the project. However, he also suggested that SEAFDEC should consider involving MFRDMD in the course of the project planning and implementation in view of its mandate and responsibility to promote sustainable fisheries management in the region.

163. While endorsing the proposed project, the Program Committee Member for Thailand expressed the appreciation to SEAFDEC for supporting the implementation of the Strategic Action Program of BOBLME through the activities under the proposed project. In this regard, he also looked forward to collaborating with this project in the near future.

4.4 World Bank project: Piloting the electronic ASEAN Catch Documentation Scheme (eACDS) in Viet Nam

164. The 42PCM was informed by the representative from TD that the “World Bank Project: Piloting the Electronic ASEAN Catch Documentation Scheme (eACDS) in Viet Nam” was developed for funding support from World Bank.

165. During the discussion, the Program Committee Member for Thailand acknowledged the importance of the eACDS in tracing the origin of the fish catch. Considering that the eACDS concept is useful and applicable to small-scale fisheries communities, he also requested SEAFDEC to consider establishing a learning site in existing tourism areas in order to expand the market access for small-scale fisheries communities, by building upon the success of the learning sites of EAFM, *e.g.* in Krabi Province of Thailand.

166. In responding to the query of the Program Committee Member for Malaysia regarding the complementarity of this project with the existing eACDS of SEAFDEC, the representative from TD clarified that this project supports the activities and training program for fisheries officers from Viet Nam, in addition to the eACDS system development which is implemented under the JTF.

V. COOPERATION WITH DONORS, NON-MEMBER GOVERNMENTS AND INTERNATIONAL/REGIONAL ORGANIZATIONS

167. Representatives from regional and international organizations and agencies collaborating with SEAFDEC were invited to inform the Program Committee of their relevant fisheries programs and the potential areas of mutual cooperation with SEAFDEC.

168. The representative from FAO/RAP, *Ms. Susana Siar*, thanked SEAFDEC for the invitation and opportunity to deliver a statement on areas of collaboration and mutual interest of FAO and SEAFDEC. She then congratulated SEAFDEC for having the first female Secretary-General, which is a huge milestone after 50 years of its existence. She mentioned about some of the existing and future areas of collaboration between FAO and SEAFDEC, particularly the GoTfish (under preparation) and BOBLME Phase-II projects. She emphasized that these two projects build on the achievements and seeds planted by existing projects and carry forward the good practices and lessons learned from the SEAFDEC-Sweden Project through the implementation of EAFM and the SSF Guidelines. She then reaffirmed FAO’s commitment to strengthen this collaboration in the coming years. Her Statement appears as **Annex 9**.

169. The representative from JICA, *Mr. Kota Sakaguchi* expressed the gratitude to SEAFDEC for the invitation to participate in the 42PCM. He made a presentation on several JICA cooperation projects in agriculture, livestock, and fishery sector implemented in collaboration with the AMSs. While emphasizing on the activities of the cooperation projects that include the “ASEAN-JICA Food Value Chain Development Project” and “ASEAN-JICA IUU Fishing Countermeasures,” he looked forward to enhancing the cooperation between SEAFDEC and JICA in the future. His presentation appears as **Annex 10**.

170. The representative from Gifu Prefectural Inland Fisheries Training Center, *Mr. Yutaka Nakai* thanked SEAFDEC for the invitation to attend the 42PCM. He made a brief presentation on the inland fisheries in Gifu Prefecture, Japan as well as the programs and activities of the Gifu Prefectural Inland Fisheries Training Center. He also presented about Ayu, as the most important fish species in Gifu, and its Nagara River System. Moreover, he also mentioned that in 2020, the Training Center would accept trainees from SEAFDEC Member Countries and Departments as well as dispatch fisheries specialists to the region upon request. He added that the communications about the training should be referred to the SEAFDEC Secretariat. His presentation appears as **Annex 11**.

171. The Program Committee Members for Indonesia, Myanmar, and Thailand as well as the Secretary-General in her capacity as the Chairperson of the SEAFDEC Program Committee, expressed gratitude to the Training Center of Gifu Prefecture for providing support to SEAFDEC and the Member Countries (*e.g.* human resource capacity building) and looked forward to continuing the collaboration in the future.

172. The representatives from the Embassy of Sweden in Bangkok, *Ms. Åsa Hedén and Ms. Louise Herrmann* thanked SEAFDEC for the invitation to take part in the 42PCM. However, as they were unable to attend the Meeting, they delivered their messages through a recorded video.

While appreciating the collaboration between the Government of Sweden and SEAFDEC in implementing the SEAFDEC-Sweden Project, they also reiterated the important role of SEAFDEC in the sustainable development of fisheries in the Southeast Asian region, and looked forward to working again with SEAFDEC in the future.

173. On behalf of the U.S. Government, the representative from the USAID/RDMA, *Ms. Cristina Velez Srinivasan* expressed the gratitude to SEAFDEC for the invitation to participate in the 42PCM. After commending SEAFDEC for the appointment of its first female Secretary-General, she reiterated that SEAFDEC and USAID have established partnership since 2015 through the USAID Oceans activities and made progress on regional traceability, fisheries management, and the human aspects of Southeast Asia's fisheries. Although the USAID Oceans activities are now in the final year of implementation, USAID remains committed to the continued progress and engagement in sustainable fisheries. The U.S. Government therefore looks forward to continuing its support to biodiversity conservation in the region, building on existing partnerships, and identifying new opportunities to work together towards shared objectives. Her statement appears as **Annex 12**.

VI. OTHER MATTERS

174. The 42PCM took note of the presentation on the "New Regional Marine Conservation Activity Design" (**Annex 13**) by the representative from USAID/RDMA, which builds upon the successes of the USAID Oceans activities in continuing the efforts to combat IUU fishing and to promote sustainable fisheries and conservation of marine biodiversity. She also provided the five draft strategic approaches identified as potential areas for USAID targeted investments to reduce IUU and unsustainable fishing and conserve marine biodiversity in Asia and Pacific, namely: 1) Advance Regional Seafood Traceability; 2) Demonstrate Regional Transboundary Fisheries Management; 3) Private Sector Engagement; 4) Strengthen Regional Cooperation; and 5) Strengthen Regional Institutional Capacity. She also highlighted the key priorities of the Agency including the biodiversity policy, private sector engagement policy, Indo-Pacific strategy pillars of natural resources management, economic growth, and security and the journey to self-reliance. She then updated the 42PCM that the activity concept is being drafted and subject to the availability of funds.

VII. OTHER MATTERS (Closed Session)

7.1 Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030

175. The 42PCM took note of the progress made by SEAFDEC in revising the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 in response to the directives made by the SEAFDEC Council during its Fiftieth Meeting in 2018 (**Annex 14**), as presented by the representative from the SEAFDEC Secretariat. Moreover, the 42PCM was also informed that the two meetings organized by SEAFDEC in 2019 came up with the Draft Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030.

176. The 42PCM also noted that subsequent to the second meeting in September 2019, National Focal Point for Singapore has provided comments to the Draft which appears as *Appendix 1 and 2 of Annex 18*. In this regard, the Program Committee Members were also requested to provide additional comments on the Draft which should be sent to the SEAFDEC Secretariat by the end of November 2019.

7.2 Capacity Development Workshop on Stock Status Assessment and Estimation of SDG Indicator 14.4.1 for the Asia Pacific Region

177. The Program Committee noted the outputs of the Capacity Development Workshop on Stock Status Assessment and Estimation of SDG Indicator 14.4.1 for the Asia Pacific Region, which was conducted jointly by FAO and SEAFDEC on 2-4 October 2019 in Bangkok, Thailand (**Annex 15**), as presented by the representative from the SEAFDEC Secretariat. Specifically, the outputs of the Workshop include better understanding of participating countries on SDG Goal 14 and the Indicator 14.4.1, data format requirements and reporting procedures for the country to assess the SDG Indicator 14.4.1, awareness on stock assessment methods developed by FAO, and experience in the analysis of stock assessment using national data set for SDG Indicator 14.4.1.

7.3 Procedures for Establishment of Cooperation between SEAFDEC and Other Organizations

178. The 42PCM took note of the draft Procedures for Establishment of Cooperation between SEAFDEC and Other Organizations (**Annex 16**), which was presented by the representative from the SEAFDEC Secretariat. The draft Procedures, which was developed in response to the request of the Council Director for Japan, include the several types of organizations that the SEAFDEC Secretariat and Departments wish to establish cooperation with in line with the Article 12 and Article 13 of the Agreement on Establishing SEAFDEC, and the different procedures for approval (*i.e.*, the approval of the Council varies for each type of organization).

179. In the discussion, the Program Committee Member for Singapore drew the attention of the 42PCM to Article 6 of the Agreement Establishing SEAFDEC, of which the Paragraph 2 stated that “*The Council may delegate to the Secretary-General any or all of its powers, except the powers (vii) to approve agreements or arrangements referred in Article 12 of this Agreement, and (viii) to decide to receive assistance referred in Article 13 of this Agreement.*” Furthermore, the Administrative Regulation 3 Paragraph 3.2 (iv) stated that “*pursuant to Article 9, paragraph 2, and Article 12 of the Agreement and subject to any instructions given by the Council, the Secretary-General has the power and functions to conclude or authorize the respective Department Chief to conclude agreements and arrangements of cooperation in consultation with the Department Chief and the host country concerned.*”

180. The Program Committee Member for Singapore therefore expressed the view that the Council’s approval is required prior to signing any Agreement with other organizations, except for a certain scenario that requires the Secretary-General’s approval instead of the Council’s approval, *i.e.* agreement with the Government agencies of Member Countries responsible for the SEAFDEC Secretariat and Departments. In addition, he emphasized that the procedures applied by the SEAFDEC Secretariat should also apply to all Departments. He also emphasized that agreements should still be project specific, regardless if there is financial implication or not as there may be legal implication, and there should be an expiry date to all agreements.

181. In this regard, the 42PCM requested the SEAFDEC Secretariat to accommodate the recommendations of the Program Committee prior to submission of the final Procedures to the SEAFDEC Council for consideration.

VIII. CONCLUSION AND RECOMMENDATIONS OF THE FORTY-SECOND MEETING OF THE PROGRAM COMMITTEE

8.1 Adoption of the Report of the Program Committee Meeting

182. The Program Committee adopted the recommendations of its Forty-second Meeting on 13 November 2019. The Program Committee also noted that the Report would be submitted to the 52nd Meeting of SEAFDEC Council and to the ASEAN through the 22nd Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).

8.2 Date and Venue of the Forty-third Meeting of the Program Committee

183. In considering the date and venue of the Forty-third Meeting of the Program Committee, the Chief of Aquaculture Department (AQD) informed the 42PCM that AQD would host the Forty-third Meeting at the Courtyard of Marriott/Iloilo Convention Center in Iloilo City, Philippines tentatively on 10-15 November 2020. He also informed the Program Committee that AQD would seek the guidance of the SEAFDEC Secretariat in finalizing the schedule and related arrangements of the Meeting.

IX. CLOSING OF THE PROGRAM COMMITTEE MEETING

184. In her Closing Remarks, the Chairperson of the Program Committee extended the gratitude to the Committee Members and representatives from SEAFDEC collaborating partners for the valuable inputs that led to the improvement of the programs and activities of SEAFDEC. She also thanked the staff of the Training Department (TD) for the smooth arrangement of the 42PCM, and also the secretariat of the meeting for coming up with the draft Meeting Report for adoption. She reiterated that the adopted recommendations and outputs of the Meeting would be subsequently presented to the forthcoming meeting of the SEAFDEC Council for approval.

After wishing the Program Committee Members safe trip back to their respective countries, she declared the 42PCM closed. Her Closing Remarks appears as **Annex 17**.

185. The Program Committee Member for Indonesia, on behalf of the SEAFDEC Program Committee Members, expressed the gratitude to the Secretary-General of SEAFDEC as the Chairperson of the Meeting, for the efficient management of the 42PCM and to TD for the smooth arrangements of the Meeting, as well as for the logistic support accorded to the participants of the 42PCM.

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OPENING REMARKS

By *Ms. Malinee Smithrithee*
SEAFDEC Secretary-General

Distinguished Members of the SEAFDEC Program Committee,
Representatives from our Collaborating Partners,
My colleagues from SEAFDEC Secretariat and Departments,
Ladies and Gentlemen, Good Morning!

On behalf of SEAFDEC and as the Chief of SEAFDEC Training Department, I welcome all of you to the Forty-second Meeting of SEAFDEC Program Committee here in Chiang Mai, Thailand.

Ladies and Gentlemen, as you have already been aware of, in the Meetings of the SEAFDEC Program Committee, we begin our discussions with the Programs under the FCG/ASSP Mechanism that have been categorised into the six SEAFDEC Strategies. This is followed by the succeeding agenda on Departmental Programs, Other programs, and a review of the Pipeline Projects. In addition, as most of the projects will be completed this year, SEAFDEC would be proposing new projects that would start in 2020. We are therefore asking the Program Committee to review the results of the programs implemented in 2019 and endorse the proposed program activities for 2020.

As indicated in its Terms of Reference, the SEAFDEC Program Committee is expected to review and evaluate the activities and corresponding achievements of the SEAFDEC programs and activities to ensure that the issues and concerns of the Member Countries are addressed in such programs. To our collaborating partners, we would also welcome your comments and advise on our programs and activities. Please be assured that we would always value your recommendations for the improvement of our programs and activities.

At this juncture, we would also wish to reiterate that the outputs of this Meeting incorporating your recommendations, would be submitted to the forthcoming meeting of the SEAFDEC Council for consideration and approval, as well as to the ASEAN Sectoral Working Group on Fisheries or ASWGFi as appropriate through the Twenty-second Meeting of the FCG/ASSP to be held back-to-back with this Meeting. We would therefore appreciate deeply your utmost cooperation and active participation in the discussions.

With that note, Ladies and Gentlemen, let me now declare the Forty-Second Meeting of SEAFDEC Program Committee open. Thank you very much and have a good day!

AGENDA

Agenda 1: Opening of the Meeting

Agenda 2: Adoption of Agenda and Arrangement of the Meeting

Agenda 3: Review of SEAFDEC Program Implementation for the Year 2019 and Proposed Programs for the Year 2020

3.1 Programs under the Fisheries Consultative Group of the ASEAN- SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism

3.1.1 *Strategy I: Securing the Sustainability of Fisheries to Contribute to Food Security, Poverty Alleviation and Livelihood of People in the Region*

- Human Resource Development for Sustainable Fisheries
- Optimizing Energy Use/Improving Safety Onboard in Fishing Activities
- Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia
- Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia
- Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia
- Promotion of Countermeasures to Reduce IUU Fishing Activities
- Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand
- Offshore Fisheries Resources Exploration in Southeast Asia
- Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region
- Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region
- Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region
- Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia
- SEAFDEC-EU/CITES Sharks Project Phase II
- Strengthening the Effective Management Scheme with GIS (Geographic Information System) & RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMS

3.1.2 *Strategy II: Supporting the Sustainable Growth of Aquaculture to Complement Fisheries and Contribute to Food Security, Poverty Alleviation and Livelihood of People in the Region*

- Environment-Friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources
- Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region

3.1.3 *Strategy III: Ensuring the Food Safety and Quality of Fish and Fishery Products for the Southeast Asian Region*

- Chemicals and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins (ASP, AZA and BTX) and Harmful Algal Blooms (HABs) in the ASEAN region

3.1.4 *Strategy IV: Enhancing Trade and Compliance of the Region's Fish and Fishery Products with Market Requirements*

- Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products

3.1.5 *Strategy V: Addressing Cross-cutting Issues, such as Labor, Gender and Climate Change, where Related to International Fisheries*

- Assistance for Capacity Building in the Region to Address International Fisheries-related Issues

3.1.6 *Strategy VI: Empowering SEAFDEC to Strengthen Its Roles in the Region and to Improve Its Services to Member Countries*

- Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2
- Strengthening SEAFDEC Network for Sustainable Fisheries

3.1.7 *Special Project*

- Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia
- The Oceans and Fisheries Partnership (USAID Oceans)

3.1.8 *New Project*

- Strengthening a Regional Cooperation and Enhancing National Capacities to Eliminate IUU Fishing in Southeast Asia
- Harmonization and Enhancing Utilization of Fishery Statistics and Information
- Responsible Fishing Technology and Practice
- Enhancing Food Safety and Competitiveness of Seafood Products
- Assistance for Capacity Development in the Region to Address International Fisheries-related Issues
- Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region
- Sustainable Utilization of Anguillid Eels in the Southeast Asian Region
- Sustainable Utilization of Fisheries Resources and Resources Enhancement in Southeast Asia
- Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region
- Sustainable Aquaculture through Cost-Effective Culture Systems, and Prompt and Effective Aquatic Animal Health Management
- Management Scheme for Inland Fisheries in the Southeast Asian Region
- Small-scale Fisheries Management for Better Livelihood and Fisheries Resources
- Development of Stock Assessment Method for Strengthening of Resources Management Measures of Tropical Anguillid Eels in AMS

3.2 Departmental Programs

3.2.1 *Aquaculture Department*

- Quality Seed for Sustainable Aquaculture
- Healthy and Wholesome Aquaculture
- Maintaining Environmental Integrity through Responsible Aquaculture
- Adapting to Climate Change
- Meeting Social and Economic Challenges in Aquaculture
- Collaborative projects with the Philippine Government

- BFAR-legislated Multi-species Hatchery
- Establishment of a Feed Mill for a Low-cost Broodstock Diet

3.2.2 Training Department

- Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building
- Improvement of Fisheries Technology and Reduction of the Impact from Fishing

3.2.3 Inland Fishery Resources Development and Management Department

- Stock Assessment in Inland Fisheries
- Development of Capacity Building Plan to support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules and Conducting Training of Trainers on EAFM/EAA
- Improve livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence
- Modernizing Irrigated Agriculture to Protect and Restore Aquatic Biodiversity and Ecosystem Services in South-East Asia

3.3 Other Programs

- Implementing the Lower Mekong Fish Passage Initiative in Cambodia, Thailand, and Viet Nam

Agenda 4: Pipeline Projects and Emerging Needs for Preparation of Future Project Proposals

- 4.1 ASEAN-JICA project
 - ASEAN-JICA Food Value Chain Development Project (SEC)
 - ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Countermeasures in Southeast Asia (TD)
- 4.2 Gender Dimension in the Value Chain of Small-scale Fisheries & Aquaculture in Southeast Asia (FAO&TD)
- 4.3 FAO-GEF Project: Sustainable Management of Fisheries, Marine Living Resources and their Habitats in the Bay of Bengal Region for the Benefit of Coastal States and Communities: Support to SEAFDEC Member Countries (TD)
- 4.4 World Bank project: Piloting the electronic ASEAN Catch Documentation Scheme (eACDS) in Viet Nam (TD)

Agenda 5: Cooperation with Donors, Non-member Government and International/Regional Organization

Agenda 6: Other Matters

- 6.1 USAID/RDMA's Marine Conservation Activity

Agenda 7: Other Matters (Closed Session)

- 7.1 Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030
- 7.2 Capacity Development Workshop on Stock Status Assessment and Estimation of SDG Indicator 14.4.1 for the Asia Pacific Region
- 7.3 Procedures for Establishment of Cooperation between SEAFDEC and Other Organizations

Agenda 8: Conclusion and Recommendations of the Forty-second Meeting of the Program Committee

- 8.1 Adoption of the Report
- 8.2 Date and Venue of the Forty-third Meeting of the Program Committee

Agenda 9: Closing of the Meeting

**PROJECTS UNDER THE FISHERIES CONSULTATIVE GROUP OF THE ASEAN-
SEAFDEC STRATEGIC PARTNERSHIP (FCG/ASSP) MECHANISM
FOR THE YEAR 2019-2020**

I. Projects Categorized under Strategies

Strategy/Project Title	Lead Department	2019	2020	Appendix no.
Strategy I: Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region				
1. Human Resource Development for Sustainable Fisheries	TD	Y	N	1
2. Optimizing Energy Use/Improving Safety Onboard in Fishing Activities	TD	Y	N	2
3. Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia	TD	Y	N	3
4. Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia	IFRDMD	Y	N	4
5. Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia	IFRDMD	Y	N	5
6. Promotion of Countermeasures to Reduce IUU Fishing Activities	TD	Y	N	6
7. Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand	TD	Y	Y	7
8. Offshore Fisheries Resources Exploration in Southeast Asia	TD	Y	N	8
9. Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region <ul style="list-style-type: none"> • Improving the Data Collection of the Commercially-exploited Aquatic and Threatened Species • Facilitating fisheries activity information gathering through introduction of Community-based Resources Management/Co-management 	TD	Y	N	9
10. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD	Y	N	10
11. Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD	Y	N	11
12. Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia	SEC	Y	N	12
13. SEADFDEC-EU/CITES Sharks Project Phase II	SEC	Y	N	13
14. Strengthening the Effective Management Scheme with GIS (Geographic Information System) & RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMS	TD	Y	Y	14
Strategy II :Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region				
15. Environment-Friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources	AQD	Y	N	15

Strategy/Project Title	Lead Department	2019	2020	Appendix no.
16. Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region	AQD	Y	N	16
Strategy III :Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region				
17. Chemicals and Drug Residues in Fish and Fish Products in Southeast Asia –Biotoxins (ASP, AZA and BTX) and Harmful Algal Bloom (HAB) in the ASEAN region	MFRD	Y	N	17
Strategy IV: Enhancing trade and compliance of the region’s fish and fishery products with market requirements				
18. Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products	MFRDMD	Y	N	18
Strategy V: Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries				
19. Assistance for Capacity Building in the Region to Address International Fisheries-related Issues	SEC	Y	N	19
Strategy VI: Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries				
20. Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2	TD	Y	Y	20
21. Strengthening SEAFDEC Network for Sustainable Fisheries	SEC	Y	N	21

II. Special Projects

Project Title	Lead Department	Period	Appendix no.
22. Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia	SEC	2013-2019	22
23. The Oceans and Fisheries Partnership (USAID Oceans)	TD	2015-2019	23

Y = Program implemented during the year

N = Program not implemented during the year

PROJECT DOCUMENT**ACHIEVEMENTS FOR YEAR 2019**

			Project ID: 201401001
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Human Resource Development for Sustainable Fisheries		
Program Strategy No.:	I	Total Duration:	2014 - 2019
Lead Department:	Training Department (TD)	Lead Country:	None
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 290,196
Project Partner:	None	Budget for 2019:	USD 60,000
Project leader:	Panitnard Weerawat / TD	Involved Country:	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION**1. Brief Project Description**

Since 2014, the SEAFDEC Training Department (TD) has been conducting several regional training courses for its Member Countries (MCs), especially under the task on sustainable fisheries development, in this stage of the middle age of the project, the project propose to do the follow up activities, this to ensure that Member Countries can make use of this HRD project through the gained knowledge and skills which is transferred through several regional training and national training courses that are support to Member Countries by the project.

The propose follow up activities will be carried out through the set of the intensive national capacity building at the pilot and learning site through the task in improving the income of fishers through the fisheries activities. These tasks can be carried out through the promotion to increase value of the total captured and culture fish, to develop high value fish species dealt, to develop processing methods in adding high value to the product and to improve distributing channels of the capture and culture fish for the fishers.

There are several proposed pilot-learning sites from the regional E-EAFM and Fisheries Extension Methodologies training courses' participants from each country during the way forwards sessions which is one of the activity in each training course which are conducted by TD in the year 2014 and 2015, in this year of 2016, the project have reviewed on the needed of each proposed pilot for learning site, in focusing to improve the income of fishers through the fisheries activities, so that since the year of 2016, the human capacity building for improvement of income of fishers through the fisheries activities as a part of fisheries extension work has been proposed to implement at a pilot-learning sites in Myanmar, Cambodia and Lao PDR. The result and lesson learned of these will be used to share in the regional workshop on the EAFM concept application in the year 2019.

At the pilot-learning sites, the process will be mainly implemented by the key national officers. SEAFDEC will play role as only supporter through the national key officer's capacity building program.

2. Background and Justification

In referring to the plan of action on Sustainable Fisheries for Food Security Towards 2020 which was adopted in ASEAN-SEAFDEC Conference Fish for the People 2020 “Adaptation to a Changing Environment” in Bangkok, Thailand during 13-17 June 2011 emphasizes; Strengthen the capacity of fisheries communities and the capability of fisheries related organizations, NGOs and the private sector to better implement necessary actions towards enabling the communities and local organizations to increase resilience, improve livelihoods, alleviate poverty, adopt alternative livelihoods in support of **achieving sustainable development**, and encourage the participation of women and youth groups in the process; So that the key element of this HRD proposal is to continue in strengthen capability of fishery officers of the Member Countries to implement sustainable fisheries management and development through the application of the appropriate Monitoring Control and Surveillance (MCS) and the Ecosystem Approach to Fisheries Management (EAF) as well as to strengthen knowledge, skill and techniques of the fishery officers for the fisheries information improvement as the basement of monitoring resources utilization such throughout the region.

SEAFDEC TD took this challenge and has been conducted many training courses which focus for sustainable fisheries development. In this stage of mid-period of the project, TD would like to follow up and giving more specific support to each of the member country through in improving of income of fishers through the fisheries activities. Considering the importance of such follow-up and supporting activities, and to implement such activities more effectively and achieve better outcomes, SEAFDEC proposes to extend the project period for 2 years, until 2019.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: strengthen knowledge and skills of the key national officers in dealing with the sustainable fisheries development in all aspects but focusing more on the human wellbeing in improving their income through the adding value of the fishers' catches with the applicable and suitable methods.	Outcome 1: Fishers in the pilot-learning site will be improved their income through the responsible fisheries.	Output 1: pilot-learning site (s) of sustainable fisheries development in focusing on the improvement of incomes of fishers through the responsible fisheries activities, Output 2: Team of skilled key national officers to work on the pilot-learning site (s) as fisheries extension officers in promoting the adding value of the capture or culture fish in the suitable ways and methods	Activity 1: Specific and intensive human resource development and follow up activities on Sustainable Fisheries Management through the promotion of value adding methods for capture and culture fish in suitable and appropriate ways which targeting to improve the income of fishers through the responsible

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Human resource development on Sustainable Fisheries	<ul style="list-style-type: none"> • From 2014-2015, There are several regional training courses that have been conducted by SEAFDEC, these to full filled the needed from the MCs as well as to strengthen knowledge and skills of the fisheries officers in the MCs on sustainable fisheries management. However, under the umbrella of this task, SEAFDEC/TD conducted the training courses that list is as following: <ul style="list-style-type: none"> - Applicable MCS activities with taking consideration of Ecosystem Approaches for sustainable fisheries - Essential EAFM and Extension Methodologies (2 courses) • There were two participants from each country participated in each training course. <p>In parallel with the regional training courses, SEAFDEC also supported MCs in conducting national training course which base on the need and request from MCs. The courses are conducted as tailor-made training program. Each of the training course program is designed base on the need and real situation of the country.</p>
Sub-activity 1.1 Regional Training Course on Essential EAFM and Extension Methodologies	The regional training course was conducted for 6 days, two representatives from SEAFDEC Member Countries were invited. The training course content is mainly base on the E-EAFM and added the subject component of the fisheries extension methodologies.
Sub-activity 1.2 Development of training toolkit on fisheries extension methodologies	The set of training presentation was prepared and focused on fisheries extension methodologies methods, such as PRA, media production, and facilitation skills. The set of presentation was used to conduct the regional training course on essential EAFM and Fisheries Extension Methodologies. (Sub-act 1.1)
Sub-activity 2.1: Specific and intensive human resource development and follow up activities on Sustainable Fisheries Management through the promotion of value adding methods for capture and culture fish in suitable and appropriate ways	In referring to the regional and national training courses that are conducted for MCs, in this stage TD will follow up on the applicable of the knowledge and skills that the ex-participants have gained from the project's training courses. The selection of the pilot and learning sites for the follow up activities will be carried out through the reviewing process from the fisheries management plans that are proposed by the ex-participants from each country in each year, then step by step of the working process for improvement of income of fishers through the fisheries activities will be implemented by the ex-participants as the key players in each country, SEAFDEC/TD will play role as the supporter. The follow up activities will be carried out as specific and intensive HRD programs and activities in focusing on the improvement of income of fishers through the promotion of responsible fisheries
Sub-activity 2.1.1. Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders	The meeting is aimed to make the Courtesy called to the DDG and met with the national coordinator as well as others key officers for the HRD project implementation at a pilot- learning site in the selected countries, <ul style="list-style-type: none"> - Discussed and made the selection of the specific pilot-learning site - Visited and observed to the recommended pilot-learning sites and - Identified and prioritized the key stakeholders for the activities at the project learning site
Sub-activity 2.1.2. Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites	The workshop was conducted for about 3 days in the fisheries management area which aimed to engage key stakeholders for the fisheries management and to get the specific problems and issues as well as the idea for the management actions of the FMU. The target participants are the key stakeholders who are identified and prioritized by the EAFM core team.
Sub-activity 2.1.3. Training – workshop on Base-line survey on fisher's income and relevance data/information	The training workshop was conducted in the learning site which aim to gather key stakeholders on base line information, the table/matrix of the information needed was developed. There are two types of the information need that are the existing information which can be gathered

Activity	Description
gathering (in collaboration with Socio-economic section)	from other sectors by collaboration and another type is the new data/information which have to plan in collecting the information as well as the methods
Sub-activity 2.1.4. Training/workshop on development of the improvement of income 's fishers work plan	The training workshop was conducted in Thailand for 5 days, which is aimed to develop the fisheries management plan. Before the plan was draft out, the study visits to the related areas and activities on the appropriate methods in improvement of income of fishers through responsible fisheries activities and value adding on the fisheries products was carried out
Sub-activity 2.1.5. Finalize and formalize of the fisheries management plan	The two days' workshop was conducted to finalize the EAFM plan, participants are the key stakeholders of the FMU. After the plan was finalized, the EAFM core team handed in the EAFM plan to the DG, DDG and the high-ranking officers.
Sub-activity 2.1.6. Follow up on the working progress of the project at the pilot-learning	The follow up activity was conducted to monitor the results of each implement activity which are defined in the EAFM plan. The follow up activities covered the discussion in the obstacles which being the constrain in management action implementation.
Sub-activity 2.1.7. Regional workshop on the activities result and reporting on the lesson learned	The regional workshop is conducted in Bangkok, Thailand which aiming to share the lesson learn of the EAFM implementation of each learning site. Two representatives from each Member Countries are invited to the workshop. The workshop outputs are the combination of the lesson learned and the way forwards in applying/implementing EAFM in the SEA region.
Sub-activity 2.1.8. Production of promotional and training materials (in working collaborate with USAID-NOAA)	The E-EAFM training materials mainly the PowerPoint presentation and session plan were revised and updated through several workshops. The workshop was supported by USAID NOAA in collaboration with the JTF. Furthermore, the articles of case studies of each learning site of the project mainly, learning site in Myanmar, Cambodia, Lao PDR and (Ban Nai Nang), Thailand were written and compiled into the booklet.
Sub-activity 2.1.9. Evaluate of the HRD activities and find way forwards	The evaluate of the HRD activities will be carried out through the review discussion. The key success and failure of the HRD activities will be defined. The idea for implement the effective HRD project will be listed down.

3.3 Activity, Sub-activity and Proposed Budget for 2014-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2014	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
Activity 1:	Sub-activity 1.1 Regional Training Course on Essential EAFM and Extension Methodologies	36,340	35,000	0	0	0	0
	Sub-activity 1.2 Development of training toolkit on fisheries extension methodologies	0	14,700	0	0	0	0
Activity 2:	Sub-activity 2.1: Specific and intensive human resource development and follow up activities on Sustainable Fisheries Management through the promotion of value adding methods for capture and culture fish in suitable and appropriate ways	0	0	0	0	0	0

Activity	Sub-Activity	Y1 2014	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
	Sub-activity 2.1.1. Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders	0	0	10,000	0	7,500	0
	Sub-activity 2.1.2. Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites	0	0	15,000	0	9,700	8,000
	Sub-activity 2.1.3. Training – workshop on Base-line survey on fisher's income and relevance data/information gathering	0	0	0	12,850	10,000	8,000
	Sub-activity 2.1.4. Training/workshop on development of the improvement of income 's fishers work plan	0	0	0	13,500	8,075	0
	Sub-activity 2.1.5. Finalize and formalize of the fisheries management plan	0	0	0	0	0	6,000
	Sub-activity 2.1.6. Follow up on the working progress of the project at the pilot-learning	0	0	0	6,400	6,400 & 4,051	5,000 and 4,000
	Sub-activity 2.1.7. Regional workshop on the activities result and reporting on the lesson learned	0	0	0	12,250	12,250	11,000
	Sub-activity 2.1.8. Production of promotional and training materials (in working collaborate with USAID-NOAA)	2,000	2,000	2,350	300	0	2,305
Activity 3	Sub-activity 2.1.9. Evaluate of the HRD activities and find way forwards	0	0	0	0	0	0
	Sub-Total Budget	38,340	51,700	42,350	45,300	68,201	44,305

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

In focusing to improve the income of fishers through the responsible and sustainable fisheries activities, in the year 2019, the intensive and follow up activities for human capacity building for improvement of income of fishers through the fisheries activities as a part of fisheries extension work are implemented at the pilot-learning sites in Prek Thnot Commune, Teok Chhou district, Kampot province, Cambodia and Pak Kradang, Bolicumsei, Lao PDR. The series of the proposed activities were smoothly implemented in both mentioned countries.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Specific and intensive human resource development and follow up activities on Sustainable Fisheries Management through the promotion of value adding methods for capture and culture fish in suitable and appropriate ways					
Sub-activity 1.1 Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites for Lao PDR	Workshop	25 (5)	5 (3)	-	
Sub-activity 1.2 Training/workshop on development of the improvement of income 's fishers work plan for Lao PDR (merged with Training course or study visit to Thailand on improvement of income of fishers through responsible fisheries activities and value adding on the fisheries products and to observe effective and appropriate methods in adding high value in fish products)	Workshop	10 (4)	4 (4)	-	
Sub-activity 1.3 Finalize and formalize of the fisheries management plan	Workshop	25 (7)	3 (1)	-	
Sub-activity 1.4 Follow up on the working progress of the project at the pilot-learning	Follow up workshop	30 (15)	2 (1)	-	
Sub-activity 1.5 Regional workshop on the activities result and reporting on the lesson learned	Workshop	25	15	5	
Sub-activity 1.6 Production of promotional and training materials (in working collaborate with USAID-NOAA)	Workshop	15 (7)	10 (7)	7 (6)	

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Specific and intensive human resource development and follow up activities on Sustainable Fisheries Management through the promotion of value adding methods for capture and culture fish in suitable and appropriate ways		
Sub-activity 1.1 Workshop on key stakeholder's engagement and investigate the real and	- Agreement on the work activities of the project learning site - Agreement on the site that to be	The workshop was smoothly conducted during 5-7 March 2019.

Planned activity	Expected outcome/output	Achievements
current situation which lead to the low income of the fishers of the project sites for Lao PDR	implemented for the project activities -A group of key stakeholders for the learning site were identified	
Sub-activity 1.2 Training/workshop on development of the improvement of income 's fishers work plan for Lao PDR (merged with Training course or study visit to Thailand on improvement of income of fishers through responsible fisheries activities and value adding on the fisheries products and to observe effective and appropriate methods in adding high value in fish products)	-Draft of the fisheries management plan which focusing to increase the income of the fishers through the responsible fisheries	-The training workshop was conducted from 22 – 26 April 2019. -The EAM plan is developed in related to the results on the specific issues and the opportunity in increasing the incomes for the communities which found out as of the pilot-learning site
Sub-activity 1.3 Finalize and formalize of the fisheries management plan	EAFM plan for Aung Kradeng, Bolicumsei, Lao PDR	The workshop was conducted during 26-30 August 2019.
Sub-activity 1.4 Follow up on the working progress of the project at the pilot-learning	Report on the “Result and lesson learned from the pilot project implementation in applying the concept of the EAFM into the real situation of the project leaning site- Pak Krading, Bolicumsai, Lao PDR	The activity of the follow up activity and evaluate on the result of sub-project implementation which is carried out in the learning site was carried out during 23 to 27 September 2019.
Sub-activity 1.5 Regional workshop on the activities result and reporting on the lesson learned	compilation of the lesson learned in implement/apply EAFM in different learning sites Set of the way forwards in applying/implementing EAFM in the SEA region	The regional workshop was conducted at Bangkok, Thailand from 7-8 October 2019.
Sub-activity 1.6 Production of promotional and training materials (in working collaborate with USAID-NOAA	-The revised E-EAFM training materials <i>e.g.</i> PowerPoint presentation, session plan	The write shops /workshops were carried out from 11-15 February 2019, and 3-7 June 2019 and trial to deliver for BFAR officers, Iloilo, Philippines during 9-13 September 2019.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
Report of the workshop on key stakeholder's engagement and investigate the current and specific issues/problems of the FMU- Aung Kraduan, Bolicumsei, Lao PDR	Hard copy and e-file	Y
Report of the training/workshop on development of the EAFM Plan and study visit to the related activities for improve income of fishers through responsible fisheries and value adding on the fisheries products and to observe effective and appropriate methods in adding high value in fish products	Hard copy and e-file	Y
Report of the workshop in Finalizing and formalizing of the fisheries management plan	Hard copy and e-file	Y
Report of the follow up on the working progress of the project at the pilot-learning site	Hard copy and e-file	Y
Report of the regional workshop on the lesson learned of the EAFM implementation in the different learning sites	Hard copy and e-file	Y

List of completed publications for the year 2019	Type of media	Attached e-file
Revised E-EAFM training materials; PowerPoint presentation and session plan	Hard copy and e-file	Y
Booklet of the EAFM Case studies combination	Hard copy and e-file	Y

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1 Specific and intensive human resource development and follow up activities on Sustainable Fisheries Management through the promotion of value adding methods for capture and culture fish in suitable and appropriate ways	
Sub-activity 1.1 Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites for Lao PDR	-The EAFM core team be able to facilitate the workshop and be able to come up with a set of the FMU specific problems and issues.
Sub-activity 1.2 Training/workshop on development of the improvement of income 's fishers work plan for Lao PDR (merged with Training course or study visit to Thailand on improvement of income of fishers through responsible fisheries activities and value adding on the fisheries products and to observe effective and appropriate methods in adding high value in fish products)	-The EAFM core team be able to facilitate the workshop and be able to come up with a the EAFM plan for the FMU.
Sub-activity 1.3 Finalize and formalize of the fisheries management plan	
Sub-activity 1.4 Follow up on the working progress of the project at the pilot-learning	-EAFM core team could facilitate the activities by conducted the FGD and monitor the activities through the activities' objectives indicators
Sub-activity 1.5 Regional workshop on the activities result and reporting on the lesson learned	
Sub-activity 1.6 Production of promotional and training materials (in working collaborate with USAID-NOAA	The revised E-EAFM training materials was used to trial and deliver during the exchange learning with the BFAR staff, Iloilo, Philippines. Participants agreed that it is simple and interested to learn.

6. Major Impacts/Issues

Changing of the EAFM core team member during the implementation of the EAFM in the project learning site, due to this the activities will not smoothly be implemented.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

The projects built up and strengthen the human resource on sustainable fisheries in SEA countries. The EAFM core team of each country who are understand and be able to apply/implement the EAFM concept to the real situation in their countries can be recognized as the key persons to develop the EAFM plan as well as implement the EAFM for their countries. There are the EAFM learning sites implementing as the case studies, there are in Aung Kan Tha, Mon state- Myanmar, in Kampot-Cambodia, in Aung Kradang, Bolicumsei-Lao PDR and Ban nai nang, Krabi province-Thailand

2. Implemented Activities/sub-activities in the Overall Project Duration

Activity	Description
Activity 1 Human resource development on Sustainable Fisheries	<ul style="list-style-type: none"> • From 2014-2015, There are several regional training courses that have been conducted by SEAFDEC, these to full filled the needed from the MCs as well as to strengthen knowledge and skills of the fisheries officers in the MCs on sustainable fisheries management. However, under the umbrella of this task, SEAFDEC/TD conducted the training courses that list is as following: <ul style="list-style-type: none"> - Applicable MCS activities with taking consideration of Ecosystem Approaches for sustainable fisheries - Essential EAFM and Extension Methodologies (2 courses) • There were two participants from each country participated in each training course. <p>In parallel with the regional training courses, SEAFDEC also supported MCs in conducting national training course which base on the need and request from MCs. The courses are conducted as tailor-made training program. Each of the training course program is designed base on the need and real situation of the country.</p>
Sub-activity 1.1 Regional Training Course on Essential EAFM and Extension Methodologies	The regional training course was conducted for 6 days, two representatives from SEAFDEC Member Countries were invited. The training course content is mainly base on the E-EAFM and added the subject component of the fisheries extension methodologies.
Sub-activity 1.2 Development of training toolkit on fisheries extension methodologies	The set of training presentation was prepared and focused on fisheries extension methodologies methods, such as PRA, media production, and facilitation skills. The set of presentation was used to conduct the regional training course on essential EAFM and Fisheries Extension Methodologies. (Sub-act 1.1)
Sub-activity 2.1: Specific and intensive human resource development and follow up activities on Sustainable Fisheries Management through the promotion of value adding methods for capture and culture fish in suitable and appropriate ways	In referring to the regional and national training courses that are conducted for MCs, in this stage TD will follow up on the applicable of the knowledge and skills that the ex-participants have gained from the project's training courses. The selection of the pilot and learning sites for the follow up activities will be carried out through the reviewing process from the fisheries management plans that are proposed by the ex-participants from each country in each year, then step by step of the working process for improvement of income of fishers through the fisheries activities will be implemented by the ex-participants as the key players in each country, SEAFDEC/TD will play role as the supporter. The follow up activities will be carried out as specific and intensive HRD programs and activities in focusing on the improvement of income of fishers through the promotion of responsible fisheries
Sub-activity 2.1.1. Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders	The meeting is aimed to make the Courtesy called to the DDG and met with the national coordinator as well as others key officers for the HRD project implementation at a pilot- learning site in the selected countries, <ul style="list-style-type: none"> - Discussed and made the selection of the specific pilot-learning site - Visited and observed to the recommended pilot-learning sites and - Identified and prioritized the key stakeholders for the activities at the project learning site
Sub-activity 2.1.2. Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites	The workshop was conducted for about 3 days in the fisheries management area which aimed to engage key stakeholders for the fisheries management and to get the specific problems and issues as well as the idea for the management actions of the FMU. The target participants are the key stakeholders who are identified and prioritized by the EAFM core team.
Sub-activity 2.1.3. Training –workshop on Base-line survey on fisher's income and relevance	The training workshop was conducted in the learning site which aim to gather key stakeholders on base line information, the table/matrix of the information needed was developed. There are two types of the information need that are the existing information which can be gathered from other

Activity	Description
data/information gathering (in collaboration with Socio-economic section)	sectors by collaboration and another type is the new data/information which have to plan in collecting the information as well as the methods
Sub-activity 2.1.4. Training/workshop on development of the improvement of income 's fishers work plan	The training workshop was conducted in Thailand for 5 days, which is aimed to develop the fisheries management plan. Before the plan was draft out, the study visits to the related areas and activities on the appropriate methods in improvement of income of fishers through responsible fisheries activities and value adding on the fisheries products was carried out
Sub-activity 2.1.5. Finalize and formalize of the fisheries management plan	The two days workshop was conducted to finalize the EAFM plan, participants are the key stakeholders of the FMU. After the plan was finalized, the EAFM core team handed in the EAFM plan to the DG, DDG and the high ranking officers.
Sub-activity 2.1.6. Follow up on the working progress of the project at the pilot-learning	The follow up activity was conducted to monitor the results of each implement activity which are defined in the EAFM plan. The follow up activities covered the discussion in the obstacles which being the constrain in management action implementation.
Sub-activity 2.1.7. Regional workshop on the activities result and reporting on the lesson learned	The regional workshop is conducted in Bangkok, Thailand which aiming to share the lesson learn of the EAFM implementation of each learning site. Two representatives from each Member Countries are invited to the workshop. The workshop outputs are the combination of the lesson learned and the way forwards in applying/implementing EAFM in the SEA region.
Sub-activity 2.1.8. Production of promotional and training materials (in working collaborate with USAID-NOAA)	The E-EAFM training materials mainly the PowerPoint presentation and session plan were revised and updated through several workshops. The workshop was supported by USAID NOAA in collaboration with the JTF. Furthermore, the articles of case studies of each learning site of the project mainly, learning site in Myanmar, Cambodia, Lao PDR and (Ban Nai Nang), Thailand were written and compiled into the booklet.
Sub-activity 2.1.9 Evaluate of the HRD activities and find way forwards	The evaluate of the HRD activities will be carried out through the review discussion. The key success and failure of the HRD activities will be defined. The idea for implement the effective HRD project will be listed down.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1	
Sub-activity 1.1 Regional Training Course on Essential EAFM and Extension Methodologies	-50 fisheries officers as Number of participants who were trained in two courses
Sub-activity 1.2 Development of training toolkit on fisheries extension methodologies	-A set of PowerPoint presentation on Fisheries extension methodologies
Activity 2 Sub-activity 2.1: Specific and intensive human resource development and follow up activities on Sustainable Fisheries Management through the promotion of value adding methods for capture and culture fish in suitable and appropriate ways	-7 persons of the EAFM core team in each country of Myanmar, Cambodia, Lao PDR and 14 persons for Thailand -Project learning sites in implementation of the EAFM concept in Myanmar, Cambodia, Lao PDR and Thailand
Sub-activity 2.1.1 Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders	- Agreement on the work activities of the project learning site - Agreement on the site that to be implemented for the project activities -A group of key stakeholders for the learning site were identified

List of Activities	Achievements and Outcomes/Outputs of Activities
Sub-activity 2.1.2. Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites	-Sets of the specific problems and issues of the learning sites which are in FMU of (1) Aung Kantha, Mon state, Myanmar, (2) Phek, Kampot, Cambodia, (3) Aung Kradang, Bolocumsei, Lao PDR and (4) Ban Nai Nang, Krabi, Thailand
Sub-activity 2.1.3. Training – workshop on Base-line survey on fisher's income and relevance data/information gathering	-Sets of baseline information which used for the EAFM planning and monitoring-evaluation
Sub-activity 2.1.4. Training/workshop on development of the improvement of income 's fishers work plan	-Draft of the EAFM plan for 4 learning sites-FMU
Sub-activity 2.1.5. Finalize and formalize of the fisheries management plan	-Finalized of the EAFM plan for 4 learning sites-FMU
Sub-activity 2.1.6. Follow up on the working progress of the project at the pilot-learning	-Report on the “Result and lesson learned from the pilot project implementation in applying the concept of the EAFM into the real situation of the project leaning sites (4 learning sites-FMU)
Sub-activity 2.1.7. Regional workshop on the activities result and reporting on the lesson learned	-Compilation of the lesson learned in implement/apply EAFM in different learning sites -Set of the way forwards in applying/implementing EAFM in the SEA region
Sub-activity 2.1.8. Production of promotional and training materials (in working collaborate with USAID-NOAA)	The revised E-EAFM training materials <i>e.g.</i> PowerPoint presentation, session plan
Sub-activity 2.1.9 Evaluate of the HRD activities and find way forwards	Set of the key success and failure of the HRD The idea for implement the effective HRD and way forwards

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Training course

Language and communication during the courses deliver to the regional participants

Learning sites implementation

The changing and not continue of the key staff as the EAFM core team in some countries, due to this it makes the activities which need to be facilitated and carried out not become smoothly enough.

5. Publications and Others

- 1) Report of the regional training courses on E-EAFM and Fisheries Extension Methodologies
- 2) Article on Application of the Fisheries Extension in Fisheries Management (Fish for the people)
- 3) Reports of the sub-activities of the four learning sites - FMU;
 - (1) Aung Kantha, Mon state, Myanmar,
 - (2) Phek, Kampot, Cambodia,
 - (3) Aung Kradang, Bolocumsei, Lao PDR and
 - (4) Ban Nai Nang, Krabi, Thailand

The report titles are as follows.

- 3.1 Report of the workshop on key stakeholder's engagement and investigate the current and specific issues/problems



- 3.2 Report of the training/workshop on development of the EAFM Plan and study visit to the related activities for improve income of fishers through responsible fisheries and value adding on the fisheries products and to observe effective and appropriate methods in adding high value in fish products
- 3.3 Report of the workshop in Finalizing and formalizing of the fisheries management plan
- 3.4 Report of the follow up on the working progress of the project at the pilot-learning site
- 3.5 Report of the regional workshop on the lesson learned of the EAFM implementation in the different learning sites
- 4) Revised E-EAFM training materials; PowerPoint presentation and session plan
- 5) Booklet of the EAFM Case studies combination

PROJECT DOCUMENT**ACHIEVEMENTS FOR the YEAR 2019**

			Project ID: 2013010102
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Optimizing Energy Use and Improving Safety in Fishing Activities		
Program Strategy No. :	I	Total Duration:	2015 - 2019
Lead Department:	Training Department (TD)	Lead Country:	Thailand
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 174,293
Project Partner:	None	Budget for 2019:	USD 71,290
Project Leader:	Suthipong Thanasansakorn / TD	Project Participating Country(ies) :	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION**1. Brief Project Description**

In the Southeast Asian countries, the human well-being of fishers has been degraded by the less concern for the safety of fishers at sea. Awareness building on the safety at sea for fishers includes the improvement of safety at sea, living and working conditions onboard to ensure that the human well-being of fishers will be strengthened.

In the capturing process, the fuel costs take up the most of operational costs and directly affect the income of fishers. With reference to the global concern about Climate Change that includes the reductions of greenhouse gases, either by reducing the source of polluters, the Project deals with fuel efficiency measures that require the minimal modification of their existing equipment to optimize energy using for the fishing operations. The main activities under the Project include transferring appropriate ways to optimize the use of energy for the fishing vessels. It also includes the adjustment/improvement of current practices of the vessels. In this connection, the Project aims at transferring appropriate and applicable technology and knowledge to fishers and fisheries officials in order to optimize an energy use in fishing activities and improves a safety at sea for fishers and fishing vessels especially on the small fishing vessel.

2. Background and Justification

Resolution:

#12 Support ASEAN efforts to promote low carbon development by minimizing the contribution of the fisheries sector to greenhouse gas emissions, with emphasis on promoting energy efficiency and use of alternative energy sources

13 Improve the working conditions of people engaged in fisheries activities and strengthen measures for the safety of fishing vessels taking into consideration regional specificity

15 Increase the efficient use of alternative energy and reduce the use of carbon fossil energy by using appropriate fishing gear and fishing boat designs in fishing operation.

Plan of Action – Fisheries Management:

20 Adjust existing programs to take into consideration the effects of climate change, focusing on the programs for (i) managing fisheries and habitats; (ii) reducing fishing capacity and combating Illegal, Unreported and Unregulated (IUU) fishing; (iii) strengthening local organizations; and (iv) promoting safety at sea and other priority areas. Develop indicators and reporting measures to assess how actions of the programs build resilience to climate change

30 Strengthen efforts to address safety at sea, including considerations of working conditions and socio-economic development, and ensure that these considerations are addressed by all concerned authorities while improving monitoring and control of the status of conditions, especially on small fishing boats

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome, and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To transfer the appropriate knowledge and enhance awareness on optimizing energy use in fishing activities and safety at sea for fishing vessels in the Member Countries	Outcome 1: Enhancement of knowledge and experience of ship owners, fisheries extension officer, and other key stakeholders of ASEAN Member States	Output 1: Report of the training organized in the ASEAN Member States and Network for optimizing energy use and safety at sea for the fishing vessel was establishments.	Activity 1.1 Regional and national training on optimizing energy use and safety at sea for fishing vessels Activity 1.2 On-site training on energy optimization use and safety for small fishing in Southeast Asian countries.
Objective 2: Research and development of the improvement for good fishing operations and practices with optimizing energy used included working conditions and safety at sea.	Outcome 2: Appropriate ways and techniques on improve sustainable fishing vessel design, fishing gear and Fishery machinery for trawl and purse seine fishery.	Output 2: Issues and planning process on the energy-saving and safety at sea for developing a conceptual framework and way forward to promote the optimizing energy and safety at sea in the SEA region.	Activity 2: Research and development on the implement of fishing operation with optimizing energy use Activity 2.1 Preliminary surveys and technical meetings at the pilot site for gathering information on improving optimizing energy used.
Objective 3: Disseminate the technical information activities, output and progress reference for optimizing energy and safety at sea for fishing vessels to the Member Countries.	Outcome 3: Enhancement of the key stakeholders on international, regional, and national references for the improvement of optimizing energy use and safety at sea for fishing vessels of ASEAN Member States	Output 3: Provided the international guidelines for optimizing energy and safety at sea to the key stakeholders. (A technical manual on energy optimization and safety in English and Myanmar had provided)	Activity 3: Information dissemination

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1.1 Regional training/workshop on optimizing energy used and safety for small fishing vessel	A series of activities to promote and transfers the optimization of energy use and safety at sea for fishing vessels will be carried out in the Member Countries. The training program will provide the knowledge and skill to fisheries officials and other key stakeholders for the existing methods and techniques in energy-saving use, safety at sea in fishing activities. In addition to awareness building on energy optimization and safety at sea, as well as improvement of working conditions on fishing vessels will be strengthened. SEAFDEC will support the establishment of the network of stakeholders in coastal provinces for sharing technical information about energy optimization and safety at sea. Threats, issues, and way forward for the promotion of energy optimization and safety at sea in capture fishery of Southeast Asia will be identified.

Activity	Description
Activity 1.2 On-site training on the optimizing energy and safety at sea for small fishing vessels	The on-site training or workshop will be organized to transfer the technical information and update the situation of energy use in fishing operations as well as the update on information on safety at sea for small fishing vessels to enhance human capacity on energy-saving and safety in marine fisheries. In order to share and exchange the information and technology on energy optimization used and safety at sea, the network of stakeholders in coastal provinces on both at the regional/national level and will be strengthened
Activity 2: Research and development on the implement of fishing operation with optimizing energy use	The series of activity aims to apply appropriate techniques, use or adopt various technologies in order to improve fishing vessel Capture per unit effort (CPUE) base on optimizing energy use (energy saving) in fishing activities through the efficiency improvement of the fishing vessel construction, fishing gears, materials and fishing equipment relate to fishing operation.
Activity 2.1: Preliminary surveys and technical meetings at the pilot site for gathering information on improving optimizing energy used.	The project has included the preliminary surveys for data collection and organized the meeting for gathering the information on appropriate fishing vessel design, in collaboration with relevant agencies, fishers, fishery association and others key stakeholder on optimizing energy use and safety at sea for gathering the information aims to improve good fishing vessel operation for the future.
Activity 3: Information dissemination	Compilation of the FAO/ILO/NRIFE handbook/Guideline and translate to local language and disseminate as the training materials will be made. Moreover, major outputs from the implementation of project activities and their progress will be disseminated to the Member Countries and other relevant agencies through website, training and promotional materials, etc. The outputs from this activity could also be used as the regional reference for optimizing energy and safety at sea for fishing vessels in the Member Countries.

3.3 Activity, Sub-activity, and Proposed Budget for 2015-2019

(Unit: USD)

Activity	Sub-Activity	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1.1 Regional training/workshop on optimizing energy used and safety for small fishing vessel		31,000	25,175	25,000		28,000
Activity 1.2 On-site training on the optimizing energy and safety at sea for small fishing vessels					23,000	
Activity 2: Research and development on the implement of fishing operation with optimizing energy use				3,000	78,000	30,000
Activity 2.1 Preliminary surveys and technical meeting at the pilot site						10,000
Activity 3		5,000	4,825	4,000	4,003	3,290
	Sub-Total	36,000	30,000	32,000	105,003	71,290

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

SEAFDEC/TD conducted the training program on optimizing energy used and safety at sea on 5 August 2019. The training program included 7 SEAFDEC Member Countries (MCs) with 15 participants. The project activity on the improvement of appropriate fishery machinery for seine fishing vessel was implemented in Binh Dinh Province, Viet Nam. Also, appropriate fish handling tools were designed and constructed for reducing a post-harvest loss by preventing heat gains in the fish holds and producing cold medium at sea and transporting the catches from a fishing ground to a shore base on optimizing energy used and safety working onboard. TD also conducted technical meetings at the pilot sites and vessels for gathering the information on improving optimizing energy used. The monitoring program on installation timing, contact person, personal involvement and ways forward for TD and Viet Nam is under progress before and after implementing the project. TD produced and disseminated the technical information to MCs and involved and participated in the international forum.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1. Regional and national training on optimizing energy use and safety at sea for fishing vessels	Training	7 countries almost 15P			28,000
Activities 2. Research and development on the implement of fishing operation with optimizing energy use	R&D	Viet Nam			30,000
Activity 2.1 Preliminary surveys and technical meetings at the national level for gathering the information relevant to improving the achievement of the project	Site visit Field survey and monitoring	Viet Nam			10,000
Activities 3. Information dissemination			3P		4,003

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Activity 1.1 Regional review training program on the optimizing energy and safety at sea for small fishing vessels	Technical information had disseminated to the ASEAN Member States and Network for optimizing energy use and safety at sea for the fishing vessel was establishments.	The regional reviews training program on optimizing energy used and safety at sea had conducted on Aug 5-9, 2019. The training program consisted of 7 Member Countries <i>i.e.</i> Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Viet Nam, and Thailand totally 15 participants participated in the training program. They were consolidated learned in the progressive manner of optimizing energy used and safety at sea. The results from the training and visit the pilot vessel and site can be taken to improve the optimization of fuel efficiency used through various actions such as the gears designed, materials, construction, fishing operation and practices.

Planned activity	Expected outcome/output	Achievements
Activity 2 Research and development on the implement of fishing operation with optimizing energy use	Technical knowledge and information will be transfer to the important pilot site of Viet Nam.	This activity had implemented in Viet Nam aims to improve an appropriate fish handling tools for prolonging the fish freshness of seine fishing vessel base on energy optimization used was developed correspondingly to the user by delay the melting of ice onboard at Binh Dinh Province of Viet Nam. TD designed and constructed a simple refrigeration system for the local fishing vessel used to produce the cold medium during at sea to prolong the freshness on the basis of energy optimization used. Currently, TD plan for logistics and conduct the technical meeting, plan for installation, and monitoring at the pilot vessel at Binh Dinh province by the end of this year.
Activity 2.1 Preliminary surveys and meeting at the national level for gathering the information relevant to improving the achievement of the project.	Results of the Evaluation and beneficially of the project	The percentage (%) of losses at the fish landing site is the indicator for TD and Viet Nam to plan for the monitoring process before and after implementing the project.
Activity 3		
		The production of technical information of the project on the safety recommendations and energy optimization had disseminated at the review training program and available on the website.
Activity 3.1	The knowledge gained from Japan will transfer to SEAFDEC/TD members and MCS and able to apply for their further duties.	TD supported technical staff (1P) to participate in the International Conference on Fisheries Engineering (ICEF2019) during 21-24 September 2019. 2 persons to attend the technical training course on operation and maintenance of marine engine at Myanmar Company, Nagasaki, Japan.
Activity 3.3	Technical information and good practices had transferred to the fishing fleet of Thailand	TD had Launching the pilot purse seine fishing vessel at Pattani Province, Thailand, base on the adoption of technology for improving fishing operation with optimizing energy use and safety working at sea and reduce labor issue onboard.
Activity 3.4	Promote sustainable fishery development in the fishing fleet of Thailand	TD has delivered 2 drawing plans for the new version of trawl and purse seine fishing vessels together with both models for the future of Thailand's fishing vessels to the Department of Fisheries, Thailand. With the designed that promotes sustainable fishery development in the future, and on the basis of energy optimization used, Reduce labor onboard, Promoting hygiene onboard, good practices and reducing environmental impact.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
Launching of the pilot purse seine fishing vessel with optimizing	News, VDO,	1. https://www.thairath.co.th/news/local/1641868 2. https://mgronline.com/south/detail/9620000077115

List of completed publications for the year 2019	Type of media	Attached e-file
energy used, reduce labor; improve good practice, and living conditions.	Picture	3. https://www.youtube.com/watch?v=ThuAhyS8Nb0 4. https://policemagazine24.blogspot.com/2019/08/blog-post_931.html

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1.1 The review training program on the optimizing energy and safety at sea for small fishing vessels	TD should provide the technical information and technology transfer to coverage to both coastal and offshore capturing especially auxiliary machinery of small local fishing vessels <i>e.g.</i> hauling devices appropriate for different gear types, fish handling tools, on the basis of optimizing energy used or alternative sources

6. Major Impacts/Issues

Important issues and impacts of the project in 2019.

- The personal involves the project *e.g.* focal point and supported local staff and facilities should be taken into consideration.
- The follow-up program/reviews and budget should be provided for effective and further evaluation of the achievement.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

TD had conducted a series of activities to promote and transfer the optimization of energy use and safety at sea for fishing vessels that have been carried out through the regional and on-site training programs. The project had improved year by year the curriculum (base on the evaluation and comment by PCM) for organizing the training in collaboration with relevant agencies on optimizing energy use and safety at sea for small fishing vessels from the year 2011 till the year 2019. The project had translated international guidelines, to the local languages. Such training materials have been used as the guideline for training programs to enhance awareness of fishers and fisheries officials of fuel efficiency used and safety at sea for the fishing vessels. The international initiative technique such as the fishing vessel fuel audits system is used as a tool to measure fuel consumption of the vessel operation has introduced in the training program.

TD had conducted a series of activities aim to implement appropriate techniques, use or adopt various techniques in order to improve energy-efficient used (energy optimization) in fishing activities through the improvement of vessels, gears, and types of equipment related to the fishing operation. TD had considered that the fisheries machinery, fish preservation, and propulsion system are an important system for a fishing vessel, fishing and operation technique developing these to be effective, by energy optimization will benefit to fisher. To achieve the above mention power takeoff were used to support the operation of the crane, power block, nets drum, and refrigeration system have implemented through 2 pilot vishing vessel namely M.V. Plalung 1 of the training department this vessel focus on trawl operation and Laprasert-8 at Pattani province, aims to focus on seine fishing.

Compilation of the FAO/ILO/NRIFE handbook/Guideline and translate to local language and disseminate as the training materials had made. Moreover, major outputs from the implementation of project activities and their progress had disseminated to the Member Countries through the training program and other relevant agencies through website, training and promotional materials, etc. The outputs from this activity could also be used as the regional reference for optimizing energy and safety at sea for fishing vessels in the Member Countries.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activity	Description of Implemented Activities
Activity 1	
Activities 1.1 Regional training workshop on optimizing energy and safety at sea for small fishing vessels.	Regional Review Training Program on Optimizing energy used and Improving Safety in Fishing Activities August 5-9, 2019 SEAFDEC/TD (15 participants)
Activities 1.2 On-site training workshop on optimizing energy and safety at sea for small fishing vessels.	<ul style="list-style-type: none"> - On-site Training on Energy Saving and Safety at Sea for Small Fishing Vessels 29 September – 1 October 2015 Preah Sihanouk province, Cambodia (37 participants) - On-site Training on Energy Saving and Safety at Sea for Small Fishing Vessels 20 – 22 September 2016 Preah Sihanouk province, Cambodia (29 participants) - On-Site Training on Energy Saving and Safety at Sea for Small Fishing Vessels for the Trainers KUALA TERENGGANU (DUNGUN), MALAYSIA 3-5 OCTOBER 2017 (32 participants) - On-site Training on Energy Saving and Safety at Sea for Small Fishing Vessels 8-10 October 2018 Yangon, Myanmar (29 participants)
Activity 2: Research and development on the implement of fishing operation with optimizing energy use	
	<ol style="list-style-type: none"> 1. To gather the technical information from the fishing fleet of Thailand by conducted the technical meeting and field surveys to collect the necessary information for future fishing vessel design. 2. Design and installation of fishery machinery (hydraulic net drum) for the TD pilot fishing vessel (M.V. Plalung1) basis on optimizing energy used, 3. Design and installation of fishery machinery (hydraulic crane, power-block and fish preservation system) for the purse seine pilot fishing vessel at Pattani province target for the reduction of the labor shortage in the fishing fleet of Thailand base on optimizing energy used,
3) Production of information materials	TD had developed various types of training materials/model/fishing gears for fishing vessel operations that used to share and impart the technical information

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1 and 2 Organize the training program for the regional and on-site training program	The international/national initiative technique and information had introduced and transferred to the fishing fleet of SEAFDEC Member Countries in both lecture and practices such information included an FAO safety recommendations and energy-saving measure and the fishing vessel fuel audits program is used as a tool to measure fuel consumption of its own vessel operation had introduced and practiced in the training program.
Activity 2	<p>The year 2018</p> <ol style="list-style-type: none"> 1. Improve training vessel M.V. Plalung1, currently used to present as a model for improving good practices, fish handling techniques. <p>The year 2019</p> <ol style="list-style-type: none"> 2. Launching the purse pilot fishing vessel was conducted on 13 August 2019 at Pattani Fish Market Organization, pier. With Dr. Adisorn Promthep The Director-General of the Department of Fisheries, <u>Ministry of Agriculture and Cooperatives, Thailand as the president of the ceremony</u> <p>The results of achieving were:</p> <ul style="list-style-type: none"> - Reduce human on a fishing vessel by 60% - Fuel consumption cost reduce by 5% - Operating cost reduced by 40% (Labor cost, ice consumption, food, and documentation e.g. employment contract, seamen book, etc.)+

List of Activities	Achievements and Outcomes/Outputs of Activities
	<ul style="list-style-type: none"> - Operating cost reduced by 40% (Labor cost, ice consumption, food, and documentation <i>e.g.</i> employment contract, seamen book, etc.)+ - Fish landing at landing loss was reduced from 5-10% to less than 0.5% <p>The year 2019 3. TD had deliveries the conceptual Design for Trawl and Seine Fishing Vessel's plan and model to the department of the fishery of Thailand. The designed basis on the sustainable fishery development goals and to meet for the future involving international standard.</p>

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Important issues and impacts of the project in 2019.

- The personal involves the project *e.g.* focal point and supported local staff and facilities should be taken into consideration.
- The follow-up program/reviews and budget should be provided for effective and further evaluation of the achievement.

5. Publications and Others

1. The links of safety at sea handbook in English and local language

- Safety Recommendations for Decked Fishing Vessels of Less Than 12 meters in Length and Undecked Fishing Vessels FAO/ILO/IMO (for Myanmar)

<http://repository.seafdec.or.th/handle/20.500.12067/665>

- Safety Recommendations for Decked Fishing Vessels of Less Than 12 meters in Length and Undecked Fishing Vessels FAO/ILO/IMO (for Indonesia)

<http://repository.seafdec.or.th/handle/20.500.12067/664>

- Safety Recommendations for Decked Fishing Vessels of Less Than 12 meters in Length and Undecked Fishing Vessels FAO/ILO/IMO (for Viet Nam)

<http://repository.seafdec.or.th/handle/20.500.12067/663>

- Safety Recommendations for Decked Fishing Vessels of Less Than 12 meters in Length and Undecked Fishing Vessels FAO/ILO/IMO (for Cambodia)

<http://repository.seafdec.or.th/handle/20.500.12067/679>

- Safety Recommendations for Decked Fishing Vessels of Less Than 12 meters in Length and Undecked Fishing Vessels FAO/ILO/IMO (for Malaysia)

<http://repository.seafdec.or.th/handle/20.500.12067/680>

- Safety Recommendations for Decked Fishing Vessels of Less Than 12 meters in Length and Undecked Fishing Vessels FAO/ILO/IMO (for Thai)

<http://repository.seafdec.or.th/handle/20.500.12067/681>

2. The links of energy optimization guidelines in English and local language

- Energy Saving Measures and Rational Energy Consumption in Fishing Industry (for Cambodia)

<http://repository.seafdec.or.th/handle/20.500.12067/685>

- Energy Saving Measures and Rational Energy Consumption in Fishing Industry (for Indonesia)

<http://repository.seafdec.or.th/handle/20.500.12067/659>

- Energy Saving Measures and Rational Energy Consumption in Fishing Industry (for Malaysia)

<http://repository.seafdec.or.th/handle/20.500.12067/686>

- Energy Saving Measures and Rational Energy Consumption in Fishing Industry (for Myanmar)

<http://repository.seafdec.or.th/handle/20.500.12067/660>

- Energy Saving Measures and Rational Energy Consumption in Fishing Industry (for the Philippines)

<http://repository.seafdec.or.th/handle/20.500.12067/661>

- Energy Saving Measures and Rational Energy Consumption in Fishing Industry (for Thai)

<http://repository.seafdec.or.th/handle/20.500.12067/687>

- Energy Saving Measures and Rational Energy Consumption in Fishing Industry (for Viet Nam)

<http://repository.seafdec.or.th/handle/20.500.12067/662>

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

			Project ID: 201301003
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia		
Program Strategy No. :	I	Total Duration:	2015 - 2019
Lead Department:	Training Department (TD)	Lead Country:	Thailand
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD287,349
Project Partner:	None	Budget for 2019:	USD 50,850
Project leader:	Isara Chanrachkij / TD	Involved Country:	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

The project involves the identification of appropriate resource enhancement tools for the region in order to develop fisheries resource enhancement and habitat conservation measures/analysis and diagnosis of effectiveness of the measures and formulate strategies and guideline through the regional consultative meeting/workshop. Regional training programs on the theory and methodology of fisheries resource enhancement and habitat conservation measures will be conducted to build up capacity in ASEAN Member Countries for promote sustainable fisheries resources enhancement.

2. Background and Justification

Coastal waters of Southeast Asia are blessed with high productivity of fisheries resources because of rich ecosystems such as dense mangrove forests and seagrass beds sustained by rich effluence of nutrients from land, as well as extensive coral reefs with clean tropical sea environment. These areas are critical to a broad range of aquatic organisms during their life cycle from breeding, spawning, nursing and growing, hosting the feeding zones of aquatic species that are economically important, and serving as important source of recruitment of a wide diversity of fishery resources.

It is widely recognized that healthy marine environment is a prerequisite for sustainable marine fisheries production. Therefore, it is one of the most important responsibilities of fishery managers in the Southeast Asian Region to work for realization of good balance and relationship between human activity and coastal environment so that we can utilize marine fishery resources in a sustainable manner.

However, commercially important fishery resources in the region have declined due to many factors that include overfishing, illegal fishing, use of destructive fishing practices, and environmental degradation. Massive clearance of mangrove forests for aquaculture, urbanization, industrialization, wood fuel, timber and the like, could bring about large temporary economic benefits to certain groups of people or governments but in the end, the breeding, nursery and feeding areas of many aquatic species such as fishes, crustaceans, and mollusks might be destroyed and lost.

Furthermore, the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 “Fish for the People 2020: Adaptation to a Change Environment”, held in June 2011, adopted a resolution recommending that “*optimize the use of inshore waters through resources enhancement programs such as promoting the installation of artificial reefs and structures, encouraging coordinated and effective planning for coastal fisheries management programs, undertaking environmental impact assessment studies, restocking of commercially-important fish species, as appropriate, and give priority to human resources development for the implementation of such programs*”. Then, project on Promotion of sustainable fisheries resources enhancement measures in critical habitats/fishing grounds in Southeast Asia is necessary for SEAFDEC Member Countries.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: Information gathering on fisheries resources enhancement and habitat conservation measures in Southeast Asia	Outcome 1: Application and verification of various methodologies for quantitative assessment, monitoring and evaluation of the effectiveness of resources enhancement initiatives.	Output 1: Mapping of important critical fishing grounds and habitats and associated fish species.	Activity 1: Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices Sub-activity 1.1: Investigation/review of the status of critical habitats/fishing grounds in the Southeast Asian region Sub-activity 1.2: Information collection on suitable designs of resource enhancement practices including their evaluation and promotion Sub-activity 1.3: Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation
Objective 2: Human resources development for implementation of fisheries resources enhancement and habitat conservation measures	Outcome 2: Strengthen and developed of human capacity in fisheries resources enhancement and habitat conservation	Output 2: Regional training programs on fisheries resource enhancement and habitat conservation measures as well as technical transferring through the technical assistance in a pilot site implementation.	Activity 2: Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds. Sub-activity 2.1: Technical assistance in a pilot site for suitable designs of resource enhancement practices. Sub-activity 2.2: Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management. Sub-activity 2.3: Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures.
Objective 3: Disseminating and promoting fisheries resources enhancement and habitat conservation measures suitable for Southeast Asia	Outcome 3: Rising awareness of resources users on the important of fisheries resources enhancement and habitat conservation	Output 3: Publication of the promotion materials on importance of fisheries resources enhancement and habitat conservation	Activity 3: Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices	Under this activity will composed of investigation of the existing basic information and research works in identifying the critical fishing grounds as well as spawning and nursery grounds known also as "Fishery <i>Refugia</i> " for commercial fishes including bottom and pelagic species, will be conducted. Information collection would be conducted through deskwork and visit to the Member Countries. The results of the information gathering will be used for mapping and assessment by indices of the status of the critical fishing grounds in the region.

Activity	Description
	<p>Activity will conceptual on the investigation of existing information and research works on the effective designs/models and methodologies for the resource enhancement tools/practices used in various fisheries habitat will be conducted. Information collection would be conducted through deskwork and designs/models experiment.</p> <p>This activity includes workshops as well as expert consultations to identify appropriate and effective resources enhancement tools and measures for fishery resources enhancement and habitats conservation and other related activities.</p>
<p>Activity 2 Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds</p>	<p>In this activity, selected onsite study and evaluation on enhancement practices including artificial reefs impact to fisheries resources and environment are conducted in selected pilot project site of Member Countries. The pilot site selection will be decided following the discussion at the project inception workshop.</p> <p>In order to develop strategies and actions in rehabilitating the critical fishing grounds as practical management measures, critical fishing grounds will be selected for diagnosing fishing grounds and monitoring the achievements of rehabilitation program in selected pilot sites such as seagrass beds for fisheries resources in Member Countries. The pilot site selection will be decided following the discussion at the project inception workshop.</p> <p>Also Case studies on the selected priority important fisheries ecosystem identified and evaluated in cooperation with Member Countries, will be conducted including a case study by SEAFDEC on identification and evaluation of fisheries ecosystem in the fresh water reservoir in Member Countries.</p> <p>Capacity building on theory and methodology of fisheries resources and habitats/fishing grounds would be provided through a training course and study trip to transfer of assistance both in terms of technical and management aspects to Member Countries in order to enhance their capacities and awareness of fishery resources rehabilitation and habitats/fishing grounds practices.</p>
<p>Activity 3 Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region</p>	<p>Documentation of the best practices of the project implementation will be carry out, which can be used as inputs in the preparation of IEC (information, education and communication) materials for dissemination in the region.</p> <p>The regional seminar is primarily aimed at reviewing the impact of project and disseminating the modality of the project operation and resultant outcomes to other SEAFDEC Member Countries. The project activities and its outcomes during its 4.5 years' implementation are described in detail by the responsible parties. In addition, the impacts of the respective activity and expected follow-up actions after the termination of the project are also highlighted.</p>

3.3 Activity, Sub-activity and Proposed Budget for 2014-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2014	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
Activity 1: Development on diagnoses of critical fishing grounds and	Sub-activity 1.1 Investigation/review of the status of critical habitats/ fishing grounds in the Southeast Asian region		0	0	5,360	30,000	18,360

Activity	Sub-Activity	Y1 2014	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
evaluation by resources enhancement practices	Sub-activity 1.2: Information collection on suitable designs of resource enhancement practices including their evaluation and promotion		0	1,500	2,780	5,542	0
	Sub-activity 1.3: Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation		0	0	0	35,000	0
Activity 2: Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds	Sub-activity 2.1: Technical assistance in a pilot site for suitable designs of resource enhancement practices		9,500	8,000	4,360	10,243	31510
	Sub-activity 2.2: Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management		27,700	20,000	27,860	15,000	0
	Sub-activity 2.3: Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures		0	0	0	30,000	0
Activity 3: Promotion and extension on rehabilitation of fisheries resources and habitat/fishing grounds in ASEAN Region	Sub-activity 3.1: Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness		1,000	560	1,000	1,094	980
	Sub-Total Budget		38,200	30,060	41,360	126,879	5,850

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

In order to develop strategies and actions in rehabilitating the critical fishing grounds as practical management measures, critical fishing grounds will be selected for diagnosing fishing grounds and monitoring the achievements of rehabilitation program in selected pilot sites for fisheries resources in Member Countries. Capacity building on theory and methodology of fisheries resources and habitats/fishing grounds would be provided through a training course of Fish Enhancing Devices (FEDs) and human resources development on the hatchery techniques for enhance crab resource has provide to local fishers and local fisheries officers in Kep province. Study trip to transfer of assistance in terms of

technical and management aspects to Cambodia research in order to enhance their capacities and awareness of crab fishery resources rehabilitation in sea grass fishing grounds. Survey reports on the designs, material and construction of FEDs and mapping of important fishing grounds and habitats on FEDs installation in Thailand. Report on the Study on Enhancement of Sustainable Management of the Blue Swimming Crab Fisheries in Kep will be disseminated to Member Countries. Rising awareness of resources users on the important of fisheries resources enhancement and habitat conservation. Publication of the promotion materials on importance of fisheries resources enhancement and habitat conservation.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1					
Sub-activity 1.2 Information collections on suitable designs of resource enhancement practices including their evaluation and promotion				108 (70)	20,000
Sub-activity 1.3 Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation This activity includes workshops as well as expert consultations to identify appropriate and effective resources enhancement tools and measures for fishery resources enhancement and habitats conservation.		20	4		
Activity 2					
Sub-activity 2.2 Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management.					
Activity 3					
Sub-activity 3.1 Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness			2	30	2,250

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.1	Survey reports on the designs, material and construction of FEDs	Information on the designs, material and construction of FEDs and mapping of important fishing grounds and habitats on FEDs installation in Thailand as the reference to SEAFDEC MCs to select appropriate design and implement.
Sub-activity 1.2	Report on the training course	Report on the training course on design, material and construction of FEDs and evaluation on the impact of

Planned activity	Expected outcome/output	Achievements
		FED installation for sustainable fisheries resource enhancement and habitat conservation Includes the way forward of national level.
Activity 2		
Sub-activity 2.2 Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management.		Experience and lesson learnt on the co-management on fisheries resources enhancement through development and implement of crab bank, conservation zone in Kep Province of Cambodia Hatching facilities (Selection of sites, design and construction of the hatching facilities) and introduction of hatching technology. Collaborative stakeholder agree to set up hatchery system to hatch and releasing juvenile blue swimming crab at off-coast of Angkaul village. Conservation zone in Kep Province of Cambodia.
Activity 3		
Sub-activity 3.1		Article in the proceeding of the International Conference on Fisheries Engineering 2019 (ICFE 2019)

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
1. (Draft) Report on the Environmental and Socioeconomic Impact of the FEDs (Fish Enhancing Devices) in Coastal Area. (Under developing due to the project will finish in December 2019)	Hard Copy	
2. Presentation on the environmental impact of the FEDs (Fish Enhancing Devices) in Coastal Area.	Power Point Presentation	
3. Report on the training course on design, material and construction of FEDs and evaluation on the impact of FED installation for sustainable fisheries resource enhancement and habitat conservation Includes the way forward of national level.		
4. Report on the Conservation zone in Kep Province of Cambodia.	Hard Copy	
5. Signboard to promote the Crab bank facilities and conservation zone off-coast of Angkaul village, Kep Province of Cambodia.	Board	
6. Article in the proceeding of the International Conference on Fisheries Engineering 2019 (ICFE 2019, 21 to 24 September 2019)	Hard Copy and Power Point Presentation	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1	Local community request to SEAFDEC conduct the research on alternative material of FEDs Information from the study include the impact of environment and socioeconomic of the deployment of rope FEDs and its guideline to study impact of rope FEDs to the ecosystem
Sub-activity 1.2	Waiting for the result of the training activities than planning to conduct in November 2019

Planned activity	Evaluation/ Views from Participants
Activity 2	
Sub-activity 2.2	The project will terminate in year 2019. In General, FiA Cambodia is promoting ecosystem approach to fisheries management. To solve with the issue on the crab fisheries resources in Kep province, SEAFDEC support the FiA Cambodia to improve collaboration between local government and fishers in Angkaul village, Kep Province of Cambodia. Local stakeholder agreed and cooperate with government and SEAFDEC to enhance crab resources by using crab bank method and the demarcation of conservation zone.
Activity 3	
Sub-activity 3.1	SEAFDEC researcher will participate in national and international conference in year 2020 in order to present result of project

6. Major Impacts/Issues

The project is going to terminate in 2019. All activities in 2019 are to summarize the result of working in year 2014-2018. In addition, way forward and direction of the project implement in 2020 is needed to finalize and prepare for implement during the new JTF Manager.

Fisheries resources enhancement need to improve in SEAFDEC Member Countries in different tools and practices. The project has already preliminary identified need of each SEAFDEC Member Countries. Summarizing issues of implementation of resource enhancement in SEA region is the requirement on scientific data to determine effectiveness resource enhancement, Stakeholder involvement in enforcement and compliance initiatives leading to greater compliance, Effective enforcement and greater overall cost of surveillance and management require advanced technological capabilities which are costly. There is the major hindrance of technical constraint that need to support by SEAFDEC, or the sharing experience among SEAFDEC Member Countries facilitate by SEAFDEC. The impact on the installation of Artificial reef and Fish Enhancing Devices needs to investigate and extend the knowledge to MCs. Impact of the fisheries resources degradation always relevant with economic issue poverty issues. With that the resource enhancement always need socioeconomic study and improvement of appropriate fisheries management approach. The project needs multidisciplinary research to improve that program.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

Achievements of the project were aimed to support the Policy Recommendations and Strategic Plans of Action for the Implementation of Fisheries Resources Enhancement Activities in the Southeast Asia Region has adopted by ASEAN Member States in 2015. SEAFDEC is collaborative. Lesson learn and experience of the field officer the main achievement is success of the establishment of hatchery facility of crab bank and conservation zone in Kep province and dog conch shell resource management measures in Krabi Province, Thailand. Ecosystem approach to fisheries management by using co-management and participatory approach between local fishers, local fisheries administration and central fisheries administration is key lesson learn to enhance skill and experience of coastal stakeholder to co-managing fisheries resources. One of the recommendations of Policy Recommendations and Strategic Plans of Action is the support on the implementation, monitoring and evaluation of artificial habitat installation need to implement and disseminate the result including with reference to the SEAFDEC Member Countries. Project will come up with the guideline to investigate environment and socioeconomic impact of the artificial habitat installation.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1 Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices	The activities will composed of investigation of the existing basic information and research works in identifying the critical fishing grounds as well as spawning and nursery grounds known also as "Fishery <i>Refugia</i> " for commercial fishes including bottom and pelagic species, will be conducted.

List of Activities	Description of Implemented Activities
	Information collection would be conducted through the research survey. The results of the information gathering will be used for identifying the environmental and socioeconomic impact of the installation of artificial habitat
Activity 2: Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds	Activity will conceptual on the investigation of existing information and research works on the effective designs/models and methodologies for the resource enhancement tools/practices used in various fisheries habitat will be conducted. Information collection on crab resources in Cambodia and stakeholder consultations on the management to elaborate responsibility of stakeholders and fishers in the management plan.
Activity 3	Documentation of the best practices of the project implementation will be carry out, which can be used as inputs in the preparation of IEC (information, education and communication) materials for dissemination in the region. Researcher of SEAFDEC will participate in the international seminar/conference is primarily aimed at reviewing the impact of project and disseminating the modality of the project operation and resultant outcomes. The project activities and its outcomes during its implementation is described in detail by the responsible parties. In addition, the impacts of the respective activity and expected follow-up actions after the termination of the project are also highlighted.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1	Survey reports on the designs, material, construction and recommendation on the good practices and management of FEDs installation in Thailand. Report of the study of environment and socioeconomic of the deployment of rope FEDs and its guideline to study impact of FEDs to the coastal ecosystem.
Activity 2	Experience and lesson learnt on the co-management on fisheries resources enhancement though development and implement of crab bank, conservation zone in Kep Province of Cambodia. The hatching facilities (Selection of sites, design and construction of the hatching facilities) and introduction of hatching technology has been agreed by the participatory approach by using stakeholder consultation to set up hatchery system to hatch and releasing juvenile blue swimming crab at offcoast of Angkaul village. Conservation zone in Kep Province of Cambodia is develop in the similar process of crab bank.
Activity 3	Publication as result of research studies, <i>i.e.</i> environmental and socioeconomic impact of the installation of artificial habitat, project implementation on establishment of crab bank and conservation as tools for co-managing of the rehabilitation of crab resources, material and design of FED in Thailand, and artificial habitat definition will disseminate through the publication website and presentation to conference or seminar. SEAFDEC researcher will participate in national and international conference in year 2020 to present results of project to MCs and the global.

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Regarding the restructure of Training Department of SEAFDEC effective in April 2017, Research and Development Division, the delay on implementation of JTF Project on “Promotion of sustainable fisheries resources enhancement measures in critical habitats/fishing grounds in Southeast Asia” and the work plan in the year 2017 has been revised into two main resources enhancement tools, *i.e.* Fish Enhancing Devices and Crab bank (crab resource enhancement) Regarding to the Policy Recommendations and Strategic Plans of Action for The Implementation of Fisheries Resources Enhancement Activities In The Southeast Asian Region (Adopted on 30 July 2015 and Endorsed by the 25th ASWGF_i), fisheries resources enhancement should implement through participatory approach and co-managing between the local fishers and government sectors. That makes project need longer time with financial support by both project and national government. Period of the implementation should may require more than 5 years period. Guideline to conduct research study on the impact of artificial habitat needs implement in countries.

5. Publications and Others

- Presentation and document on the Policy Recommendations and Strategic Plans of Action for the Implementation of Fisheries Resources Enhancement Activities in the Southeast Asian Region (Adopted on 30 July 2015 and Endorsed by the 25th ASWGF_i) presented in the 25th ASWGF_i)
- Report on the Methodologies to Introduce and Manage the Effective Fish Enhancing Devices (FEDs)
- Study on the Need Assessment in Fisheries Resource Enhancement project presented in the Regional Technical Meeting on Fisheries Resource Enhancement in Southeast Asia Bangkok, Thailand, 24-26 April 2018 (Presentation file)
- Term and Definition of Artificial Habitats Artificial Reefs (ARs), Fish Aggregating Devices (FADs) Fish Enhancing Devices (FEDs) presented in the Regional Technical Meeting on Fisheries Resource Enhancement in Southeast Asia Bangkok, Thailand, 24-26 April 2018 (Presentation file)
- (Ongoing) Report on the Enhancement of Sustainable Management of the Blue Swimming Crab Fisheries in Kep Province, Cambodia
- (Ongoing) Report of the study of environment and socioeconomic of the deployment of rope FEDs and its guideline to study impact of FEDs to the coastal ecosystem.

PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2019

			Project ID: 201503002
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia		
Program Strategy No.:	I	Total Duration:	2015-2019
Lead Department:	Inland Fishery Resources Development and Management Depart (IFRDMD)	Lead Country:	Indonesia
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 248,020
Project Partner:	None	Budget for 2019:	USD 41,080
Project Leader:	Ms. Ni Komang Suryati / IFRDMD	Project Participating Country(ies) :	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

This project is aimed at enhancing the sustainability of catadromous eel resources in Southeast Asia (hereinafter it is to be called “the region”). There are three main activities on the project. The first one is aims at clear understanding on current situation of resources, fisheries and utilization of catadromous eels in the region. The second one is aims at improving data collection and statistics of catadromous eel catch in ASEAN Member States (hereinafter referred to as “AMS”). The third one is aims at enhancing knowledge and capacity in AMSs for the conservation, management and sustainable utilization of catadromous eel resources.

In particular, lack of data and statistics on tropical eel species may bring negative impact to the fisheries sectors. Various kind of information about the tropical eels should be collected through a variety of sources, including the fishing activities (catch statistics), biological surveys and from the beneficiaries (traders, consumers and so on).

2. Background and Justification

With the rapid decline of temperate eels, the market value of tropical eels rises in recent years. Glass eel (juvenile of eel) capture fisheries in tropical zone increase dramatically. In order to avoid the over exploitation on glass eel, the Indonesian government issued the regulation to prohibit export of eel seeds less than 150 g from Indonesia’s territory. The similar policies to prohibit export of eel seeds are enforced in some other countries. Conservation and management policy issues on tropical eel resources for their sustainability become more important not only in Indonesia but also in the region. Therefore, the region needs a policy to balance between utilization and sustainability of tropical eel resources. At the same time, we should consider that we just have quite limited knowledge on tropical eel species in this region yet.

The main objectives of this project are to find out the current status of eel fisheries, to develop the data collection methods and statistical data on fisheries production, and to promote the management plans for conservation and sustainable use of tropical eel resources. The Goals of the project are construction of guidelines on conservation, management and sustainable utilization of catadromous eel resources in the region.

3. Overall Project Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objectives	Outcomes	Outputs	Activities
<p>Objective 1:</p> <p>Having clear understanding on the present status of resources, fisheries and utilization of catadromous eels in the region</p>	<p>Outcome 1:</p> <p>Understanding the present status on catadromous eel resources in the region. It would be a valuable source for considering of the conservation measures on tropical eel in the latter half of this project.</p>	<p>Output 1:</p> <ul style="list-style-type: none"> Grasping the present status of fisheries, commercial distribution and the trades of catadromous eel in the region. 	<p>Activity 1.</p> <p>Clear understanding on current situation of resources, fisheries and utilization</p> <p>Sharing and exchanging information on catadromous eels in the region among AMS through a workshop focusing on its fisheries.</p> <p>Collecting the basic information and data by surveying on eel fisheries for clear understanding on the present status and intensity of eel fisheries including glass eel fishery.</p> <p>Finding out the present status of eel trade and market in AMS through interviewing the stakeholders on commercial distribution and trade on tropical eels.</p>
<p>Objective 2:</p> <p>Improving data collection and statistics of catadromous eel catch in AMS</p>	<p>Outcome 2:</p> <p>Improving the method of data collection on eel fisheries in the region, with mutual understanding of the differences and similarities on eel fisheries at each AMS.</p>	<p>Output 2:</p> <ul style="list-style-type: none"> Improving the species identification technique on genus <i>Anguilla</i> in the region. Gathering continuous data on eel fisheries and trades in AMS with accuracy. Finding out the appropriate methods/measures to collect statistics on eel fishery in the region. 	<p>Activity 2.</p> <p>Improvement of data collection and statistics on eel fisheries</p> <p>Conducting studies on species identification based on DNA technology, including the training of handling genetic information.</p> <p>Developing the basic methodologies of data collection for catch/trade statistics on eel in AMS.</p> <p>Having a discussion how to develop data collection methodologies for eel statistics among AMS.</p>

Objectives	Outcomes	Outputs	Activities
<p>Objective 3:</p> <p>Enhancing knowledge and capacity of AMS for conservation, management and sustainable utilization of catadromous eel resources</p>	<p>Outcome 3:</p> <p>Promoting the appropriate management of eel fisheries for the sustainable use of tropical eel resources in the region.</p>	<p>Output 3:</p> <ul style="list-style-type: none"> • Finding important causes and factors that wreak the negative impact on tropical eels then seeking the mitigating measures. • Constructing guidelines on eel fishery in the region. • Disseminating the results of this project and also proposing guidelines/policy recommendation on eel fisheries among AMS. 	<p>Activity 3.</p> <p>Promotion of conservation, management and sustainable utilization</p> <p>Conducting research in several waters in the region regarding the negative impact of environmental changes on catadromous eel resources and seeking measures for mitigation from the damages.</p> <p>Compiling all the results of the activities done under the project into the guidelines on conservation, management and sustainable utilization of catadromous eel resources in the region.</p> <p>Having a workshop for dissemination of the outcomes from this project and developing a policy recommendation on the sustainable use of catadromous eel resources in the region. The summarization of the appropriate methods/measures to collect statistics on eel fishery in the region (Activity 2) will also be conducted in this workshop.</p>

3.2 Overall Scope/Description of Project

Activity	Description
<p>Activity 1</p> <p>Clear understanding on current situation of resources, fisheries and utilization</p>	<ul style="list-style-type: none"> • Sharing and exchanging information on catadromous eels in the region among AMS through a workshop focusing on its fisheries that participating. Although it was originally scheduled on latter half of 2015, it was postponed to April 2016 considering the conveniences of the participants. (Sub-activity 1.1) • Collecting the basic information and data by surveying on eel fisheries in AMS for clear understanding on present status and intensity of eel fisheries including glass eel fishery in the region. The surveys will be carried out during the years of 2015 to 2019. (Sub-activity 1.2. <i>To keep monitoring the fishing conditions of eels that would not be covered by JAIF project, this sub-activity is extended till 2019, originally planned to complete in 2017 though.</i>) • Finding out the present status of eel trade and market in AMS through interviewing the stakeholders on commercial distribution and trade on tropical eels. The surveys will also be conducted during the years of 2015 to 2019 in AMS. (Sub-activity 1.3. <i>To keep monitoring the trend of eel trading that would not be covered by JAIF project, this sub-activity is extended till 2019, originally planned to complete in 2017 though.</i>)

Activity	Description
Activity 2 Improvement of data collection and statistics on eel fisheries	<ul style="list-style-type: none"> • Conducting studies on species identification among the genus <i>Anguilla</i> in AMS based on DNA technology. It includes the training of handling genetic information. This activity will be carried out during the years of 2015 to 2017. (Sub-activity 2.1) • Developing the basic methodologies of data collection for catch/trade statistics on eel in AMS. The study on data collection methodologies will be conducted during the years of 2016 to 2017. (Sub-activity 2.2)
Activity 3 Promotion of conservation, management and sustainable utilization	<ul style="list-style-type: none"> • Conducting research in several waters in AMS, regarding the negative impact of environmental changes on catadromous eel resources and seeking measures for mitigation from the damages. This activity will be carried out during the years of 2017 to 2019. (Sub-activity 3.1) • Compiling all the results of the activities done under the 4-year project into the guidelines on conservation, management and sustainable utilization of catadromous eel resources in the region. Having a workshop for dissemination of the outcomes from this project and developing a policy recommendation on sustainable use of catadromous eel resources in the region at the end of the project (2019). (Sub-activity 3.3) The summarization of the appropriate methods/measures to collect statistics on eel fishery in the region (originally planned as Sub-activity 2.3) will also be conducted in this workshop.
Activity 4 Coordination by the project leader	<ul style="list-style-type: none"> • The project leader coordinates and encourages the research, and dissemination.

3.3 Activity, Sub-activity and Proposed Budget for 2015-2019)

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 1: Clear understanding on the current situation of resources, fisheries and utilization	Sub-activity 1.1: Workshop to exchange information on catadromous eels in the region	18,000 (carry forward to 2016)				
	Sub-activity 1.2: Survey on trends of catadromous eel fisheries	8,000	12,000	8,000	10,000	5,380
	Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels	8,000	9,000	8,000	15,000	2,200
Activity 2: Improvement of data collection and statistics on eel fisheries	Sub-activity 2.1: Study on catadromous eel species identification by DNA technology	8,000	12,000	8,000	35,000	5,000
	Sub-activity 2.2: Study on statistical data collection methodologies		9,000	8,000	10,000	

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 3: Promotion of conservation, management and sustainable utilization	Sub-activity 3.1: Study on elements negatively impacting catadromous eel resources and mitigating measures			10,000	10,940	3,000
	Sub-activity 3.2: Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources					8,690
	Sub-activity 3.3: Workshop to develop policy recommendation on the sustainability of catadromous eel resources in the region (incl. the summarization of the appropriate methods/measures to collect statistics on eel fishery in the region)					12,702
Activity 4: Coordination by the project leader	The project leader will coordinate and assist all researches and dissemination that will be supported by one assistant who hires to carry out the project effectively.					4,108
Sub-Total Budget		42,000	42,000	42,000	80,940	41,080

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year 2019

IFRDMD has conducted six sub-activities under three main activities (Activity 1, 2 and 3) in 2019. Under these sub-activities, the result indicates that very limited Member Countries provide national statistical data on tropical anguillid eels. However, a series of data were collected from Myanmar, Indonesia, the Philippines and Viet Nam as a baseline to be explored. Description of data includes trend of each country were plotted to indicate their status and trends of harvesting. Eel samples that exist in Southeast Asia (Indonesia, Myanmar and the Philippines) have been identified. There are six species/subspecies identified namely *Anguilla bicolor bicolor*, *A. bicolor pacifica*, *A. marmorata*, *A. bengalensis*, *A. interioris* and *A. luzonensis*. We continuously got the preliminary information regarding the relationship between upward migration of eels and the artificial constructions from one hydropower dam in Indonesia that already applies fish ladder. It is PLTA Poso II which is located in Poso river and operated by PT. Poso Energy. In 2019, this company restocked 200 kg elvers in Peura village Poso lake. On September 2019, they have plan to restock silver eels at the river mouth of Poso.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1: Clear understanding on current situation of resources, fisheries and utilization					
Sub-activity 1.2: Survey on trends of catadromous eel fisheries	I: Research	20(12)	12(7)		5,380
Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels	I: Research	20(12)	12(7)		2,200
Activity 2: Improvement of data collection and statistics on eel fisheries					
Sub-activity 2.1: Study on catadromous eel species identification by DNA technology	I: Research	2(1)	2(2)		5,000
Activity 3: Promotion of conservation, management and sustainable utilization					
Sub-activity 3.1: Study on elements negatively impacting catadromous eel resources and mitigating measures	I: Research	20(12)	12(7)		3,000
Sub-activity 3.2: Developing guidelines on conservation, management and sustainable utilization of catadromous eel resources	I: Research	23(4)	19(10)		8,690
Sub-activity 3.3: Workshop to develop policy recommendation on the sustainability of catadromous eel resources in the region	I: Research	23(4)	19(10)		12,702
Activity 4: Coordination by the project leader					
Sub-activity 4.1: The project leader will coordinate and assist all researches and dissemination that will be supported by one assistant who hires to carry out the project effectively.	VI: Others	2(1)	17(9)		4,108
					41,080

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcomes/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1: Clear understanding on current situation of resources, fisheries and utilization		
Sub-activity 1.2 Survey on trends of catadromous eel fisheries	Understanding of the present status and recent trend of eel fisheries and eel resources in the region.	IFRDMD gets the present status and recent trend of eel fisheries and eel resources in the region. National landing data reported to FAO global fishery and aquaculture production statistics (2019), indicates that two countries, <i>i.e.</i> Indonesia and the Philippines played a

Planned activity	Expected outcome/output	Achievements
		<p>significant role in river eels fisheries landing in this region. The estimate reported landing from 1980 to 2017 showed that Indonesia increased and fluctuated since 1990, while the Philippines steadily increased since 2000 then gradually decreased after 2013</p> <p>Indonesia:</p> <ul style="list-style-type: none"> - Scatter plot between catch and number of fishers showed there is no significant trend and uncertain of abundance occurs during the last five years in Palabuhan Ratu. Trend CPUE (kg/fishers) within a period of 2013 – 2017 indicated negative slope with low correlation and excluding data of 2018. - Series of elver and yellow eel were available in Poso lake and its adjacent waters. Fifteen years of harvesting data indicate the volume tends to decrease in the last two years. Special attempt should be carried out in monitoring of monthly harvest volume data. The maximum volume of monthly harvest tends to decrease, while the average relatively stables then decrease since 2017. Estimation of CPUEs was not available due to limited data on effort. <p>Myanmar:</p> <ul style="list-style-type: none"> - The data structure in Myanmar was available from 2017 to 2018 and 2019 up early of 2019. No of observation varied between those two years, and several monthly data were not available in each year. However, the total estimated catch was relatively at the same volume. Clarification on the different number of observation and missing data would be interested in explaining the high uncertainties on data quality. <p>The Philippines:</p> <ul style="list-style-type: none"> - Plotting estimate CPUE to several fishers showed that there is no clear indication on status and trend of this glass eel fishery, both of fishers and catch in the last three years were lower compared in the previous years. However, there is a general trend of high number of active fishers tend to proportionally in-line with an increasing total catch. - Experimental fishing was carried out as an effort to standardize estimate CPUE in the Philippines. Data in yearly

Planned activity	Expected outcome/output	Achievements
		<p>scale indicates that estimate CPUE by fishers (13 – 89 kg) and by an hour (2 – 11 kg) as an indicator of abundance. This approach is very helpful to estimate status and trend based on core sampling of fishing methods. The result could be arranged as a representative standard effort for a longer period of observations and considered as an indicator of glass eel abundance in the area.</p> <p>- Further information on a low number of active fishers occurs in the average last three years (642) compare the average of 2007 to 2011 (around 2500) would be interesting to investigate, whether fishers leave the fisheries due to another source of livelihood or low probability of harvest rate on glass eel fishery. A short study on the socio-ecological system of eels fishers should be investigate to, particularly the dynamic of part-time fishers which probably in and out from fisheries seasonally.</p> <p>Viet Nam:</p> <p>- The data structure in Viet Nam was available from Jan 2018 up early of 2019. No of observation varied between those two years, and several monthly data were not available in each year. Clarification on the different number of observation and missing data would be interested in explaining the high uncertainties on data quality</p>
<p>Sub-activity 1.3 Survey on commercial distribution/trade of catadromous eels</p>	<p>Understanding the amount and route of trading of eel in AMS.</p>	<p>IFRDMD gets clear information regarding the amount and route of trading of eel that exist in Indonesia, Philippines, Viet Nam, Myanmar, and Thailand. Another source of export data is available globally. The general export data of river eels nei and elver live showed that Indonesia (ID), Myanmar (MM) and Philippines (PH) play a significant role in the region. Export tends to decrease in 2013 for Indonesia and 2014 for Myanmar and the Philippines. The major contribution after 2010 were Myanmar and the Philippines</p>
<p>Activity 2:</p>		
<p>Improvement of data collection and statistics on eel fisheries</p>		
<p>Sub-activity 2.1 Study on catadromous eel species identification by DNA technology</p>	<p>The establishment of the method of species identification on genus <i>Anguilla</i> by DNA analysis.</p>	<p>Eel samples that exist in Southeast Asia (Indonesia, Myanmar and the Philippines) have been identified. There are five species ; <i>Anguilla bicolor bicolor</i>, <i>A. bicolor pacifica</i>, <i>A. marmorata</i>, <i>A. bengalensis</i>, <i>A. interioris</i> identified based the result study conducted in Indonesia (Pelabuhan ratu,</p>

Planned activity	Expected outcome/output	Achievements
		Aceh, Tasik Malaya, Bengkulu and Poso). Three species <i>A. bicolor pacifica</i> , <i>A. marmorota</i> and <i>A. luzonensis</i> , were identified based on the the result study conducted in Philippines. There was only one species, <i>A. bicolor bicolor</i> , identified in Myanmar.
Activity 3:		
Promotion of conservation, management and sustainable utilization		
Sub-activity 3.1: Study on elements negatively impacting catadromous eel resources and mitigating measures	Conducting research in several waters in AMS, regarding the negative impact of environmental changes on catadromous eel resources and seeking measures for mitigation from the damages.	IFRDMD continuously got the information regarding the relationship between upward migration of eels and the artificial constructions from one hydropower dam in Indonesia that already applies fish ladder. It is PLTA Poso II which is located in Poso river and operated by PT. Poso Energy. In 2019, this company restocked 200 kg elvers in Peura village Poso lake. On September 2019, they have plan to restock silver eels at the river mouth of Poso.
Sub-activity 3.2: Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources	Constructing guidelines on eel fishery in the region and disseminating through workshop.	IFRDMD will make a guidelines on identification of anguillid eel species in AMS and holding a workshop of five-year achievement of JTF VI by IFRDMD, Jakarta, Indonesia, October 2019. The participants come from all Member Countries, Japan and SEAFDEC.
Sub-activity 3.3: Workshop to develop policy recommendation on the sustainability of catadromous eel resources in the region	Disseminating the results of this project and proposing guidelines/policy recommendation on eel fisheries among AMS.	Holding a workshop of five-year achievement of JTF VI by IFRDMD, Jakarta, Indonesia, October 2019. The participants come from all Member Countries, Japan and SEAFDEC.
Activity 4:		
Coordination by the project leader		
Sub-activity 4.1: The project leader will coordinate and assist all researches and dissemination that will be supported by one assistant who hires to carry out the project effectively.	Project management to lead to success	Progress meetings twice a year. The evaluation at the end of year by experts. Hiring one assistant to carry out the project effectively.

4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
Addressing the Issues and Concerns on Anguillid Eel Fisheries in Southeast Asia.	Fish For the People Vol. 17 No.01	http://www.seafdec.org/download/fish-for-the-people-vol-17-no-1/

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1 Clear understanding on current situation of resources, fisheries and utilization	
Sub-activity 1.2: Survey on trends of catadromous eel fisheries	There was no evaluation from the participants of AMS.
Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels	There was no evaluation from the participants of AMS.
Activity 2 Improvement of data collection and statistics on eel fisheries	
Sub-activity 2.1: Study on catadromous eel species identification by DNA technology	There was no evaluation from the participants of AMS.
Activity 3 Promotion of conservation, management and sustainable utilization	
Sub-activity 3.1: Study on elements negatively impacting catadromous eel resources and mitigating measures	There was no evaluation from the participants of AMS.
Sub-activity 3.2: Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources	Not yet conducted.
Sub-activity 3.3: Workshop to develop policy recommendation on the sustainability of catadromous eel resources in the region	Not yet conducted.

6. Major Impacts/Issues

IFRDMD establishes and improves the catch statistics on anguillid eels in Indonesia, Philippines Myanmar, and Viet Nam. It needs to find out the critical issues regarding the stock assessment to achieve the sustainable use of anguillid eel resources, before considering the several concrete management measures.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

During 5-year implemented the project, IFRDMD conducted the field surveys to find out the present status of anguillid eel fisheries in AMS. The result indicates that very limited Member Countries provide national statistical data on tropical anguillid eels. However, a series of data were collected from Myanmar, Indonesia, the Philippines and Viet Nam as a baseline to be explored. Description of data includes trend of each country were plotted to indicate their status and trends of harvesting. Eel samples that exist in Southeast Asia (Indonesia, Myanmar and the Philippines) have been identified. There are six species/subspecies identified namely *Anguilla bicolor bicolor*, *A. bicolor pacifica*, *A. marmorata*, *A. bengalensis*, *A. interioris* and *A. luzonensis*. To enhance the capacity building, IFRDMD dispatched the researchers to attend the appropriate training, join the relevant meetings, and coordinate the in-house training. The dissemination of the result of researches was done by being the presenter or lecturer in the conferences. The first Workshop on Enhancement of Sustainability of Catadromous Eel Resources in South East Asia in 2016 was held to review the achievements of Catadromous eel research's; to provide the database of Catadromous eel; and to discuss the strategic framework for collecting eel fisheries statistic. At the end of project duration, IFRDMD organized the Workshop on 5-year of IFRDMD's Achievement for reviewing the result of the department and getting the improvement of eel fisheries study from AMSs.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1 Clear understanding on current situation of resources, fisheries and utilization	
Sub-activity 1.1: Workshop to exchange information on catadromous eels in the region	Holding the Workshop to exchange information on catadromous eels in the region
Sub-activity 1.2: Survey on trends of catadromous eel fisheries	Information gathering by referring to the literature, web sites, interviewing and field surveys on the present status of trend catadromous eel fisheries in AMS
Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels	Information gathering by referring to the literature, web sites, interviewing and field surveys on the present status of commercial distribution/trade of catadromous eels in AMS
Activity 2 Improvement of data collection and statistics on eel fisheries	
Sub-activity 2.1: Study on catadromous eel species identification by DNA technology	Information of genetic study by collecting the sample of catadromous eel in AMS
Activity 3 Promotion of conservation, management and sustainable utilization	
Sub-activity 3.1: Study on elements negatively impacting catadromous eel resources and mitigating measures	Information gathering by referring to the literature, web sites, interviewing and field surveys on the elements negatively impacting catadromous eel resources and mitigating measures in AMS
Sub-activity 3.2: Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources	Organizing a workshop to develop guidelines on conservation, management and sustainable utilization of catadromous eel resources
Sub-activity 3.3: Workshop to develop policy recommendation on the sustainability of catadromous eel resources in the region	Organizing a workshop to develop to develop policy recommendation on the sustainability of catadromous eel resources in the region
Activity 4 Coordination by the project leader	
The project leader will coordinate and assist all researches and dissemination that will be supported by one assistant who hires to carry out the project effectively.	Progress meetings twice a year. The evaluation at the end of year by experts. Hiring one assistant to carry out the project effectively.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1 Clear understanding on current situation of resources, fisheries and utilization	
Sub-activity 1.1: Workshop to exchange	SEAFDEC/IFRDMD was held the 1 st Workshop on Enhancement of Sustainability of Catadromous Eel Resources in South East Asia, on 27-29

List of Activities	Achievements and Outcomes/Outputs of Activities
information on catadromous eels in the region	April 2016, Palembang, Indonesia. The Workshop was attended by the representatives from Malaysia, Myanmar, Philippines, Thailand, Viet Nam and Indonesia; scientists from universities; eel industries in Indonesia; the Japan International Cooperation Agency (JICA), as well as the SEAFDEC/Secretariat, AQD and IFRDMD. The Workshop discussed and then came up with following recommendations: Increase the Survival rate from glass eel to elver in the eel culture; How to measure and regulate the glass eel fishery; Origin laundering of eel seeds; Compilation of existing information/research from Member Countries.
Sub-activity 1.2: Survey on trends of catadromous eel fisheries	<p>2015: IFRDMD got information of the trends and intensity of eel capture including glass eel catch through the surveys conducted in Indonesia and Philippines.</p> <p>2016: IFRDMD got information regarding the target species and stage of anguillid eels as seeds for eel culture in Indonesia and Myanmar. In Myanmar, the target species for eel fishery and eel culture is <i>Anguilla marmorata</i> and its yellow eel has been used for seeds for culture. In Indonesia, main target species of eel fishery and eel culture is <i>A. bicolor bicolor</i> and its glass eel, elver and yellow eel are used as seeds for eel culture. Since the rearing from glass eel to elver needs high-level skills and conditions, the eel farms that can start eel farming from glass eel are still limited.</p> <p>2017: IFRDMD got information regarding the target species and stage of anguillid eels as seeds for eel culture in Viet Nam and Philippines, with technical information.</p> <p>2018: IFRDMD got information regarding the Anguillid eel fishery for seeds (glass eels and/or yellow eels) are existed in Indonesia, Philippines, Viet Nam, Myanmar, and additionally for Cambodia & Thailand.</p> <p>2019: IFRDMD gets the present status and recent trend of eel fisheries and eel resources in the region. National landing data reported to FAO global fishery and aquaculture production statistics (2019), indicates that two countries, <i>i.e.</i> Indonesia and the Philippines played a significant role in river eels fisheries landing in this region. The estimate reported landing from 1980 to 2017 showed that Indonesia increased and fluctuated since 1990, while the Philippines steadily increased since 2000 then gradually decreased after 2013.</p>
Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels	<p>2015: IFRDMD got information of the commercial distribution and trades in Indonesia and Philippines and the status of eel trades and markets in AMS through the surveys.</p> <p>2016: IFRDMD got information regarding the target species and stage of anguillid eels as seeds for eel culture in Indonesia and Myanmar. In Myanmar, there is virtually only one eel farm and they rear anguillid eel (mainly <i>A. marmorata</i>) and Rice-paddy eel. Almost all the products are exported to China, especially just before the Chinese new-year. In Indonesia, there are many eel farms in Java Is. with wide variety of their scale. Some large-scale eel farms funded by foreign company aims export of baked eel “Unagi-kabayaki” to East Asian countries. The other small and middle-scale eel farms ship their products to domestic market in Indonesia.</p> <p>2017: IFRDMD got information regarding the commodity chains and demand-supply relationships of eel seeds in Viet Nam and Philippines.</p> <p>2019: IFRDMD gets clear information regarding the amount and route of trading of eel that exist in Indonesia, Philippines, Viet Nam, Myanmar, and Thailand. Another source of export data is available globally. The general export data of river eels nei and elver live</p>

List of Activities	Achievements and Outcomes/Outputs of Activities
	showed that Indonesia (ID), Myanmar (MM) and Philippines (PH) play a significant role in the region. Export tends to decrease in 2013 for Indonesia and 2014 for Myanmar and the Philippines. The major contribution after 2010 were Myanmar and the Philippines
Activity 2 Improvement of data collection and statistics on eel fisheries	
Sub-activity 2.1: Study on catadromous eel species identification by DNA technology	2016: Many scientists have tackled species identification and species composition of anguillid eels using DNA technique. However, the results of their study have not coincided on the issue yet. We will continue preparation of the samples and materials for future analysis after the scientists in SEA who tackle with this issue would reach the agreeable method and interpretation of their analyses. 2017 & 2018: We got fundamental information regarding the species composition of anguillid eels in Viet Nam and Philippines which dominant species in AMS are <i>A. bicolor</i> and <i>A. marmorata</i> 2019: IFRDMD identified the eel samples that exist in Southeast Asia (Indonesia, Myanmar and the Philippines). There are five species ; <i>Anguilla bicolor bicolor</i> , <i>A. bicolor pacifica</i> , <i>A. marmorota</i> , <i>A. bengalensis</i> , <i>A. interioris</i> identified based the result study conducted in Indonesia (Pelabuhan ratu, Aceh, Tasik Malaya, Bengkulu and Poso). Three species, <i>A. bicolor pacifica</i> , <i>A. marmorota</i> and <i>A. luzonensis</i> , were identified based on the the result study conducted in Philippines. There was only one species, <i>A. bicolor bicolor</i> , identified in Myanmar.
Sub-activity 2.2 Study on statistical data collection methodologies	2016: Through our investigation on present status of data/information collection on eel fishery in Indonesia, we noticed that there are some official catch statistics on anguillid eels but many of them are quite fragmented and not accurate therefore unable to use these statistics into stock assessment of eel resources. We have started consultation with government officer how to improve the catch statistics on anguillid eels as soon as possible, in relation with the CITES issue. We have also started independent data collection program on anguillid eels. We have asked some eel collectors in Palabuhan Ratu and Bengkulu, Indonesia, to report daily catch and efforts on anguillid eel fishery. 2017: IFRDMD have summarized the present situation of collecting catch statistics on anguillid eels at each stage in SEAFDEC Member Countries. 2018: We have summarized the present situation of collecting catch statistics on anguillid eels at each stage in SEAFDEC Member Countries by improving the data collecting system for catch statistics (with indices of effort for monitoring of the trend and fluctuation of catch of eel seeds in the region.
Activity 3 Promotion of conservation, management and sustainable utilization	
Sub-activity 3.1: Study on elements negatively impacting catadromous eel resources and mitigating measures	We got the preliminary information regarding the relationship between upward migration of eels and the artificial constructions in the rivers in some countries. 2018: We got the preliminary information regarding the relationship between upward migration of eels and the artificial constructions in the rivers in some countries. Until now only one hydropower dam in Indonesia that already apply fish ladder which is PLTA Poso II, located in Poso river operated by PT. Poso Energy. Another precaucionary approach conducted by PT Posos Energy to maintain the sustainability of eel especially in Poso Lake is through the CSR (Corporate Social Responsibility) program, by stocking anguilla eel from lower side to upper side of the dam to increase number of eel

List of Activities	Achievements and Outcomes/Outputs of Activities
	that survebility crossing the dam. 2019: We continuously got information regarding the relationship between upward migration of eels and the artificial constructions from one hydropower dam in Indonesia that already applies fish ladder by Poso Energy Company. In 2019, this company restocked 200 kg elvers in Peura village Poso lake. On September 2019, they have plan to restock silver eels at the river mouth of Poso.
Sub-activity 3.2: Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources	2019: IFRDMD will make a leaflet/brochure on the guidelines and will share it on the workshop of five-year achievement of JTF VI by IFRDMD, Jakarta, Indonesia, October 2019. The participants come from all Member Countries, Japan and SEAFDEC.
Sub-activity 3.3: Workshop to develop policy recommendation on the sustainability of catadromous eel resources in the region	2019: IFRDMD will hold a workshop of five-year achievement of JTF VI by IFRDMD, Jakarta, Indonesia, October 2019. The participants come from all Member Countries, Japan and SEAFDEC.
Activity 4 Coordination by the project leader	
The project leader will coordinate and assist all researches and dissemination that will be supported by one assistant who hires to carry out the project effectively.	Progress meetings twice a year. The evaluation at the end of year by experts. Hiring one assistant to carry out the project effectively.

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

IFRDMD got the information of the present status on catadromous eel resources in the region and summarized the present status and problems on catch statistics and commodity chain of anguillid eel in Indonesia into scientific paper. IFRDMD got the information on the species identification of anguillid eel in AMS by morphological character and DNA analysis. IFRDMD established and improved the method of data collection on eel fisheries in the Indonesia, Myanmar, Philippines and Viet Nam, with mutual understanding of the differences and similarities on eel fisheries at each AMS, due to limited data of anguillid eel fisheries on national statistical data. It needs to find out the critical issues regarding the stock assessment to achieve the sustainable use of anguillid eel resources, before considering the several concrete management measures.

5. Publications and Others.

No.	List of completed publications in the Overall Project Duration	Type of media	Attached e-file
1.	Eel fisheries research in Member Countries	SEAFDEC Newsletter Vol. 38 No.1, Jan-March 2015.	http://www.seafdec.org/download/seafdec-newsletter-vol-42-no-1/
2.	SEAFDEC participates in Eel Symposium	SEAFDEC Newsletter VOLUME 38 NUMBER 4 October - December 2015 Page 4	http://www.seafdec.org/download/seafdec-newsletter-vol-38-no-4/
3.	IFRDMD holds discussion on establishing catch statistics on eels in Indonesia	SEAFDEC Newsletter VOLUME 39 NUMBER 4 October - December 2016 Page 12	http://www.seafdec.org/download/seafdec-newsletter-vol-39-no-4/

No.	List of completed publications in the Overall Project Duration	Type of media	Attached e-file
4.	Exchanging Information on Catadromous Eels in Southeast Asia	SEAFDEC Newsletter VOLUME 39 NUMBER 2 April - June 2016 Page 8-9	http://www.seafdec.org/download/seafdec-newsletter-vol-39-no-2/
5.	IFRDMD organizes Workshop on Enhancement of Sustainability of Catadromous Eel Resources	SEAFDEC Newsletter VOLUME 39 NUMBER 2 April - June 2016 Page 12	http://www.seafdec.org/download/seafdec-newsletter-vol-39-no-2/
6.	Current status and problems of the catch statistics on anguillid eel fishery in Indonesia (Mar. Res. Indonesia. 41(1): 1-13. in printing)	Scientific paper	http://mrijournal.or.id/index.php/MRI/issue/view/17/showToc
7.	Way forward for enhancing the sustainability of catadromous eels in Southeast Asia	Report (disclosed on official web site)	http://www.seafdec.or.id/
8.	Understanding the Current Status of Anguillid Eel Fisheries in Southeast Asia	Fish For the People Vol. 14 No.03	http://www.seafdec.org/download/fish-people-vol-14-no-3/
9.	Addressing the Issues and Concerns on Anguillid Eel Fisheries in Southeast Asia.	Fish For the People Vol. 17 No.01	http://www.seafdec.org/download/fish-for-the-people-vol-17-no-1/
10.	IFRDMD supports the Indonesian Ministry Regulation on anguillid eel resources	SEAFDEC Newsletter Vol.42 No.1 January- March 2019 Page 4	http://repository.seafdec.org/bitstream/handle/20.500.12066/4919/NL421.pdf?sequence=1&isAllowed=y
11.	IFRDMD researchers tag on Training of Trainers for Data Collection and Monitoring of Eels	SEAFDEC Newsletter Vol.42 No.1 January- March 2019 Page 6	http://repository.seafdec.org/bitstream/handle/20.500.12066/4919/NL42-1.pdf?sequence=1&isAllowed=y

PROJECT DOCUMENT**ACHIEVEMENTS FOR YEAR 2019**

			Project ID: 201505001
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia		
Program Strategy No:	I	Total Duration:	2015-2019
Lead Department:	Inland Fishery Resources Development and Management Depart (IFRDMD)	Lead Country:	Thailand
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 289,104
Project Partner:	None	Budget for 2019:	USD 45,620
Project Leader:	Dr. Dina Muthmainnah / IFRDMD	Project Participating Country(ies) :	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION**1. Brief Project Description**

This project aimed at promoting and establishing the awareness for management of inland fisheries in Southeast Asia (hereinafter it is to be called “the region”).

There are three main activities on the project. The first one aimed at reviewing activities and methodologies for promoting inland fisheries in ASEAN Member States (hereinafter referred to as “AMS”). The second one aimed at promoting effective inland fisheries management measures in AMSs. The third one aimed at studying and developing habitat conservation/resources enhancement measures suitable for the region.

2. Background and Justification

Inland fisheries are one of the important components of the economies in the region, and its contributions in rural communities are particularly important in poverty alleviation, food security and nutritional well-being. The sustainability of inland capture fisheries much depends on the quality of aquatic habitats and ecosystems.

Taking account of these issues, we should consider that fishery is not the only sector that has interest on the inland water ecosystems and there are many sub-sectors, which are often overlooked by planners and policy makers though.

We point out two important factors for better management of inland fisheries in the region, one is the improvement of data collection and another is enhancement of the governance through the application of ecosystem approach to fisheries, as well as co-management.

This program is a way to establish and strengthen the regional networking for improving the fisheries management and the conservation of fisheries resources/environment in inland waters of the region.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
<p>Objective 1:</p> <p>Reviewing the activities and the methodologies for promoting inland fisheries in AMS and finding a way forward for sustainable development of inland fisheries</p>	<p>Outcome 1:</p> <p>Understanding the present status of inland fisheries in AMS, as a basis of our consideration to find the way for sustainable development of inland fisheries in the region.</p>	<p>Output 1:</p> <p>Grasping the present status of inland fisheries in the region.</p> <p>Sharing the data, information and common understanding on inland fisheries in the region among AMS.</p> <p>Publishing a printed matter that explains the summary of the features on inland fisheries in the region at the end of this project.</p>	<p>Activity 1.</p> <p>Review of activities and methodologies for promotion of inland fisheries and find ways forward</p> <p>Gathering the data and information on present status of inland fisheries in AMS by referring to literature, web sites, interview, and field surveys.</p> <p>Holding a workshop and Forum Group Discussion (hereinafter referred to as “FGD”) for reviewing, sharing and exchanging the data and information among the fisheries experts, officers and stakeholders in AMS.</p> <p>Summarizing the various features and information on inland fisheries in AMS then publishing the results as a printed matter for distribution among AMS.</p>
<p>Objective 2:</p> <p>Seeking and promoting the effective management measures on inland fisheries in AMS</p>	<p>Outcome 2:</p> <p>Building up the skeleton of the framework for the management of inland fisheries in AMS.</p>	<p>Output 2:</p> <p>Reaching and sharing the common understanding and issues/problems on the implementation process of the co-management and right-based fisheries management on inland capture fisheries in AMS. Seeking measures/solutions for these issues by developing human resources for the people involved through the meetings. (<i>Minor revision in 2018 to add issues regarding “common understanding” and “developing human resources”</i>)</p> <p>Establishing the appropriate fisheries management measures such as size limitation, regulation on gears, open/close the fishing season, establishment of the preserves, those reflect the</p>	<p>Activity 2.</p> <p>Promotion of effective inland fisheries management measures</p> <p>Sharing, exchanging and analyzing the information on co-management and right-based fisheries management among fisheries experts, officers and stakeholders in AMS through the seminars, FGDs and field surveys. (<i>Minor revision in 2018, to change the word order to make the contents of the activity clear</i>)</p> <p>Implementing the biological studies on commercially exploited species such as growth speed, maturation, habitat and seasonal/growth-related migration, for reflecting the characteristics at each species and habitat onto the appropriate fisheries management measures.</p>

Objective	Outcomes	Outputs	Activities
		<p>biology of the targeted species at specific habitat and climatic rhythm.</p> <p>Finding the appropriate management measures and additional treatment on fisheries operation and handling the products that improve the fishers' livelihood.</p> <p>Making the map and establishing the database of habitat and inland waters resources in Southeast Asia in one format with geographic and time reference, that it can be accessed by the public.</p> <p>Finding appropriate management measures on inland fisheries in AMS that are applicable to each area and country then ask DoFs to consider the feasibility of introducing these management measures at each country. <i>(Major revision in 2017 regarding the aims and expected results of the workshop.)</i> Enhancing the capacity building on management of inland fisheries in AMS.</p>	<p>Studying the effects of several management measures on the livelihoods of fishers in inland fisheries from the perspective of socio-economic features.</p> <p>Activities to make map/data-base of inland fisheries in Southeast Asia</p> <p>Holding a workshop to share the common sense and principle on inland capture fisheries management measures and also discuss the application of the management measures onto each country, with consideration of the conditions and features of fisheries at each area. <i>(Major revision in 2017 regarding the aims and expected results of the workshop. In the original description, the aim of this workshop is to find the "practical and simple indicators" for inland fisheries management framework. However, through the 3-year study, it became clear that it is difficult to find these "indicators" in concrete through the 3-year study in this project.)</i></p> <p>Opening regional training course(s) for the researchers and officers of AMS to enhance capacity building on improving the management on inland fisheries.</p>
<p>Objective 3:</p> <p>Studying and developing habitat conservation and resource enhancement measures suitable for the region</p>	<p>Outcome 3:</p> <p>Establishing the comprehensive policies for the management of inland fisheries in the region with relationship with various</p>	<p>Output 3:</p> <p>Seeking appropriate methods/measures on the usage of inland waters for developing habitat conservation and resources enhancement measures, with capacity building for the</p>	<p>Activity 3.</p> <p>Study of habitat conservation/resources enhancement measures</p> <p>Surveying and capacity building on studying for the development of habitat conservation and for resources enhancement measures applicable to AMS. <i>(Minor revision on wording in 2018)</i></p>

Objective	Outcomes	Outputs	Activities
Holding a concluding workshop for establishing the comprehensive policies on inland fisheries management.	sectors and stakeholders.	<p>people involved in handling these issues. (<i>Minor revision on wording in 2018</i>)</p> <p>Proposal and following discussions among the scientists, officers, and the other stakeholders in AMS for establishing the comprehensive policies for the management of inland fisheries in the region.</p>	Holding a concluding workshop for establishing the comprehensive policies on inland fisheries management.

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Review of activities and methodologies for the promotion of inland fisheries and find ways forward	<ul style="list-style-type: none"> Gathering the data and information on the present status of inland fisheries in AMS by referring to the literature, web sites, interviewing and field surveys. (Sub-activity 1.1) Holding a workshop and FGD for reviewing, sharing and exchanging the data and information among the fisheries experts, officers, and stakeholders in AMS. (Sub-activity 1.2) Summarizing the various features and information on inland fisheries in AMS then publishing the results as a printed matter for distribution among AMS. (Sub-activity 1.3)
Activity 2: Promotion of effective inland fisheries management measures	<ul style="list-style-type: none"> Sharing, exchanging, and analyzing the information on co-management and right-based fisheries management among fisheries experts, governmental officers, and stakeholders in AMS through the seminars, FGDs and field surveys. Implementing the biological studies on commercially exploited species such as growth speed, maturation, habitat and seasonal/growth-related migration, for reflecting the characteristics at each species and habitat onto the appropriate fisheries management measures. Studying the effects of several management measures on the livelihoods of fishers in inland fisheries from the perspective of socio-economic features. Activities to make map/data-base of inland fisheries in Southeast Asia. (Sub-activity 2.1. <i>Revised</i>) Holding a workshop to share the common sense and principle on inland capture fisheries management measures and also discussing the application of the management measures onto each country, with consideration of the conditions and features of fisheries at each area. (Sub-activity 2.2. <i>Revised</i>) Opening regional training course(s) for the researchers and officers of AMS to enhance capacity building on improving the management on inland fisheries. (Sub-activity 2.3. <i>It was originally planned in 2018 though, it is postponed to 2019 considering the confirmation process of effectivity of the measures/guidelines that would be accepted through sub-activity 2.2 in some preliminary trials.</i>)
Activity 3: Study of habitat conservation/resources enhancement measures	<ul style="list-style-type: none"> Surveying and capacity building on studying for the development of habitat conservation and for resources enhancement measures applicable to AMS. (Sub-activity 3.1. <i>To consider the amount and the wide-range of the target fields and also to reflect the results and knowledges from the other sub-activities, this sub-activity is extended till 2019, originally planned to complete in 2018 though.</i>) Holding a concluding workshop for establishing the comprehensive policies on inland fisheries management at the end of this program. (Sub-activity 3.3)

Activity	Description
Activity 4: Coordination by the project leader	The project leader will coordinate and assist all researches and dissemination. Semi-annual meeting will be held on August to confirm the progress of respective activities and sub-activities. Project achievements will be summarized at the end of year. Annual progress report will be prepared. One assistant will be hired to carry out the project effectively.

3.3 Activity, Sub-activity and Proposed Budget for 2015-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 1: Review of activities and methodologies for the promotion of inland fisheries and find ways forward	Sub-activity 1.1: Information gathering for understanding the present status of inland fisheries in the region	5,000	25,000			
	Sub-activity 1.2: Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward	25,000 (carry forward to 2016)				
	Sub-activity 1.3: Summarizing and publishing the features on inland fishery in the region			500	1,000	8,181
Activity 2: Promotion of effective inland fisheries management measures	Sub-activity 2.1: Studying on co-management and right-based fisheries management applicable to inland fisheries in the region	35,038 (carry forward to 2016)	20,771	20,149	71,526	5,380
	Sub-activity 2.2: Holding a workshop to develop guidelines for effective inland fisheries management in the region			26,000		
	Sub-activity 2.3: Opening a regional training course for the improvement on management of inland fisheries (postponed to 2019)					10,095
Activity 3: Study of habitat conservation/resources enhancement measures	Sub-activity 3.1: Studying for development of habitat conservation/resources enhancement measures applicable to the region. (Extended till 2019)				13,500	2,200
	Sub-activity 3.2: Holding a workshop to develop the policy recommendation on responsible inland fisheries resources utilization in the region					15,202

Activity 4: Coordination by the project leader	The project leader will coordinate and assist all researches and dissemination that will be supported by one assistant who hires to carry out the project effectively.					4,562
Sub-Total Budget		65,038	45,771	46,649	86,026	45,620

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year 2019

IFRDMD has conducted five sub-activities under three main activities (Activity 1, 2 and 3) in 2019. Under these sub-activities, we conducted one workshop, one training course, field surveys in Cambodia and Lao PDR, and finishing the book draft of features on inland fisheries in Southeast Asia. IFRDMD also collected data of fish biology, fishery activity and socio-economic in Koto Panjang Reservoir Indonesia, Tonle Sap Great Lake Cambodia and Nam Xouang Reservoir Lao PDR. Through the surveys, interviews, and information gathering through literatures and internet, we grasped and shared the present situation, features, and the issues that we should take any measures on inland capture fisheries in AMSs.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Review of activities and methodologies for the promotion of inland fisheries and find ways forward					
Sub-activity 1.3 Summarizing and publishing the features on inland fishery in the region	I: Research	20 (8)	9 (3)	-	8,181
Activity 2 Promotion of effective inland fisheries management measures					
Sub-activity 2.1 Studying on co-management and right-based fisheries management applicable to inland fisheries in the region	I: Research	35 (10)	8 (5)	-	5,380
Sub-activity 2.3 Opening a regional training course for the improvement on management of inland fisheries	I: Research	10 (6)	9 (5)	-	10,095
Activity 3: Study of habitat conservation/resources enhancement measures					
Sub-activity 3.1: Studying for development of habitat conservation/resources enhancement measures applicable to the region.	I: Research	35 (10)	8 (5)	-	2,200
Sub-activity 3.2: Holding a workshop to develop the policy recommendation on responsible inland fisheries resources utilization in the region	I: Research	19 (5)	19 (10)	-	15,202
Activity 4: Coordination by the project leader					
Sub-activity 4.1: The project leader will coordinate and assist all researches and dissemination that will be supported	II: Training	3(0)	12 (4)	2	4,562

by one assistant who hires to carry out the project effectively.					
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Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Review of activities and methodologies for the promotion of inland fisheries and find ways forward		
Sub-activity 1.3 Summarizing and publishing the features on inland fishery in the region	Publishing a printed matter that explains the summary of the features on inland fisheries in the region at the end of this project.	Publish a book entitle: "The Features of Inland Fisheries in Southeast Asia", launches in October 2019.
Activity 2 Promotion of effective inland fisheries management measures		
Sub-activity 2.1 Studying on co-management and right-based fisheries management applicable to inland fisheries in the region	Reaching and sharing the common understanding and issues/problems on the implementation process of the co-management and right-based fisheries management on inland capture fisheries in AMS. Seeking measures/solutions for these issues by developing human resources for the people involved through the meetings.	IFRDMD conducts the survey in Nam Xouang Reservoir for gathering the data of fish biodiversity, fishery activity and socio economic by using the questionnaire and hires the enumerators. The one-year data was collected from June 2018 to May 2019. IFRDMD continues to collect the data of fishery activity by using the questionnaire and hired the enumerator in Koto Panjang Reservoir, Riau Province, Indonesia. The one-year data was collected from May 2018 to April 2019. IFRDMD collects the same data in Siem Reap Cambodia by using the form and questionnaire till August 2019 by hiring 3 enumerators.
Sub-activity 2.2 Holding a workshop to develop guidelines for effective inland fisheries management in the region	Enhancing the capacity building on management of inland fisheries in AMS.	Holding the Regional Training Course for the improvement on management of inland fisheries in Vientiane, Lao PDR, 25-26 July 2019. The participants come from Cambodia, Lao PDR, Myanmar, Viet Nam, Thailand and Indonesia.
Activity 3: Study of habitat conservation/resources enhancement measures		
Sub-activity 3.1: Studying for development of habitat conservation/resources enhancement measures applicable to the region.	Seeking appropriate methods/measures on the usage of inland waters for developing habitat conservation and resources enhancement measures, with capacity building for the people involved in handling these issues	Monitoring the conservation zone in Nam Xouang Reservoir, Lao PDR that established in October 2018.

Planned activity	Expected outcome/output	Achievements
Sub-activity 3.2: Holding a workshop to develop the policy recommendation on responsible inland fisheries resources utilization in the region	Proposal and following discussions among the scientists, officers, and the other stakeholders in AMS for establishing the comprehensive policies for the management of inland fisheries in the region.	Holding a workshop of five-year achievement of JTF VI by IFRDMD, Jakarta, Indonesia, October 2019. The participants come from all Member Countries, regional expert of inland fisheries, and SEAFDEC.
Activity 4: Coordination by the project leader		
Sub-activity 4.1: The project leader will coordinate and assist all researches and dissemination that will be supported by one assistant who hires to carry out the project effectively.	Project management to lead to success	Progress meetings twice a year. The evaluation at the end of year by experts. Hiring one assistant to carry out the project effectively.

4. List of Completed Publications and Others

List of completed publications for the year 2019 and others	Type of media	Attached e-file
The Features of Inland Fisheries in Southeast Asia	Book	
Inland Fisheries Management in the Southeast Asian Region: Promoting Habitat Conservation in Lao PDR and Indonesia (Special Report) by Dina Muthmainnah and Takuro Shibuno	SEAFDEC-Newsletter Vol 42, No. 1	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1 Review of activities and methodologies for the promotion of inland fisheries and find ways forward	
Sub-activity 1.3 Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward	There was no evaluation from the participants of AMS.
Activity 2 Promotion of effective inland fisheries management measures	
Sub-activity 2.1 Studying on co-management and right-based fisheries management applicable to inland fisheries in the region	There was no evaluation from the participants of AMS.
Sub-activity 2.2 Holding a workshop to develop guidelines for effective inland fisheries management in the region	Not yet conducted.
Activity 3: Study of habitat conservation/resources enhancement measures	
Sub-activity 3.1: Studying for development of	There was no evaluation from the participants of AMS.

Planned activity	Evaluation/ Views from Participants
habitat conservation/ resources enhancement measures applicable to the region.	

6. Major Impacts/Issues

It needs understanding of the wide variety of the real aspect of inland capture fisheries in the region with the capacity building of the people involved in the inland waters.

It needs to find out the critical issues regarding the fish stock to achieve the sustainable use of freshwater fish resources, before considering the several concrete management measures.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

During 5-year implemented the project, IFRDMD conducted the field surveys to investigate the present status of inland fisheries in Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam. The data of fish biology, fishery activity and socio-economic in Indonesia (Musi Banyuasin Regency, Koto Panjang Reservoir and Barito River), Tonle Sap Great Lake Cambodia and Nam Xouang Reservoir Lao PDR were collected using the questionnaires and hired the enumerators. IFRDMD initiated to set up the conservation zone signboards to promote the responsible on the utilization of inland fisheries in Nam Xouang Reservoir, Lao PDR, and three lakes (Cala Lake, Ulak Lia Lake, and Siarak Lake) in Musi Banyuasin Regency, Indonesia.

To enhance the capacity building, IFRDMD dispatched the researchers to attend the appropriate training, join the relevant meetings, and coordinate the in-house training. The dissemination of the result of researches was done by being the presenter or lecturer in the conferences. The Workshop to Review Activities and Methodologies for Promotion on Inland Fishery in 2016 was held to gather various kind of valuable information and made the summarization. IFRDMD started to grasp the information not only from the surveys or interview but also through kinds of literature and internet that the information gathering was to publish in the semi-popular publication at the end of the project.

The Regional Training Course for the improvement on the management of inland fisheries was held in Vientiane, Lao PDR that the participants came from Cambodia, Lao PDR, Myanmar, Viet Nam, Thailand, and Indonesia. At the end of project duration, IFRDMD organized the Workshop on 5-year of IFRDMD's Achievement for reviewing the result of the department and getting the improvement of inland fisheries study from AMSs.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1 Review of activities and methodologies for the promotion of inland fisheries and find ways forward	
Sub-activity 1.1: Information gathering for understanding the present status of inland fisheries in the region	Information gathering by referring to the literature, web sites, interviewing and field surveys on the present status of inland fisheries in AMS
Sub-activity 1.2: Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward	Reviewing, sharing and exchanging the data and information among the fisheries experts, officers, and stakeholders in AMS by holding a workshop and FGD

List of Activities	Description of Implemented Activities
Sub-activity 1.3: Summarizing and publishing the features on inland fishery in the region	Summarizing the various features and information on inland fisheries in AMS by publishing the semi-popular publication.
Activity 2 Promotion of effective inland fisheries management measures	
Sub-activity 2.1: Studying on co-management and right-based fisheries management applicable to inland fisheries in the region	<p>Sharing, exchanging, and analyzing the information on co-management and right-based fisheries management among fisheries experts, governmental officers, and stakeholders in AMS through the seminars, FGDs and field surveys.</p> <p>Implementing the biological studies on commercially exploited species such as growth speed, maturation, habitat and seasonal/growth, for reflecting the characteristics at each species and habitat onto the appropriate fisheries management measures.</p> <p>Studying the effects of several management measures on the livelihoods of fishers in inland fisheries from the perspective of socio-economic features.</p> <p>Activities to make data-base of inland fisheries in Southeast Asia.</p>
Sub-activity 2.2: Holding a workshop to develop guidelines for effective inland fisheries management in the region	Organizing a workshop to share the common sense and principle on inland capture fisheries management measures and also discussing the application of the management measures onto each country, with consideration of the conditions and features of fisheries at each area.
Sub-activity 2.3: Opening a regional training course for the improvement on management of inland fisheries <i>(postponed to 2019)</i>	Holding the Regional Training Course for the improvement on management of inland fisheries in Vientiane, for the researchers and officers of AMS to enhance capacity building.
Activity 3 Study of habitat conservation/resources enhancement measures	
Sub-activity 3.1: Studying for development of habitat conservation/resources enhancement measures applicable to the region. <i>(Extended till 2019)</i>	<p>Conducting the field survey on studying for the development of habitat conservation and resources enhancement measures applicable to AMS.</p> <p>Enhancing the capacity building by conducting the collaboration survey with others department.</p>
Sub-activity 3.2: Holding a workshop to develop the policy recommendation on responsible inland fisheries resources utilization in the region	Holding the Workshop on 5-year of IFRDMD's Achievement as the concluding workshop for establishing the comprehensive policies on inland fisheries management at the end of this program.
Activity 4 Coordination by the project leader	
The project leader will coordinate and assist all researches and dissemination that will be supported by one assistant who hires to carry out the project effectively.	Progress meetings twice a year. The evaluation at the end of year by experts. Hiring one assistant to carry out the project effectively.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
<p>Activity 1 Review of activities and methodologies for the promotion of inland fisheries and find ways forward</p>	
<p>Sub-activity 1.1: Information gathering for understanding the present status of inland fisheries in the region</p>	<p>2015: As a part of our research activities on information gathering, the data of the types of fishing gears and the condition of fisheries in Central Kalimantan had been recorded.</p> <p>2016: In the workshop on Fishway Design, the need to know how to make the fish pass model and how to regulate water during low water level were discussed.</p> <p>2017: The present status and various kind of information regarding inland fisheries and surrounding issues in Lao PDR and Cambodia are grasped through the field surveys. There are different types of inland waters and variety of management measures are applied at each condition. Inland fisheries in Lao PDR are conducted in various inland waters such as rivers, swamps, rice-paddies and so on. However, the collecting catch information and surveys are mainly conducted limitedly in reservoirs. In Cambodia, fishers have various fisheries activities and they change/adapt their fishing methods, places, and related activities with the season especially related the water levels.</p> <p>On daily activities, we collected the publication on inland fisheries especially in Southeast Asia, to improve the information.</p>
<p>Sub-activity 1.2: Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward</p>	<p>2016: IFRDMD held a workshop on 8-10 August in Palembang, Indonesia, with participants from 8 DoFs of AMS and 9 scientists/specialists on inland fisheries in this region.</p> <p>The reports and presentation contained valuable information on inland fisheries and surrounding condition/background. IFRDMD is now summarizing and analyzing the information for extracting the important issues to reflect it to our project, especially for Sub-activity 2.1 and 2.2 in 2017.</p>
<p>Sub-activity 1.3: Summarizing and publishing the features on inland fishery in the region</p>	<p>2018: IFRDMD picked up some major components and features on inland capture fisheries in AMS by referring the literature, web sites (also including the results of the questionnaire and the workshop those had been conducted in 2016) with the cross-checking each other. Then we summarized these features and present status at each SEAFDEC member country into the table, to reveal the similarities and differences among the countries.</p> <p>After we finish completion of the summary table, we ask each SEAFDEC member country to confirm, any corrections and filling out the blanks remaining in the table by the end of 2017. The completed summary table express the basic data on the features of inland capture fisheries in the region and effective for consideration and planning our future activities.</p> <p>2019: Publish a book entitle: "The Features of Inland Fisheries in Southeast Asia", launches in October 2019.</p>

List of Activities	Achievements and Outcomes/Outputs of Activities
<p>Activity 2 Promotion of effective inland fisheries management measures</p>	
<p>Sub-activity 2.1: Studying on co-management and right-based fisheries management applicable to inland fisheries in the region</p>	<p>2016: IFRDMD conducted information gathering and field surveys in Lao PDR, Cambodia including the interviewing with MRC. In Lao PDR, fisheries committees have been established at each reservoir. They regulate their fisheries operations, dispute coordination and financial issues on fishermen's communities. However, the roles of the fisheries committees are still limited on basic issues and it seemed that it would be difficult to manage the fisheries resources by themselves (in one large-scale reservoir, fishers did not find effective measures against the decline of their target species).</p> <p>Inland fisheries in Cambodia are varying their styles, activities and efforts, depending on the seasonal variation of water level. One of the other characteristics of inland fisheries in Cambodia is the relationship/conflicts with other sectors on usage of inland waters.</p> <p>Dialogues among Lower Mekong Basin countries have been conducted on mitigating transboundary impacts from water management projects, fishing activities and exotic species.</p> <p>We also conducted in-house training on co-management of inland fisheries in Indonesia with inviting Prof. Endi from RIFEC, Gov. Indonesia as lecturer.</p> <p>2017: IFRDMD has conducted field surveys in Philippine, Thailand, Malaysia and Viet Nam for information gathering. Philippines has introduced the enumerator system for gathering the catch statistics at the landing places frequently. This system enabled us to gather reliable and monitor the situation of fisheries resources and their level of exploitation.</p> <p>Thailand also has data collection system on catch statistics by setting enumerators in the markets. They also conduct experimental operation for studying the fish biology in the wild stock.</p> <p>Re-stocking activities are also conducted in Thailand to enhance the production by Culture Based Fisheries in the reservoirs. In general, freshwater aquaculture is focused more than the capture fishery in Thailand.</p> <p>In Malaysia, we learn for Tagal system that it has success to revitalize rare fish resources and increase the income from livelihood of people around the tagal area.</p> <p>The opportunity of inland fisheries in Viet Nam is establishment of fish sanctuaries to protect valuable genetic resources.</p> <p>We also conducted In-House Training on the Features of Inland Fisheries in ASEAN region, and In-House on co-management and right based fisheries by inviting the lecturer from University and research institute, Indonesia, to deepen the understanding of the present status and issues in Inland fisheries in the region.</p>

List of Activities	Achievements and Outcomes/Outputs of Activities
<p>Sub-activity 2.2: Holding a workshop to develop guidelines for effective inland fisheries management in the region</p>	<p>2018: IFRDMD in collaboration with the Research Institute for Inland Fishery and Extension (RIIFE), Ministry of Marine Affairs and Fisheries of Indonesia held a “Workshop on Quantitative Estimation of Freshwater Fish Stock” on 21-22 November 2018 in Palembang, Indonesia. The objectives of the Workshop were: 1) to understand the methods on quantitative estimation of freshwater fish stock; 2) to identify appropriate methods for freshwater fish stock assessment; and 3) to discuss the strategic framework to implement simultaneously the appropriate fish stock assessment methods among ASEAN Member States (AMSs). The Workshop was attended by representatives from seven AMSs (Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, and Thailand), chairman and members of the National Committee of Fish Stock Assessment for Indonesia, researchers from various institutes, and scientists from universities. <i>Prof. Ian G. Cowx</i>, Director of the Hull International Fisheries Institute, University Hull, UK; <i>Prof. Dr. Indra Jaya</i> from Bogor Agriculture University; <i>Mr. Vanna Nuon</i> from the Mekong River Commission; and <i>Dr. Arif Wibowo</i>, IFRDMD Chief and Director of RIIFE, served as resource persons. Moreover, each country delegate presented the report on estimated freshwater fish stock in their respective countries.</p>
<p>Sub-activity 2.3: Opening a regional training course for the improvement on management of inland fisheries (postponed to 2019)</p>	<p>2019: Holding the Regional Training Course for the improvement on management of inland fisheries in Vientiane, Lao PDR, 25-26 July 2019. The participants come from Cambodia, Lao PDR, Myanmar, Viet Nam, Thailand and Indonesia. This workshop aimed to review the collection of valuable information on inland fisheries, particularly on catch statistics, fishing gears, fisheries management measures and fishers’ livelihoods by each member Country. The researchers and officers of AMS enhanced their capacity building on improving the management on inland fisheries.</p>
<p>Activity 3 Study of habitat conservation/resources enhancement measures</p>	
<p>Sub-activity 3.1: Studying for development of habitat conservation/resources enhancement measures applicable to the region. (Extended till 2019)</p>	<p>2018: Surveying and capacity building on studying for the development of habitat conservation and for resources enhancement measures applicable to AMS.</p> <p>IFRDMD, led by SEAFDEC/Training Department, conducted the collaboration surveys in Nam Xouang Reservoir, Lao PDR in determining and monitoring the conservation zone.</p> <p>IFRDMD initiated to set up the signboards to promote the responsible on utilization of inland fisheries in Nam Xouang Reservoir, Lao PDR and three lakes (Cala Lake, Ulak Lia Lake and Siarak Lake) in Musi Banyuasin Regency, South Sumatra Province, Indonesia.</p>
<p>Sub-activity 3.2: Holding a workshop to develop the policy recommendation on responsible inland fisheries resources utilization in the region</p>	<p>2019: IFRDMD will hold the Workshop on 5-year of IFRDMD’s Achievement on 8-10 October 2019 in Jakarta, Indonesia.</p>
<p>Activity 4 Coordination by the project leader</p>	
<p>The project leader will coordinate and assist all researches and dissemination, which will be supported by one</p>	<p>2019: Progress meetings twice a year. The evaluation at the end of year by experts. Hiring one assistant to carry out the project effectively.</p>

List of Activities	Achievements and Outcomes/Outputs of Activities
assistant who hires to carry out the project effectively.	

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Need to gather information more on inland fisheries at each area/country to understand the real situation and also to seek the key issues. It should be treated to achieve the sustainable use of freshwater fish resources before considering the several concrete management measures.

Need to understand the wide variety of the real aspect of inland capture fisheries in the region with the capacity building of the people involved in the inland waters.

Need to find out the critical issues regarding the fish stock to achieve the sustainable use of freshwater fish resources, before considering the several concrete management measures.

Revisiting including mapping the historical research activities and its findings should be carried out through desk study. This information could be treated as a baseline to strengthen and to fill the gap between achieving science-based local riverine healthy index and improvement conceptual fisheries management plan.

Prioritizing on-site location for data collection should be arranged under the scheme of protecting inland waters ecosystem through reasonable annual work plan on research funds and its outcome.

One way to promote the responsible utilization of inland fisheries is set up the signboard containing the information on the importance and benefits of practicing conservation areas to the residents. This regulation does not allow private, and the group of the people uses any fishing gears and other animals-aquatic in this whole zone.

5. Publications and Others

List of completed publications	Type of media	Attached e-file
IFRDMD started off preliminary survey on utilization of inland fisheries	SEAFDEC Newsletter Vol. 38 No.2, Apr-Jun 2015.	
IFRDMD organizes In-house Training on Co-management in Inland Fisheries	SEAFDEC Newsletter Vol. 39 No. 1, January-March 2016,	
IFRDMD held the In-House Training on Features of Inland Fisheries in Southeast Asia	SEAFDEC Newsletter Vol.40 No.2, April-June 2017	
Special Report: Gathering Catch Statistics and Related Data on Inland Fisheries (Dina Muthmainnah, Ni Komang Suryati, Sevi Sawestri, Satoshi Honda)	SEAFDEC Newsletter Vol.40 No.3, July-September 2017	
IFRDMD conducts in-house training on fisheries and modeling	SEAFDEC Newsletter Vol.40 No.3, July-September 2017	
IFRDMD conducts research in Mekong River and the Red River	SEAFDEC Newsletter Vol.41 No.1, January-March 2018	
IFRDMD staff participate in the MRC training	SEAFDEC Newsletter Vol.41 No.1, January-March 2018	
IFRDMD holds workshop on estimating freshwater fish stock	SEAFDEC Newsletter Vol.41 No.4, October-December 2018	
IFRDMD installs fishing regulation signboards in Lao PDR and Indonesia	SEAFDEC Newsletter Vol.41 No.4, October-December 2018	
Inland Fisheries Management in the Southeast Asian Region: Promoting Habitat Conservation in Lao PDR and Indonesia (by Dina Muthmainnah and Takuro Shibuno)	SEAFDEC Newsletter Vol.42 No.1, January-March 2019	
Highlighting the Importance of Inland Capture Fisheries in the Southeast Asian Region (Dina Muthmainnah, Safran Makmur, Sevi Sawestri, Aroef	Fish for the People: Volume 15 Number 3: 2017	

List of completed publications	Type of media	Attached e-file
Hukmanan Rais, Siswanta Kaban, Freddy Supriyadi, Khairul Fatah, and Satoshi Honda)		
Presentation File: Situation of Inland Fisheries in Indonesia and Other Southeast Asian Countries (Dina Muthmainnah)	Workshop of Gifu Pref. Inland Fisheries Training Center Opening Ceremony Gifu, Japan, 24 July 2016	
Presentation File: The Effectivity of Inland Fisheries Management Toward Sustainable Utilization (Dina Muthmainnah)	International Class: Aquatic Resource Management, Palembang, Indonesia, 13 February 2019	
Presentation File: Presentation File: The implementation of inland fisheries management in Southeast Asia to keep the sustainability fisheries.	International Class: Inland Fisheries Research towards Sustainable Utilization, Palembang, Indonesia, 9 September 2019.	

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

Project ID: 201301005			
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Promotion of Countermeasures to Reduce IUU Fishing Activities		
Program Strategy No.:	I	Total Duration:	2014 - 2019
Lead Department:	Training Department (TD)	Lead Country:	Malaysia
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 291,505
Project Partner:	None	Budget for 2019:	USD 90,000
Project leader:	Kongpathai Saraphaivanich / TD	Project Participating Country(ies):	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

All countries in the Southeast Asian region, the efforts are now focusing on the promotion of sustainable fisheries management through appropriate development/implementation of countermeasures against IUU fishing. The recognition on the importance of fishing management schemes such as fishing gear license, fishing vessels registration, etc. as effective measures to promote sustainable use and the long-term conservation of marine living resources has been increasing in the region. Following the direction of Resolution and Plan of Action, the SEAFDEC Training Department (TD) has been implementing the project titled “Promotion of Countermeasures to Reduce IUU Fishing” to enhance collaboration of SEAFDEC Member Countries (MCs) in reducing IUU fishing in the region. This project consists of three main activities, namely: 1) Promotion and development of the Regional Fishing Vessels Record (RFVR); 2) Strengthening of Port State Measures and other surveillance measures in the region; and 3) Promotion of information materials.

2. Background and Justification

Illegal, Unreported and Unregulated (IUU) fishing can take place in all capture fisheries. Efforts to conserve and manage fish stocks are undermined by IUU fishing, which can lead to the collapse of fisheries or can seriously impair efforts to rebuild fish stocks that have already been depleted. This may result in the loss of both short- and long-term social and economic opportunities and could have negative impacts on food security.

The Plan of Action on Sustainable Fisheries for Food Security Towards 2020 adopted in ASEAN-SEAFDEC Conference Fish for the People 2020 “Adaptation to a Changing Environment” in Bangkok, Thailand during 13-17 June 2011 emphasizes on: 1) strengthening regional and national policy and legislation to implement measures and activities to combat IUU fishing, including the development and implementation of national plans of action to combat IUU fishing, and promoting the awareness and understanding of international and regional instruments and agreements through information dissemination campaigns, 2) establishing and strengthening regional and sub-regional coordination on fisheries management and efforts to combat IUU fishing including the development of regional/sub-regional Monitoring, Control and Surveillance (MCS) networks, 3) facilitating consultative dialogue among fisheries legal officers to share, at the sub-regional/regional level, perspectives of the respective legal and regulatory framework in terms of developing MCS-networks and to take action to combat IUU fishing, and 4) building up capacity among MCs, including functions for regional and sub-regional cooperation, to effectively meet the requirements of port state measures and flag state responsibilities.

Following the direction of Resolution and Plan of Action, the SEAFDEC/TD has been implementing the project titled “Promotion of Countermeasures to reduce IUU Fishing” in coordination and cooperation with MCs to reduce IUU fishing activities in the region.

This project was originally planned to be implemented from 2013 to 2017. However, in the SEAFDEC activities in the project since 2013, including the RFVR and Port State Measures (PSM), it has become clearer that an extension of the project period will provide more benefits to MCs in terms of combating IUU, including the updates of RFVR Database and strengthening capacity building on PSM implementation. Moreover, these activities were raised up in the high level meetings such as SEAFDEC Council, FCG-ASSP, SOM and ASEAN fisheries-related meeting, where it was agreed that these activities are effective tools to reduce IUU fishing. Thus, it has been proposed in this project document to extend the period by 2 years, until 2019.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: Improving Counter measures to reduce IUU fishing	Outcome 1: Coordination, cooperation and application of countermeasure to reduce IUU fishing activities by MCs	Output 1: Regional Fishing Vessel Record database in the region	Activity 1: Promotion and development of the regional fishing vessels record (RFVR)
Objective 2: Strengthening awareness building and common understanding on counter measures to reduce IUU fishing		Output 2: Countries awareness building and common understanding of Port State Measure activities as a tool to reduce IUU fishing	Activity 2: Strengthening of Port State Measures and other surveillance measures in the region Activity 3: Production of information materials

3.2 Overall Scope/Description of Project

Activity	Description
1) Promotion of Regional Fishing Vessels Record (RFVR)	<p>Sub-activity 1.1: Development and management of RFVR Database</p> <p>Follow up the approval of the RFVR activities by the SEAFDEC Council at its 45th Meeting in 2013. The database of regional vessels record of 24 meters in length and over has been designed, developed and updated in collaboration with MCs. The database will be used as tool to combat IUU fishing in the region.</p> <p>Sub-activity 1.2: Technical workshop on RFVR database development and management</p> <p>The technical workshop will be organized. The selected/nominated persons are involved in/and responsible for this activity. The selected MCs will be invited to participate in the workshop. TD staff operating the database will visit each country to discuss and consult for developing and managing the database of RFVR of 24 meters in length and over.</p> <p>Sub-activity 1.3: Technical assistant on using of RFVR database</p> <p>The technical assistance on using of RFVR database and existing mechanism in MCs will be conducted. It will support and strengthen the system of fishing license and vessel registration in MCs to reduce IUU fishing.</p>

Activity	Description
2) Strengthening Port State Measures and other surveillance measures in the region	<p>Sub-activity 2.1: Providing technical assistant on PSM facilities and existing mechanism in MCs</p> <p>The technical assistance on PSM facilities and existing mechanism in MCs will be conducted. The output information will be used to prepare and organize on-site training and workshop on strengthening PSM and other surveillance measures to reduce IUU fishing in collaboration with MCs.</p> <p>Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian region</p> <p>Under the activity, regional consultations in the implementation of PSM will be organized in collaboration with the SEAFDEC Secretariat.</p>
3) Production of information materials	Production on information and promotional materials such as VDO, poster, report, etc. related to the countermeasures to IUU fishing activities will be carried out during the implementation of the project activities and disseminated to MCs and worldwide.

3.3 Activity, Sub-activity and Proposed Budget for 2014-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2014	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
Activity 1: Promotion of Regional Fishing Vessels Record (RFVR)	Sub-activity 1.1: Development and management of RFVR Database					12,908	
	Sub-activity 1.2: Technical workshop on RFVR database development and management	17,000	31,280		21,000		
	Sub-activity 1.3: Technical assistant on using of RFVR Database		3,520	10,000	10,000	4,000	
Activity 2: Strengthening Port State Measures and other surveillance measures in the region	Sub-activity 2.1: Providing technical assistant on PSM facilities and existing mechanism in SEAFDEC Member Countries	9,000			21,000	20,643	30,760
	Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region	10,400		18,400	20,000	2,000	
Activity 3 Production of information materials		500	1,000	1,000	1,000	1,094	
	Sub-Total	36,900	35,800	29,400	73,000	40,645	30,760

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Update of the RFVR Database on 24 meters in length and over in collaboration with MCs.

The Meeting on RFVR in Southeast Asia was organized from 13 to 14 May 2019 as side event meeting in “the Fifth Meeting of the Global Record Informal Open-Ended Technical and Advisory Workshop Group (GRWG5)” with support of the Food and Agriculture Organization of the United Nations (FAO) and the Government of the Republic of Korea at the JW Marriott Hotel Seoul, Seoul, the Republic of Korea. The Meeting discussed on the progress of updated information for RFVR Database 24 meters in length and over, preparation and way forward on the development of the RFVR Database less than 24 meters in Southeast Asia, future cooperation with FAO on sharing information between RFVR and Global Record.

The Meeting resulted with the planned activities for the following year (2020) and the way to cooperation with FAO in the future.

The Regional Training on Port State Measures (PSM) implementation for Inspectors in Southeast Asia was organized in collaboration with partners, such as the Department of Fisheries (DOF) Thailand, Australian Fisheries Management Authority (AFMA), FAO, National Oceanic and Atmospheric Administration (NOAA), and the United States Agency for International Development (USAID) from 22 to 26 July 2019 at SEAFDEC/TD, Samut Prakan, Thailand. The training focused on updating the current situation on inspection activities for port control and PSM from AMSs through sharing information on the implementation of PSM inspection from our partners. The training also provided a study trip to observe the PSM inspection as port activities for tuna carrier vessel. At the end, the participants were expected to better understand in the implementation of PSM, and increasing of knowledge, skills and experience on inspection to support PSM and port control implementation.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Promotion of Regional Fishing Vessels Record (RFVR)					
Sub-activity 1.2 Technical workshop on RFVR database development and management	Policy	14 (2)	3	3 (2)	2,476
Activity 2 Strengthening of Port State Measures and other surveillance measures in the region					
Sub-activity 2.1: Providing technical assistant on PSM facilities and existing mechanism in SEAFDEC Member Countries	Training	24 (5)	5 (3)	11 (5)	12,992

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Promotion of Regional Fishing Vessels Record (RFVR)		
Sub-Activity 1.1: Monitoring and updating of RFVR database 24 meters in length and over	RFVR database in the region	Updating of information on the RFVR Database
Sub-activity 1.2 Technical workshop on RFVR database development and management	RFVR database in the region	The progress of updated information for RFVR Database 24 meters in length and over, preparation and way forward on the development of the RFVR Database less than 24 meters in Southeast Asia, future cooperation with FAO on sharing information between RFVR and Global Record. The Meeting resulted with planned activities for the following year (2020) and the way to cooperation with FAO in the future
Activity 2 Strengthening Port State Measures and other surveillance measures in the region		

Planned activity	Expected outcome/output	Achievements
Sub-activity 2.1: Providing technical assistant on PSM facilities and existing mechanism in SEAFDEC Member Countries	Awareness building of countermeasures as a tool to reduce IUU fishing in the region	Regional cooperation on the support and capacity building in the implementation of PSM in the region

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
Technical VDO for relevant on the subject in “The Regional Training on Port State Measures (PSM) implementation for Inspectors in Southeast Asia”	VDO	https://www.youtube.com/c/SEAFDEC%20TrainingDepartment

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 2 Strengthening of Port State Measures and other surveillance measures in the region	
Sub-activity 2.1: Providing technical assistant on PSM facilities and existing mechanism in SEAFDEC Member Countries	Most of participants well gained confidence in the following topics in the training. They can better understand on the implementation of PSM, and increasing of knowledge, skills and experience on inspection to support Port State Measures and port control implementation.

6. Major Impacts/Issues

- Updating the information on the RFVR Database has been done annually based on information submitted from the MCs to TD to develop the RFVR database in real-time and as user-friendly database. However, due to some internal issues, some MCs have not yet submitted the update data to TD.
- Since a lack of field expertise and experience on vessel inspection on PSM at SEAFDEC, a closer cooperation with other organizations, such as, DOF Thailand, NOAA, FAO, etc., has been continued in the implementation of PSM.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

According to the implementation plan of the project activities, the overall achievements were made as follows:

- Development and updating information on RFVR Database 24 meters in length and over in collaboration with MCs as a tool to reduce IUU fishing in the region. Five technical workshops and meetings were organized to discuss and share on the situation and development in 2014, 2015, 2017, 2018 and 2019 respectively. The RFVR National Focal Points (NFPs) and Representatives from MCs were invited to participate in the workshops and meeting. The workshops resulted with the implementation of strategies and way forward of activities.
- A series of meeting and workshop on “Regional cooperation to support implementation on PSM” were conducted in cooperation with our partners, such as FAO, USAID, etc. The outputs resulted with the further understanding on the implications to the region of the entry-into-force of the Port State Measures Agreement, including identified institutional responsibilities among MCs, recommendations on the need of regional cooperation.

- The capacity building for MCs through the training course on supporting the implementation of PSM was conducted for Fishery Managers and Inspectors for their further understanding to implement PSM activities. The training was cooperated with SEAFDEC/TD partners, such as, NOAA, USAID, DOF (Thailand), Australian Fisheries Management Authority and FAO.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activity	Description of Implemented Activities
1) Promotion of Regional Fishing Vessels Record (RFVR)	
Sub-activity 1.1: Development and management of RFVR Database	Following up the approval of the Regional Fishing Vessels Record (RFVR) activity by the SEAFDEC Council at its 45 th Meeting in 2013, the database of RFVR of 24 meters in length and over was designed and developed. Updating the information on RFVR database was conducted in collaboration with MCs. The database is used as tool to combat IUU fishing in the region.
Sub-activity 1.2: Technical workshop on RFVR database development and management	The technical workshops and meetings were organized to discuss and share on the situation and development the RFVR database. The RFVR National Focal Points (NFPs) from MCs were invited to participate in the workshop.
Sub-activity 1.3: Technical assistant on using of RFVR Database	The technical assistance in using the RFVR database and existing mechanism in MCs was conducted. The RFVR database supports and strengthens the system of fishing license and vessel registration in MCs to reduce IUU fishing.
2) Strengthening of Port State Measures and other surveillance measures in the region	
Sub-activity 2.1: Providing technical assistant on PSMs facilities and existing mechanism in SEAFDEC Member Countries	The technical assistance for PSM facilities and existing mechanism in MCs was provided. The information were used to prepare and organize a training/workshop on strengthening PSMs and other surveillance measures to reduce IUU fishing in collaboration with MCs.
Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region	Under the activity, regional consultations to discuss the implementation of PSM in the region were organized.
3) Production of information materials	Information and promotional materials (<i>e.g.</i> VDO, poster, report, etc.) related to the countermeasures to IUU fisheries activities were produced in the implementation of the project activities and disseminated to MCs and worldwide.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
1) Promotion of Regional Fishing Vessels Record (RFVR)	
Sub-activity 1.1: Development and management of RFVR Database	The database of RFVR 24 meters in length and over was designed and developed. Updating the information on RFVR database was conducted twice a year in collaboration with MCs. The database was used as tool to combat IUU fishing in the region. Moreover, the initiative on the development of RFVR less than 24 meters was also discussed and prepared as next activity.
Sub-activity 1.2: Technical workshop on RFVR database development and management	Five technical workshops and meetings were organized to discuss and share on the situation and development in 2014, 2015, 2017, 2018 and 2019, respectively. The RFVR National Focal Points (NFPs) and Representatives from MCs were invited to participate in the workshop and meeting. The workshop resulted with the implementation strategies and way forward of activity implementation.

List of Activities	Achievements and Outcomes/Outputs of Activities
Sub-activity 1.3: Technical assistant on using of RFVR Database	The technical assistance in using RFVR database and existing mechanism in Myanmar was conducted. Further, the technical assistance in the development of RFVR database to support and strengthen the system of fishing license and vessel registration in Cambodia was conducted as per the country's request.
2) Strengthening of Port State Measures and other surveillance measures in the region	
Sub-activity 2.1: Providing technical assistant on PSMs facilities and existing mechanism in SEAFDEC Member Countries	The technical assistance for PSM facilities and existing mechanism in MCs through the capacity building to support the implementation of PSM was conducted through the "Training Course on Supporting the Implementation of PSM for Fisheries Managers in 2018" and "Training Course on Supporting the Implementation of PSM for Inspectors in 2019". The both training courses were coordinated with others international agencies, such as FAO, NOAA, USAID, DOF (Thailand), Australian Fisheries Management Authority as SEAFDEC partners.
Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region	Two expert meeting and workshop was organized. "The Expert Meeting on Regional Cooperation to support the Implementation of Port State measures in Southeast Asian Region was held on 2-4 February 2016". This meeting resulted with a concept proposal on regional cooperation to support the implementation of PSM, which would be addressed at the Council and a high-level conference under the ASEAN mechanism through the updated regional issues and challenges in the implementation of PSM. "The Workshop on Regional Cooperation for Implementation of Port State Measures to Improve Fisheries Management and Reduce IUU Fishing in Southeast Asia" was organized on 7-10 November 2019. This workshop resulted with 1) further understanding on the implications to the region of the entry-into-force of the PSM Agreement, with identifying institutional responsibilities among MCs, 2) a set of "Recommendations on Regional Cooperation on PSM" with additional references to artisanal fisheries, etc., 3) basic points defined to guide the need to strike a balance, including clear institutional responsibilities, in the application and use of flag state measures, coastal state measures, port state measures and other measures, 4) the updated Work Plan on steps ahead to facilitate implementation of the PSM Agreement - including efforts to foster coordination and cooperation between institutions and across boundaries, and 5) capacity-building needs indicated together with information on key institutions and personnel groups of priority for training.
3) Production of information materials	Information and promotional materials such as VDO on the inspection on PSM were produced. Reports of a series of meetings and workshop were produced and disseminated to MCs and worldwide.

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

The Project had good coordination and support from MCs on the development and updated information on RFVR Database 24 meters in length and over. However, due to an internal issue in some MCs, they have not yet submitted the updated data to SEAFDEC/TD. The Project will continue to cooperate with these MCs. In parallel, the information of fishing vessels and carrier vessels less than 24 meters in length are also requested by RFVR National Focal Points as a tool to support combating IUU fishing.

The capacity building to support the implementation of PSM in the region is still required and requested by MCs. The training course on supporting the implementation of PSM for MCs was conducted in collaboration with the SEAFDEC partners, such as the Department of Fisheries Thailand, FAO, USAID, NOAA, Australian Fisheries Management Authority, etc. Further, the regional cooperation to support the implementation of PSM should be strengthened and continued.

5. Publications and Others

RFVR report

- The Report of the Technical Workshop on Regional Fishing Vessel Record (RFVR) Database Development and Management in Southeast Asia (2014)
<http://repository.seafdec.or.th/handle/20.500.12067/409>
- Regional Technical Consultation on the Regional Fishing Vessels Record: Use and Way Forward of RVFR Database as a Management Tool to Reduce IUU Fishing in Southeast Asian Region (2015)
<http://repository.seafdec.or.th/handle/20.500.12067/410>
- Report of the Regional Technical consultation on Evaluation of Implementation and Utilization of the RFVR 24 meters in length and over to Reduce IUU Fishing in Asian (2017)
<http://repository.seafdec.or.th/handle/20.500.12067/455>
- Report of the Regional Meeting on the Regional Fishing Vessel Record (RFVR) for 24 meters in length and over as a Management Tool toward Combating IUU Fishing in ASEAN (2018)
<http://repository.seafdec.or.th/handle/20.500.12067/875>

PSM Report

- Report of the Experts Meeting on Regional Cooperation to Support the Implementation of Port State Measures in Southeast Asian Region (February 2016)
<http://repository.seafdec.or.th/handle/20.500.12067/411>
- Report of the Workshop on Regional Cooperation for Implementation of Port State Measures to Improve Fisheries Management and Reduce IUU Fishing in Southeast Asia (November 2019)
<http://repository.seafdec.or.th/handle/20.500.12067/454>

Article in Fish for the People

- Development of Regional Fishing Vessels Record as Tool to Combat IUU Fishing in Southeast in Southeast Asia (Volume 10 Number 3:2012) <http://repository.seafdec.org/handle/20.500.12066/900>
- Regional Fishing Vessels Record: Option to Mitigate IUU Fishing in Southeast Asia (Volume 12 Number 1: 2014) <http://repository.seafdec.org/handle/20.500.12066/935>
- Regional Fishing Vessels Record: A Management Tool for Combating IUU Fishing in Southeast Asia (Volume 14 Number 2: 2016) <http://repository.seafdec.org/handle/20.500.12066/990>
- Highlighting SDG 14 in the Development and Management of Southeast Asian Marine Capture Fisheries (Volume 15 Number 1:2017) <http://repository.seafdec.org/handle/20.500.12066/1009>
- Supporting Southeast Asian Countries in Implementing Port State Measures (Volume 14 Number 2:2016) <http://repository.seafdec.org/handle/20.500.12066/989>
- Strengthening Regional Cooperation to Support the Implementation of Port State Measures in Southeast Asia (Volume 15 Number 3:2017) <http://repository.seafdec.org/handle/20.500.12066/1289>

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2019
AND
PROPOSED ACTIVITY FOR YEAR 2020**

Project id: 201601009			
Program Categories:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand		
Program Strategy No. :	I	Total Duration:	2016-2020
Lead Department:	TD	Lead Country:	Philippines
Donor/Sponsor:	Global Environment Facility	Total Donor Budget: (Co-finance Budget)	USD 3,000,000 (USD 13,717,850)
Project Partner:	United Nations Environment	Budget for 2020:	USD 800,430.00
Project Director:	Somboon Siriraksophon (since July 2018)	Involved Country:	Cambodia, Indonesia, Malaysia, Philippines, Thailand and Viet Nam

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

The longer-term goals of this project are to contribute to:

- Improved integration of habitat and biodiversity conservation considerations in the management of fisheries in the South China Sea and Gulf of Thailand;
- Improved national management of the threats to fish stock and critical habitat linkages within fisheries *refugia*; and,
- Enhanced uptake of good practice in integrating fisheries management and biodiversity conservation in the design and implementation of regional and national fisheries management systems.

The medium-term objectives align with those of the fisheries component of the Strategic Action Programme for South China Sea which are to:

- Build the resilience of Southeast Asian fisheries to the effects of high and increasing levels of fishing effort;
- Improve the understanding among stakeholders, including fisherfolk, scientists, policy-makers, and fisheries managers, of ecosystem and fishery linkages as a basis for integrated fisheries and ecosystem/habitat management; and
- Build the capacity of fisheries departments/ministries to engage in meaningful dialogue with the environment sector regarding the improvement of fisheries and management of interactions between fisheries and critical marine habitats.

This specific project objective is ‘*to operate and expand the network of fisheries refugia in the South China Sea and Gulf of Thailand for the improved management of fisheries and critical marine habitats linkages in order to achieve the medium and longer-term goals of the fisheries component of the Strategic Action Programme for the South China Sea*’, including:

- By 2020, to have established a regional system of a minimum of fourteen *refugia* for the management of priority transboundary, fish stocks and endangered species; and
- By 2020, to have prepared and implemented fisheries management systems in the identified priority *refugia* based on and consistent with, the ASEAN SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia.

2. Background and Justification

The South China Sea is a global center of shallow water marine biological diversity that supports significant fisheries that are important to the food security and export income of Southeast Asian countries. These fisheries are characterized by high levels of fishing effort from the small-scale sector. Accordingly, all inshore waters of the South China Sea basin are subject to intense fishing pressure. This situation of high small-scale fishing pressure and declining fisheries resources has contributed to the adoption of unsustainable fishing methods to maintain catch and increase incomes in the short-term. Although action aimed at reducing the rate of loss of coastal habitats has been implemented by countries bordering the South China Sea, the decadal rate of loss of such habitats remains high, e.g. seagrass beds (30 percent), mangroves (16 percent), and coral reefs (16 percent). This continued decline in the total area of habitats critical to the life cycles of most aquatic species, combined with the high levels of coastal community dependence on fish, has raised serious concerns for the long-term sustainability of small-scale fisheries in the region. With fish production being intrinsically linked to the quality and area of habitats and the heightened dependence of coastal communities on fish, a need exists to improve the integration of fish habitat considerations and fisheries management in the region. This project entitled “Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand” has been developed to meet this need via implementation of the fisheries component of the Strategic Action Program for the South China Sea. Key anticipated results included: establishment of operational management at 14 priority fisheries *refugia*; strengthened enabling environments for the formal designation and operational management of *refugia*; enhanced national uptake of best practices in integrating fisheries management and biodiversity conservation; and strengthened cross-sectorial coordination for integrated fisheries and environmental management. The project aligns with the inter-governmentally approved guidelines for the establishment of fisheries *refugia* that constitute part of the ASEAN SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia as well as recent regional policy guidance promoting the development of projects and initiatives aimed at ensuring more ecosystem-based approaches to fisheries management in the Southeast Asia region.

3. Gender Sensitivity of the Project

Yes, even though the adopted project document is not mentioned on gender-sensitivity, but the project implementation includes the importance of mainstreaming - policy and activities with regard to gender equality. Ratio of female/male participations in all national and regional activities/meetings and levels and specific occupations are recorded from Year 1 to the end of project for analyzing the impact of project plan. Training capacity in the field of gender, and gender sensitivity of training materials from the partners are used and applied for management of fisheries *refugia* in participating countries.

4. Project Overall Objectives/Targets, Outcomes, Outputs, Indicators and Activities

4.1 Targets, Outcome, Output and main Activity of the Project

Objective/Targets	Outcomes	Expected Outputs	Main Activity
Effective management of key threats to 14 fisheries <i>refugia</i> sites [269,500 ha], including ~50 percent reduction in fishing pressure within sites at times critical to the life-cycles of fished species of transboundary significance	Reduced stress on fish stocks and coastal habitats via improved national management of key anthropogenic threats to fisheries and critical habitat linkages in the South China Sea and Gulf of Thailand	14 fisheries <i>refugia</i> profile reports, including GIS maps & site characterisations, published 14 published management plans and 24 annual reports Quarterly reports [224] of network meetings and activities [including list of participants and results of work] 4 annual partnership reports	Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand
National and regional policy, legal and planning frameworks for demarcating boundaries and managing fisheries	Increased institutional capacity in the 6 participating countries for the designation and	<ul style="list-style-type: none"> 6 published national reviews and recommendations for reforms of national, provincial and municipal regulations/ordinances for responsible fishing practices 	Improving the management of critical habitats for fish stocks of transboundary significance via

Objective/Targets	Outcomes	Expected Outputs	Main Activity
<p><i>refugia</i>, resulting in, inter alia, a 20 percent increase in small-scale fishing vessels using fishing gear and practices designed to safeguard fish stock and critical habitat linkages at priority sites</p>	<p>operational management of fisheries <i>refugia</i> via the transformation of enabling environments and the generation of knowledge for planning</p>	<p>at priority <i>refugia</i></p> <ul style="list-style-type: none"> • 6 endorsed revised policies • 6 published national guidelines on establishing and operating fisheries <i>refugia</i> • 6 national reports on policy, legal and institutional aspects of <i>refugia</i> establishment and management published • Endorsed policy and executive orders, provincial/local ordinances and by-laws • 6 endorsed National Action Plan for the management of priority fisheries <i>refugia</i> and associated biodiversity • 1 endorsed Regional Action Plan for fisheries <i>refugia</i> • 96 quarterly and 24 annual reports on fish stocks and habitats published online • 6 databases online and populated with datasets • 6 national and 1 regional Geographical Information System online and populated with site-based information • Characterisations for 14 <i>refugia</i> sites accessible online • 1 modelling system online • 4 published reports of the results of demonstrations 	<p>national and regional actions to strengthen the enabling environment and knowledge-base for fisheries <i>refugia</i> management in the South China Sea and Gulf of Thailand</p>
<p>National and regional systems for knowledge management and sharing, including the development of indicator sets and standardized statistics to guide the replication, scaling-up and mainstreaming of good practices in the use of fisheries <i>refugia</i> as a spatial planning tool</p>	<p>Strengthened knowledge management and information sharing and access for enhanced uptake of good practice in integrating fisheries management and biodiversity conservation in the design and implementation of fisheries and environmental management systems, including Marine Spatial Planning</p>	<ul style="list-style-type: none"> • 146 online national and 1 regional catalogue of best practice approaches and measures • 24 communications on best practices published and syndicated • 24 awareness materials published online • Annual reports of outreach programmes at 14 priority locations, including tracking of extent of community acceptance [56 reports] • 6 online national web portals on fisheries <i>refugia</i> • 6 published GEF IW experience notes (one per country and one regional) on application of fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand 	<p>Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea and Gulf of Thailand</p>

Objective/Targets	Outcomes	Expected Outputs	Main Activity
		<ul style="list-style-type: none"> Information and education materials accessible at SEAFDEC and online 1 endorsed regional report published online 	
Effective multi-lateral and intergovernmental communication and joint decision-making, including the use of a consensual knowledge-base in planning ecologically and cost-effective management actions	Cost-effective and efficient coordination of national and regional level cooperation for integrated fisheries and environmental management	<ul style="list-style-type: none"> 6 NFRC Terms of Reference and 48 biannual meeting reports (joint management decisions and participant lists) 6 NSTC Terms of Reference and 96 quarterly meeting reports (scientific and technical advice and participants lists) 14 Management Board Terms of Reference and 224 quarterly meeting reports (joint management decisions and participant lists) RSTC Terms of Reference and 4 annual meeting reports (documenting scientific and technical advice and participant lists) PSC Terms of Reference and 4 annual meeting reports (documenting joint decisions and participant lists) Terms of Reference and contracts for project coordination unit staff 	National and regional cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea and Gulf of Thailand

4.2 Overall Scope/Description of Project

Activity/COMPONENT	Description
Activity 1 Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea	Includes: Developing fisheries and coastal habitat information and data collection programs for 14 priority fisheries <i>refugia</i> sites; Facilitating agreement among stakeholders on the boundaries of fisheries <i>refugia</i> at 14 priority fisheries <i>refugia</i> sites; Developing Community-Based Management Plans for sites; Establishing operational management for 14 priority fisheries <i>refugia</i> sites; and Strengthening civil society and community organization participation in the management of 14 fisheries <i>refugia</i> sites.
Activity 2 Improving the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-base for fisheries <i>refugia</i> management in the South China Sea	Includes: Enhancing policy guidance for improved management of the effects of fishing on critical habitats in the 6 participating countries; Defining the policy and legal basis for formal designation and establishment of fisheries <i>refugia</i> in the 6 participating countries; Development of national guidelines on the establishment and operation of fisheries <i>refugia</i> and reflected in an updated regional <i>refugia</i> action plan; Reforming national and regional policy, legal and planning frameworks for demarcating boundaries and managing <i>refugia</i> ; Enhancing access to information relating to status and trends in fish stocks and their habitats in waters of the SCS marine basin; Improving national and regional-level management and sharing of information and

Activity/COMPONENT	Description
	data on fish early life history in the waters of the SCS; Enhancing access to information relating to the locations and status of coastal habitats and management areas in the SCS; Strengthening the information base for the planning, monitoring and evaluation of management at 14 priority fisheries <i>refugia</i> sites; Improving basin-wide understanding of linkages between ocean circulation patterns, nutrient/chlorophyll concentrations, and sources and sinks of fish larvae in the South China Sea; and Generation of regionally and locally appropriate best practices generated to address the effects of trawl and push net fishing on seagrass habitat, and the capture of juveniles, pre-recruits and fish in spawning condition.
Activity 3 Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea	Includes: Enhancing uptake of best practices in integrating fisheries management and biodiversity conservation in the 6 participating countries; Improving community acceptance of area based approaches to marine management in the 6 participating countries; Capture and sharing of knowledge generated and experiences from establishing and operating fisheries <i>refugia</i> ; Developing information and education campaigns for small-scale fisherfolk on the links between fisheries, habitats and biodiversity coordinated regionally through a Regional Education and Awareness Centre; and Development of standardized methods for collection and analysis of information and data for use in assessing impacts of <i>refugia</i> and design appropriate indicators for the longer-term operation of the regional system of fisheries <i>refugia</i> .
Activity 4 National cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea	Includes: Strengthening cross-sectorial coordination in the establishment and operation of fisheries <i>refugia</i> in the participating countries; Harnessing national scientific and technical expertise and knowledge to inform policy, legal and institutional reforms for fisheries <i>refugia</i> ; Catalyzing local community action via establishment and operation of site-based management boards at 14 priority <i>refugia</i> sites; Coordination of regional and national-level activities and reporting requirements of UNEP and GEF; and Regional cooperation in the establishment and operation of a regional system of fisheries <i>refugia</i> .

4.3 Activity and Proposed Budget for 2017-2020

(Unit: USD)

Activity/COMPONENTS		Y1 2016	Y2 2017	Y3 2018	Y4 2019	Y5 2020
1	Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea		80,000	174,100	294,800	214,700
2	Improving the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-based for fisheries <i>refugia</i> management in the South China Sea		29,120	299,000	247,000	161,000
3	Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea		20,000	88,400	100,900	67,630
4	National cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea	95,650	160,000	312,500	298,100	357,100
Total Budget		95,650	289,120	874,000	940,800	800,430
Grand Total Budget		USD 3,000,000.00				

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for 2019 (JAN.-SEP. 2019)

Project Management

Activity/Component 1

- Initiation of fisheries and coastal habitat information and data collection programs for 15 priority fisheries *refugia* sites
- Intensive series of consultation on the boundaries of fisheries *refugia* which have been supported by facilitated processes to identify key threats to fisheries *refugia* sites and to initiate discussion about possible management measures for evaluation
- Governance reviews, stakeholder analyses, socio-economic information and data collation, and reviews of existing management arrangements are in progress by 12/15 Sites;
- Letters of Agreement signed with all participating countries: Viet Nam and Indonesia signed the LOA and started implementation of the Fisheries *Refugia* since May and June 2019 respectively.
- National teams trained in project management and governance arrangements

Activity/Component 2

- Working document for regional level review on key threats from fishing and the environment to fish stock and critical habitat linkages at the priority sites in the participating countries
- existing regulations and by-laws in the areas of the 12/15 sites at which the project is presently working have been compiled and reviewed, with feedback provided to national teams, to aid in the formulation of recommendations on policy and legal reforms to support promotion of responsible fishing at times and at locations critical to fish stock and critical habitat linkages
- Workshops with local stakeholders and officials on policy and legal aspects of *refugia* (terminology, procedures, recommended reforms) in the participating countries have allowed discussions to be viewed through a more realistic lens which reflects local stakeholder needs, expectations, and concerns about socio-economic impacts of management
- Questionnaire survey templates have been prepared to: (a) compile and update information and data on the distribution of habitats; known spawning areas; locations of *refugia*; MPAs; fisheries management areas; and critical habitats for endangered species; and (b) produce detailed site characterizations for the 15 priority fisheries *refugia* sites for incorporation into national and regional datasets. Preparation of detailed Terms of Reference for the development and application of a modelling system linking oceanographic, biochemical, and fish early life history information to improve regional understanding of fish early life history and links to critical habitats have been prepared and discussed with regional universities, and Internationally recognized institutions with expertise in this field
- The Minister of Ministry of Agriculture, Forestry, and Fisheries (MAFF) endorsed the Proclamation of The Establishment of Management Area of Mackerel Fisheries *Refugia* in Koh Kong, and the Blue Swimming Crab Fisheries *Refugia* in Kep, Cambodia in 2019;

Activity/Component 3

- The fisheries-*refugia.org* regional web site has been developed and populated with newly developed short films, journal articles written by regional project staff during the reporting period and is supported by various social media platforms including YouTube and Facebook. A six-part short film social media campaign has been prepared and will be implemented.
- The national fisheries-*refugia* web portals in local language have been developing by countries.
- The Regional Meeting for identification the indicators for management of the Fisheries *Refugia* after the end-project was organized in September 2019. Accordingly, the standardized methods for collection and analysis of information and data on *refugia* effectiveness (including indicator system) was also discussed to be included into one regional paper to guide Country in establishment and management of fisheries *refugia* for long term sustainability.
- Back to back with the RM on Indicators, the SEAFDEC/PCU in collaboration with SEAFDEC Sweden Project conducted the Regional Consultative Meeting on Management of Transboundary Species: Short Mackerel. The result is the Final Draft of the Regional Action Plan for Management of Short Mackerel (Indo-pacific Mackerel) in the Gulf of Thailand Sub-Region where the results is extent to the South China Sea sub-region. This RAP-Short Mackerel will be further addressed at the PCM, SEAFDEC Council, FCG/ASSP and high-level of SOM for further endorsement and supported.

Activity/Component 4

- 15 sites have progressed agreement on detailed terms of reference for site-based management boards
- The 2nd Meeting of Regional Scientific and Technical Committee (RSTC2) was organized in May 2019 with aim to create the regional cooperation in the integration of scientific knowledge and research outputs with management, while the RSTC2 discussed on management of transboundary species and other management tools to support the establishment of fisheries *refugia* by countries. Additionally, the progress works at national and regional have been updated.
- The 2nd Meeting of Regional Project Steering Committee (PSC1) was also organized on 5-6 November 2019, hosted by the Department of Fisheries Malaysia. The results from the PSC2 are updated national and regional program for consideration and endorsement by the committee *e.g.* the draft Indicators for management of fisheries *refugia*, Draft Regional Plan of Action for Sustainable Management of Short Mackerel, Ocean Modelling, regional workplan on best practices of fisheries gears and methods. The meeting also noted on the knowledge attitude and practices to be applied during the implementation.

2. Information of Present Year Activity including Involved Stakeholders (JAN.-SEP. 2019)

List of Actual Activity By 4 Components	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity COM-1	R, T, I	594+500	10		79,721.35
Activity COM-2	P, R				38,970.23
Activity COM-3	P, I				30,888.56
Activity COM-4	P, I, R	60	10	15	170,455.73
Total Expenditures in 2019 as of 30 September					320,035.87
Remaining Budget till 31 December 2019					~620,765

3. Outcome/Outputs of the past Activity (JAN.-SEP. 2019)

Planned activity	Expected outcome/output	Achievements/Outcome and Outputs
COMPONENT 1	Fisheries <i>refugia</i> profile reports, including GIS maps and site characterisations, published for 14 priority sites	<p>Letters of Agreement signed by all 6 relevant Country:</p> <p>15 priority <i>refugia</i> sites are selected by 6 countries: 3 sites each in Cambodia, Philippines and Viet Nam; and 2 sites each in Indonesia Malaysia, and Thailand.</p> <p>A package of data and information of fisheries and coastal habitat including identified key threats to fisheries <i>refugia</i> sites.</p> <p>Draft demarcation area (GIS Map) for establishment of Short Mackerel fisheries <i>refugia</i> in Trat Province, Thailand</p> <p>Draft demarcation area (GIS Map) for establishment of Blue Swimming Crab fisheries <i>refugia</i> in Surat Thani Province, Thailand</p> <p>17 Quarterly reports network meetings and activities [including list of participants and results of work]</p>
COMPONENT 2	Published national reviews & recommendations for reforms of national, provincial and municipal	<p>2 Endorsed policy and executive orders, provincial/local ordinances and by-laws including national action plan for management of priority <i>refugia</i> as follows:</p> <p>Endorsed Proclamation of the Establishment of Management Area of Mackerel Fisheries <i>Refugia</i> in Koh</p>

Planned activity	Expected outcome/output	Achievements/Outcome and Outputs
	regulations/ordinances for responsible fishing practices at priority <i>refugia</i> ; and Characterisations for 14 <i>refugia</i> sites accessible online	Kong province, Cambodia Endorsed Proclamation of the Establishment of Management Area of Blue Swimming Crab Fisheries <i>Refugia</i> in Kep province, Cambodia 1 draft regional action plan for fisheries <i>refugia</i> of transboundary species; short mackerel; 1 modelling system using the system developed by partners is online;
COMPONENT 3	Awareness materials published online, and online national web portals on fisheries <i>refugia</i>	1 Regional fisheries <i>refugia</i> website is online; 6 national web portals linked to the regional with page are online. Information and education materials accessible at SEAFDEC and online; 1 draft regional report on “Standardized Methods for Collection and Analysis of Data and Information for the use in Assessing the Impacts of Fisheries <i>Refugia</i> and in the Designing of Appropriate Indicators for Long Term Management of the Regional System of Fisheries <i>Refugia</i> ” published online 1 article of the progress report in 2019 is published online under the GEF/IW LEARN website;
COMPONENT 4	NFRC Terms of Reference and biannual meeting reports (joint management decisions and participant lists); and NTSC Terms of Reference and quarterly meeting reports (scientific and technical advice and participants lists)	15 sites have been progressed agreement on detailed terms of reference for site-based management boards; 13 Quarterly reports of the site-based management boards are online; 1 Report of the 2 nd Meeting of the Regional Scientific and Technical Committee is published online; 1 Report of the 2 nd Meeting of the Project Steering Committee is published online;

4. List of Completed Publications and Others

	List of completed publications as of 30 September 2019	Type of media	Attached e-file
	CAMBODIA REPORT		
1	Field visit in Preah Sihanouk, Kep provinces and Koh Kong province.	E-doc.	CAM-REP2017Q1_001☒
2	Field visit in Koh Kong province.	E-doc.	CAM-REP2017Q3_002☒
3	Management Board Meeting of Marine Fisheries Management Area (MFMA) Technical Working Group	E-doc.	CAM-REP2017Q3_003☒

	List of completed publications as of 30 September 2019	Type of media	Attached e-file
4	Stakeholder Consultation Workshop for Relevant Provincial Departments and NGOs, Community Fisheries at Kep Province	E-doc.	CAM-REP2017Q3_004☒
5	Consultation Meeting for 3 stakeholder consultations on Identified Fish Species for Fisheries <i>Refugias</i> at Preah Sihanouk province	E-doc.	CAM-REP2017Q3_005☒
6	Stakeholder Consultation Workshop for Relevant Departments at Preah Sihanouk Province	E-doc.	CAM-REP2017Q3_006☒
7	Stakeholder Consultation Workshop for Deum Tkov Community Fisheries at Preah Sihanouk Province	E-doc.	CAM-REP2017Q3_007☒
8	Stakeholder Consultation Workshop for Koh Rong Saloem Community Fisheries at Preah Sihanouk Province	E-doc.	CAM-REP2017Q3_008☒
9	Stakeholder Consultation Workshop for Relevant Departments, Peam Krasob Community Fisheries, and Koh Kapi Community Fisheries at Koh Kong Province	E-doc.	CAM-REP2017Q3_009☒
10	Consultation Meeting with Relevant Stakeholders to Select the Site for Marine Fisheries Management Area Including Fisheries <i>Refugia</i> in Kampot Province	E-doc.	CAM-REP2018Q3_012☒
11	Consultation Meeting with Community Fisheries and Kampot Fisheries Administration Cantonment to Draw A Map of Marine Fisheries Management Area Including Fisheries <i>Refugia</i> in Kampot Province	E-doc.	CAM-REP2018Q3_013☒
12	Consultation Meeting with Koh Kong Fisheries Administration Cantonment and Community Fisheries to Draw The Map of Indo-Pacific Mackerel Fisheries <i>Refugia</i> in Koh Kong Province	E-doc.	CAM-REP2018Q3_014☒
13	Stakeholder Consultation Workshop of Marine Fisheries Management Area Management Plan Preparation in Kep Province	E-doc.	CAM-REP2018Q3_015☒
14	Stakeholder Consultation Workshop for Fisheries <i>Refugia</i> With Community Fisheries	E-doc.	CAM-REP2018Q4_016☒
15	Stakeholder Consultation Workshop for Fisheries <i>Refugia</i> with Provincial Line Departments	E-doc.	CAM-REP2018Q4_017☒
16	The 1st Technical Working Group Meeting on Marine Fisheries Management Area Management Plan Preparation in Kep Province	E-doc.	CAM-REP2018Q4_018☒
17	Stakeholder Consultant Meeting on The Creation of Mackerel Fisheries <i>Refugia</i> in Koh Kong, Monitoring Landing Site and Market, and Relevant Data Collection	E-doc.	CAM-REP2018Q4_019☒
18	Monitoring Mackerel Gonad growth and Sea Bottom in fisheries <i>Refugia</i> in Prem Krasob and Koh Kapi, Koh Kong Province.	E-doc.	CAM-REP2017Q4_020☒
19	Stakeholder Consultation Workshop on The Proclamation of The Creation and Management of Mackerel Fisheries <i>Refugia</i> in Koh Kong and the Creation of Management Task Force of Marine Fisheries Management Area in Koh Kong	E-doc.	CAM-REP2018Q4_021☒
20	The Baseline Survey of Short Mackerel in Koh Kong province.	E-doc.	CAM-REP2017Q1_022☒
21	Consultation Meeting to Prepare Action Plan for the Implementation of Mackerel Fisheries <i>Refugia</i>	E-doc.	CAM-REP2019Q1_023☒
22	Reviewing the Map Boundary of The Plan for Marine Fisheries Management Area and Discussion with Community Fisheries on Management Measurement of Grouper's Fingerling Collection in Kampot Province	E-doc.	CAM-REP2019Q1_024☒
23	Reviewing 3 Years Management Plan for Marine Fisheries Management Area in Kep	E-doc.	CAM-REP2019Q1_025☒

	List of completed publications as of 30 September 2019	Type of media	Attached e-file
24	Technical Training Program on Biological Studies of Short Mackerel in Koh Kong	E-doc.	CAM-REP2019Q1_026 ☒
25	Meeting on Preparation for Dissemination Action Plan and Training on The Importance of Mackerel Fisheries <i>Refugia</i> in Koh Kong	E-doc.	CAM-REP2019Q1_027 ☒
26	Consultation Meeting on Zoning of Plan for Marine Fisheries Management Area in Kampot	E-doc.	CAM-REP2019Q1_028 ☒
27	The Baseline Survey of Short Mackerel and Sampling Fish Larvae Collection in Koh Kong Province.	E-doc.	CAM-REP2019Q_029 ☒
29	UTM Point Collection at Chhorng Horn Community Fisheries Site in Kampot Province.	E-doc.	CAM-REP2019Q1_030 ☒
30	Dissemination on The Importance of Mackerel Fisheries <i>Refugia</i> in Koh Kong	E-doc.	CAM-REP2019Q1_031 ☒
31	Dissemination on The Proclamation of Marine Fisheries Management Area in Koh Po and Koh Tonsay in Kep Province	E-doc.	CAM-REP2019Q1_032 ☒
32	Meeting with Private Sector on Zoning and Diving at Nataya Resort in Kampot	E-doc.	CAM-REP2019Q1_033 ☒
33	Diving at Chhrong Horn Community Fisheries and Nataya Resort in Kampot Province.	E-doc.	CAM-REP2019Q1_034 ☒
34	Data Analysis of Sampling Fish Larvae Collection in March in Koh Kong Province	E-doc.	CAM-REP2019Q1_035 ☒
35	The Baseline Survey of Short Mackerel and Sampling Fish Larvae collection of April in Koh Kong Province	E-doc.	CAM-REP2019Q2_036 ☒
36	2 nd Technical Working Group Meeting on Reviewing 5 Years Management Plan for Marine Management Area and Blue Swimming Crab Fisheries <i>Refugia</i> in Kep Province.	E-doc.	CAM-REP2019Q2_037 ☒
37	The Baseline Survey of Short Mackerel and Sampling Fish Larvae Collection of May in Koh Kong Province.	E-doc.	CAM-REP2019Q2_038 ☒
38	Stakeholder Consultation Meeting Report at Provincial Level on Establishment and Draft Proclamation of Marine Fisheries Management Area and Fisheries <i>Refugia</i> Site in Kampot	E-doc.	CAM-REP2019Q2_039 ☒
39	Meeting on Management Action Preparation for Marine Fisheries Management Area and Blue Swimming Crab Fisheries <i>Refugia</i> in Kep	E-doc.	CAM-REP2019Q2_040 ☒
40	Validation Meeting to Finalize the 5 Years Management Plan for Marine Fisheries Management Area and Blue Swimming Crab Fisheries <i>Refugia</i> in Kep	E-doc.	CAM-REP2019Q2_041 ☒
41	The Baseline Survey of Short Mackerel and Sampling Fish Larvae Collection in Koh Kong Province	E-doc.	CAM-REP2019Q2_042 ☒
42	Stakeholder Consultation Meeting Report at National Level on Draft Proclamation of The Establishment of Management Area of Mackerel Fisheries <i>Refugia</i> in Koh Kong	E-doc.	CAM-REP2019Q2_043 ☒
43	Data Analysis of Sampling Fish Larvae Collection In Koh Kong in April and May 2019	E-doc.	CAM-REP2019Q2_045 ☒
44	The Baseline Survey of Short Mackerel and Sampling Fish Larvae Collection in Koh Kong Province	E-doc.	CAM-REP2019Q3_046 ☒
45	Consultation Meeting and Follow Up Installation of Mooring Buoys at the Boundary of Blue Swimming Crab Fisheries <i>Refugia</i> in Koh Po, Kep Province	E-doc.	CAM-REP2019Q3_047 ☒
46	National Consultative Meeting on Final Draft Proclamation of The Establishment of Management Area of Mackerel Fisheries <i>Refugia</i> in Prem Krasob, Koh Kong at Ministry of Agriculture Forestry and Fisheries.	E-doc.	CAM-REP2019Q3_048 ☒

	List of completed publications as of 30 September 2019	Type of media	Attached e-file
47	National Consultative Meeting on Reviewing 5 Years Action Plan (2019-2023) For Marine Fisheries Management Area and Blue Swimming Crab Fisheries <i>Refugia</i> in Koh Po and Koh Tonsay Archipelago, Kep Province at Fisheries Administration.	E-doc.	CAM-REP2019Q3_049 ☒
48	The Baseline Survey of Short Mackerel and Sampling Fish Larvae Collection in Koh Kong Province.	E-doc.	CAM-REP2019Q3_050 ☒
49	Data Analysis of Sampling Fish Larvae Collection in Koh Kong From June to August 2019	E-doc.	CAM-REP2019Q3_051 ☒
50	The Baseline Survey of Short Mackerel and Sampling Fish Larvae Collection in Koh Kong Province.	E-doc.	CAM-REP2019Q3_052 ☒
51	Technical Working Group at Kep Provincial Hall Administration to Discuss on Arrangement of Provincial Management Committee Meeting to Approve 5 Years Action plan for Marine Fisheries Management Area and Blue Swimming Crab Fisheries <i>Refugia</i> , <i>Kep Province</i> .	E-doc.	CAM-REP2019Q3_053 ☒
52	Data Analysis of Fish Larvae of Scombridae Family by Month From March to September 2019 in Koh Kong Province.	E-doc.	CAM-REP2019Q3_054 ☒
	PHILIPPINES REPORT		
1	Site-Level Inception Workshop	E-doc.	PH-REP2017Q1_001
2	Site-Level Inception Workshop	E-doc.	PH-REP2017Q1_002
3	Site-Level Inception Workshop	E-doc.	PH-REP2017Q1_003
4	Site Level Inception Workshop and Baseline Data Collection	E-doc.	PH-REP2017Q2_004
5	Coron <i>Refugia</i> Site Management Committee Meeting	E-doc.	PH-REP2017Q2_005
6	Coron Stakeholders Consultation Workshop	E-doc.	PH-REP2017Q2_006
7	Bolinao Fisheries <i>Refugia</i> Site Management Committee Meeting	E-doc.	PH-REP2017Q3_007
8	Initial Ichthyoplankton Survey in Selected Areas of Masinloc Bay	E-doc.	PH-REP2017Q3_008
9	Monitoring And Data Validation on Fisheries Data Collection In Coron, Palawan	E-doc.	PH-REP2017Q3_009
10	Initial Ichthyoplankton Survey in Selected Areas of Bolinao Bay	E-doc.	PH-REP2017Q3_010
11	Fisheries Data Collection on Fish Landing Sites in Coron Site and Masinloc Site.	E-doc.	PH-REP2017Q3_011
12	Fisheries Data Collection on Fish Landing Sites in Coron Site and Masinloc Site	E-doc.	PH-REP2017Q3_012
13	Endorsement of Newly Hired Enumerator to the Lgu Bolinao and Visit to Sampling Sites	E-doc.	PH-REP2018Q1_013
14	Quarterly Monitoring and Data Validation of Data Collection in Masinloc, Zambales	E-doc.	PH-REP2018Q1_014
15	Fisheries Data Collection on Fish Landing Sites in Coron Site, Masinloc Site & Bolinao Site	E-doc.	PH-REP2018Q1_015
16	Quarterly Monitoring and Data Validation of Data Collection in Bolinao Pangasinan	E-doc.	PH-REP2018Q2_016
17	Quarterly Monitoring and Data Validation of Data Collection in Coron, Palawan	E-doc.	PH-REP2018Q2_017
18	Ichthyoplankton Survey in Selected Areas of Coron Bay	E-doc.	PH-REP2018Q2_018
19	Fisheries Data Collection on Fish Landing Sites in Coron Site, Masinloc Site & Bolinao Site	E-doc.	PH-REP2018Q2_019
20	Quarterly Monitoring and Data Validation of Data Collection in Bolinao, Pangasinan	E-doc.	PH-REP2018Q2_020
21	Fisheries <i>Refugia</i> Project Meeting with Pcu	E-doc.	PH-REP2018Q2_021
22	Quarterly Monitoring and Data Validation of Data Collection in Masinloc, Zambales	E-doc.	PH-REP2018Q2_022

	List of completed publications as of 30 September 2019	Type of media	Attached e-file
23	Coordination with Lgu for the Stakeholders Consultation Workshop and Ocular Visit to Possible Workshop Venue	E-doc.	PH-REP2018Q2_023
24	Fisheries Data Collection on Fish Landing Sites in Coron Site, Masinloc Site & Bolinao Site	E-doc.	PH-REP2018Q3_024
25	Ichthyoplankton Survey in Selected Areas of Masinloc	E-doc.	PH-REP2018Q3_025
26	Fisheries <i>Refugia</i> Stakeholders Consultation Workshop - Bolinao Site	E-doc.	PH-REP2018Q3_026
27	Fisheries <i>Refugia</i> Stakeholders Consultation Workshop - Masinloc Site	E-doc.	PH-REP2018Q4_027
28	Fisheries <i>Refugia</i> Stakeholders Consultation Workshop - Coron Site	E-doc.	PH-REP2018Q4_028
29	Fisheries Data Collection on Fish Landing Sites in Coron Site, Masinloc Site & Bolinao Site	E-doc.	PH-REP2018Q4_029
30	Initial Ichthyoplankton Survey in Selected Areas of Bolinao Bay	E-doc.	PH-REP2018Q4_030
	THAILAND REPORT		
1	Stakeholder Meeting of Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand.	E-doc.	TH-REP2017Q3_001
2	Stakeholder Meeting of Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea And Gulf of Thailand.	E-doc.	TH-REP2017Q3_002
3	Stakeholder Meeting of Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand.	E-doc.	TH-REP2017Q3_003
4	Stakeholder Meeting of Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand.	E-doc.	TH-REP2017Q3_004
5	Stakeholder Consultation Workshop of Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand.	E-doc.	TH-REP2018Q1_005
6	Stakeholder Consultation Workshop of Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand.	E-doc.	TH-REP2018Q2_006
7	The First Meetings of Thailand National Fisheries <i>Refugia</i> Committee and Thailand National Scientific and Technical Committee	E-doc.	TH-REP2018Q3_007
8	Consultation Meeting of the Project Implementation	E-doc.	TH-REP2018Q4_008
9	The Second Meeting of Thailand National Fisheries <i>Refugia</i> Committee	E-doc.	TH-REP2018Q4_009
10	Consultation Meeting of the Project Implementation	E-doc.	TH-REP2018Q4_010
11	The First Meeting of Thailand National Scientific and Technical Committee	E-doc.	TH-REP2018Q4_011
12	The Third Meeting of Thailand National Fisheries <i>Refugia</i> Committee	E-doc.	TH-REP2019Q1_012
13	Consultation Meeting for the Arrangement of Site-Based Fisheries <i>Refugia</i> Management Board in Surat Thani Province	E-doc.	TH-REP2019Q1_013
14	Consultation Meeting for the Arrangement of Site-Based Fisheries <i>Refugia</i> Management Board in Trat Province	E-doc.	TH-REP2019Q1_014
15	Consultation Meeting for the Arrangement of Baseline Data Collection	E-doc.	TH-REP2019Q1_015
16	Consultation Meeting on the Preparation for Financial Audit	E-doc.	TH-REP2019Q1_016
17	The Fourth Meeting of Thailand National Fisheries <i>Refugia</i> Committee	E-doc.	TH-REP2019Q1_017
18	The First Meeting of Site-Based Fisheries <i>Refugia</i> Management Board in Trat Province	E-doc.	TH-REP2019Q2_018

	List of completed publications as of 30 September 2019	Type of media	Attached e-file
19	The First Meeting of Site-Based Fisheries <i>Refugia</i> Management Board in Surat Thani Province	E-doc.	TH-REP2019Q2_019
20	The Fifth Meeting of Thailand National Fisheries <i>Refugia</i> Committee	E-doc.	TH-REP2019Q2_020
	INDONESIA REPORT (STARTING FROM Q3/2019)		
1	Report on the First National Coordination Meeting	E-doc.	ID-REP2019Q3_001
2	Report on Coordination Meeting “Technical Guidance for Project Activities Implementation”	E-doc.	ID-REP2019Q3_002
3	Inception Meeting: Preparation for Implementation of Fisheries <i>Refugia</i> Project	E-doc.	ID-REP2019Q3_003
	SEAFDEC PCU		
1	The South China Sea Fisheries <i>Refugia</i> Initiative and the Sustainable Development Goals	E-doc. article	FR_SP2017_001
2	The SEAFDEC/UNEP/GEF South China Sea Fisheries <i>Refugia</i> Initiative	E-doc. article	FR_SP2018_002
3	The article on project Facebook page entitled “SCS LEARN : The South China Sea Fisheries <i>Refugia</i> Initiative and the Sustainable Development Goals	E-doc. article	FR_SP2018_003
4	The article on project Facebook page entitled “SCS LEARN : An Overview of the South China Sea Fisheries <i>Refugia</i> Initiative”	E-doc. article	FR_SP2019_004
5	SHORT FILM entitled “The South China Sea Fisheries <i>Refugia</i> Initiative ”on project Facebook page and YouTube	Film	FR_Film_001
6	Short film entitled “Implementing the Strategic Action Programme for the South China Sea” on project Facebook page and YouTube	Film	FR_Film_002
7	Fisheries <i>refugia</i> profile reports, including GIS maps and site characterisations, published for 14 priority sites	E-doc.	On-going
8	Terms of Reference for National Fisheries <i>Refugia</i> Committee	E-doc.	FR_TOR_001
9	Terms of Reference for National Scientific and Technical Committee	E-doc.	FR_TOR_002
10	Terms of Reference for National Site Management-Boards	E-doc.	FR_TOR_003
11	Terms of Reference for Regional Project Steering Committee	E-doc.	FR_TOR_004
12	Terms of Reference for Regional Scientific and Technical Committee	E-doc.	FR_TOR_005
13	Term of Reference for Project Coordinating Unit	E-doc.	FR_TOR_006
14	Term of Reference for National Lead Agency	E-doc.	FR_TOR_007
15	Report of the 1 st Regional Project Steering Committee Meeting	E-doc.	FR_RMC_001
16	Report of the 2 nd Regional Project Steering Committee Meeting	E-doc.	FR_RMC_002
17	Report of the 1 st Regional Scientific and Technical Committee Meeting	E-doc.	FR_RMC_003
18	Report of the 2 nd Regional Scientific and Technical Committee Meeting	E-doc.	FR_RMC_004
19	Report of the Regional Meeting on Indicators for Management of Fisheries	E-doc.	FR_RM_001
20	Report of the Regional Technical Consultative Meeting on Regional Action Plan for Management of Transboundary species: short mackerel in the Gulf of Thailand Sub-region	E-doc.	FR_RM_002

5. Evaluation from Participants of Member Countries for WS and Training Course

6. Major Impacts/Issues

Delay of quarterly reports on expenditures and progress report for co-finance calculation

PART III: PROPOSED ACTIVITIES FOR YEAR 2020

1. Proposed Activity/sub-activity, work plan and estimated budget for the year 2020

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget (USD)	Notes
COMPONENT 1	Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea	214,700	
COMPONENT 2	Improving the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-based for fisheries <i>refugia</i> management in the South China Sea	161,000	
COMPONENT 3	Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea	67,630	
COMPONENT 4	National cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea	357,100	
		800,430	

2. Expected Outcomes/Outputs of Activity for the year 2020

Proposed Activity / Component	Expected Outcomes/Outputs of Activity
Component 1	
Sub-activities	Fisheries <i>refugia</i> profile reports, including GIS maps and site characterisations, published for 15 priority sites
Component 2	
Sub-activities	Published national reviews & recommendations for reforms of national, provincial and municipal regulations/ordinances for responsible fishing practices at priority <i>refugia</i> ; and Characterisations for 15 <i>refugia</i> sites accessible online
Component 3	
Sub-activities	Awareness materials published online, and online national web portals on fisheries <i>refugia</i> Adopted Standardized Methods for Collection and Analysis of Data and Information for the use in Assessing the Impacts of Fisheries <i>Refugia</i> and in the Designing of Appropriate Indicators for Long Term Management of the Regional System of Fisheries <i>Refugia</i> Adopted Regional Action Plan for Management of Short Mackerel Adopted Regional guidelines on Indicators for Management of Fisheries <i>Refugia</i>
Component 4	
Sub-activities	Joint management decisions and participant lists; and scientific and technical advice and participants lists

3. Schedule of Activity for the year 2020

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activities												
Activity 2												
Sub-activities												
Activity 3												
Sub-activities												
Activity 4												
Sub-activities												

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

			Project ID: 201301007
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Offshore Fisheries Resources Exploration in Southeast Asia		
Program Strategy No.:	I	Total Duration:	2015 - 2019
Lead Department:	Training Department (TD)	Lead Country:	Viet Nam
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 640,244
Project Partner:	None	Budget for 2019:	USD 46,940
Project Leader:	Ms. Siriporn Pangsorn / TD	Project Participating Country(ies) :	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Currently, attempts of countries in the Southeast Asia have increasingly focused to expand their fishing activities to the offshore areas in their Exclusive Economic Zones where fisheries resources are still under-utilized as alternative marine fisheries resources. With the Resolution and Plan of Action No. 18 describes that “Investigate the potential of under-utilized fisheries resources and promote their exploitation in a precautionary manner based upon analysis of the best available scientific information”, SEAFDEC has duties to provide technical support to the Member Countries to explore these under-utilized offshore fisheries resources through various programs, *e.g.* Technical meetings, Workshops, and Trainings course in related to fisheries resource exploration, fisheries abundance, as well as stock assessment.

In order to fulfill the needs of the SEAFDEC Member Countries on the exploitation of marine fisheries resources and study on marine environment in the specific area beyond the coastal zone that include offshore and high sea, SEAFDEC/TD works in close collaboration with these Member Countries and other relevant partners at national, sub-regional, and regional and international levels, to conduct marine fisheries resources and study on marine environment with two (2) major specific areas *i.e.* (i) Fisheries research and oceanographic survey; and (ii) Human resource development on fisheries and oceanographic research survey, onboard navigation, and marine engineering training and fish handling onboard fishing vessel.

Since 2004, SEAFDEC has technically supported to Member Countries by utilization Research vessel(s) on the marine fisheries research resources survey beyond coastal area, in EEZs of these Member Countries. The outputs from the survey include cruise reports of the survey, technical documents related to fisheries, marine environment and other specific requirements. The project will also facilitate collaboration research survey in the area where fisheries resources, especially tuna resources such as yellowfin and skipjack, has being shared among the countries in Southeast Asia as well as the marine important species of SEAFDEC Member Countries.

2. Background and Justification

Over the past few years, SEAFDEC Member Countries have increased their interest to promote the exploration of offshore fisheries resources to reduce the pressure of over-exploited fisheries resources in near shore areas in their EEZ, at the same time to find alternative source of fisheries resources. This is in line with the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Regional Towards 2020, as mentioned in the Plan of Action # 18 “Investigate the potential of under-utilized fisheries resources and promote their exploitation in a precautionary manner based upon analysis of the best available scientific information”. In this connection, this project will provide technical support to the Member Countries in exploring the under-utilized fisheries resources beyond the coastal area, including offshore areas in their respective EEZ waters.

Project also encourages and facilitates to SESAFDEC Member Countries the collaborative implements the marine fisheries resources and marine environment research survey. The overall aims of collaborative research survey are to strengthen marine fisheries and environment information collection by research vessel, and to promote the offshore fisheries resources exploration through the research and human resources capacity by utilization of Training and Research Vessel, M.V. SEAFDEC 2.

In this connection, SEAFDEC in close collaboration with the Member Countries has supported exploration of fishery/living resources in the EEZ of the countries in SEA. The overall aims of this project are to encourage Member Countries to collect the information on the offshore fishery resources in terms of research and training facilities using M.V. SEAFDEC 2, and to build human resources capacity for offshore fishery resources exploration. In addition, the project provides technical support to develop human resources development of SEAFDEC Member Countries to improve fish handling onboard through the training program on fish handling techniques applicable to various fishing operations in Southeast Asia. Participants understand the importance of hygienic, cleanliness and important key factors contributing to reduction of post-harvest losses onboard.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: Organization of the Regional Offshore Fisheries Research Resource Exploration	Outcome 1: Set of data on the fisheries research resource for capture fisheries promotion or fisheries resource management	Output 1: 1.1) A set of scientific data for policy consideration on management and sustainable utilization of oceanic tuna in Sulu and Sulawesi Seas 1.2) Sets of SOPs for assessing the status of tuna resources in region or Sub-region Waters in Southeast Asia 1.3) Summary Report on the Technical Meeting on the Plan for the Survey Cruise of M.V. SEAFDEC 2 on Small Pelagic Fishery Resources Assessment in Viet Nam Marine Waters and Tentative Cruise Order of M.V. SEAFDEC 2 survey around Waters in Southeast Asia	Activity 1: Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas Progress of the tuna research work, direction and solution of the difficulties on data analysis to support the tuna research in SSSs as well as the future activities will also be discussed at the meeting. Activity 2: Regional (or Sub-regional) consultation to establish research survey for offshore fisheries resources in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 Activity 3: Supporting technical staff(s) of SEAFDEC/TD participate the cruise survey and participate to the technical meetings of sub-regional study/research on offshore fisheries resources survey.

Objective	Outcomes	Outputs	Activities
Objective 2: Developing for Improving Fish Handling at Sea	Outcome 2: Utilization of fisheries resources through improvement of post-harvest fish handling at sea onboard fishing vessels	Output 2: Report of the regional training course on post-harvest	Activity 4: Organize the regional training course on improvement of post-harvest fish handling at sea
Objective 3: Strengthening quality research survey on offshore fisheries resources, and promote value addition to marine fisheries products in Southeast Asian Region	Outcome 3: Efficiency of research survey on offshore fisheries resources and appropriate improvement of post-harvest fish handling	Output 3: Sampling gear used for fisheries resources survey and/or Promote the materials of the improve Fisheries Research Resource Exploration and package(s) of technical handbooks and training reports on improvement of post-harvest fish handling	Activity 5: Modification of the offshore sampling gears and technical project publications

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	Technical meetings on the results of tuna fisheries resources survey in Sulu and Sulawesi seas. As planned through a series of the technical meetings on tuna research in Sulu and Sulawesi Seas, preliminary results of M.V. SEAFDEC 2 cruise survey on tuna resources in Sulu and Sulawesi Seas.
Activity 2: Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel	Supporting SEAFDEC technical staffs to conduct the consultation visit on planning of offshore fisheries resources research survey in Southeast Asia Waters by using of M.V. SEAFDEC 2 or other national research vessel.
Activity 3: Technical Support to SEAFDEC staff(s) for participates in the cruise survey and the meetings/workshop/ symposium	Supporting technical staff(s) of SEAFDEC/TD participate the cruise survey and the meetings/workshop/symposium to promote result of project Offshore Fisheries Resources Exploration in Southeast Asia. In addition, activity has also aimed to facilitate invited expert of SEAFDEC Member Countries technically visit to SEAFDEC for technical collaboration.

Activity	Description
Activity 4: Organize the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea and study on the assessment of post-harvest loss in Southeast Asia	National or regional activities (Training/Workshop/Meeting) on the improvement of the fish handling at sea aim to identify problem of the post-harvest fish handling both onshore and onboard fishing vessel of SEAFDEC Member Countries and seek for the recommendation on future improvement of post-harvest fish handling both onshore and onboard fishing vessel. Activities include research study to assess post-harvest fish loss in Southeast Asia Region.
Activity 5: Modification of the offshore sampling gears and technical project publications	<p>In order to strengthen research survey on offshore fisheries resources, in particular, the tuna resource research survey in Sulu and Sulawesi Seas, continuation on modification of sampling gear used with M.V. SEAFDEC 2 cruise survey will be carried out. A number of sampling gears will be redesigned.</p> <p>In order to promote value addition marine fisheries products in Southeast Asian Region, promotional materials including with package(s) of technical handbooks and training reports on improvement of post-harvest fish handling will be disseminated through the project website.</p> <p>Project also conducts the compilation and revision of the technical handbook or guideline of SOP on sampling gears and survey methodology for offshore fisheries resources exploration. These publications will be disseminated both by documents and website.</p>

3.3 Activity, Sub-activity and Proposed Budget for 2014-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2014	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
Activity 1: Technical meetings on the results of the tuna fisheries resources survey in Sulu and	Sub-activity 1.1 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas		15,000	12,000	20,000	15,000	20,000
Sulawesi Seas	Sub-activity 1.2 Study on the stock structure of tuna in Sulu and Sulawesi Seas.					20,409	7,000
Activity 2: Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel	Sub-activity 2.1 Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel				2,000	3,000	1,200
	Sub-activity 2.2 Marine fisheries resources research survey in the Gulf of Thailand					300,000	

Activity	Sub-Activity	Y1 2014	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
Activity 3: Technical Support to SEAFDEC staff (s) for participating in the cruise survey and the meetings /workshop/ symposium	Sub-activity 3.1 Technical Support of SEAFDEC staff (s) to the cruise survey and the meetings/ workshop/symposium	4,000	4,000	5,000	5,000	5,000	2,240
Activity 4: Improvement Program of the Fish Handling at Sea	Sub-activity 4.1 Organize the Regional activities (Training/Workshop/ Meeting) on the improvement of the fish handling at sea	45,900	15,900	16,000	15,000	18,595	15,000
	Sub-activity 4.2 Regional activities (Training/ Workshop /Meeting) on the improvement of the fish handling at sea				2,000	30,000	
Activity 5: Modification of the offshore sampling gears and technical project publications	Sub-activity 5.1 Modified semi-pelagic and mid-water trawl net for small pelagic fisheries research resources survey	4,000	4,000	5,000	4,000	20,000	0
	Sub-activity 5.2 Set of technical documents of Joint Program on Tuna Research in Sulu and Sulawesi Seas/Project publications					2,500	1,500
	Sub-Total Budget	53,900	38,900	38,000	48,000	414,504	46,940

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Project has objective to implement the Joint Research Program for Tuna Research Survey in Sulu-Sulawesi Sea by technical support to SEAFDEC Member Countries by collaboratively conduct the research activities on tuna stock assessment in Sulu and Sulawesi Seas based on the sequence of the activities planned/adjusted by the working groups as agreed at the Sulu and Sulawesi seas meeting in 2014. In year 2019, training course on stock assessment by using ASFIC Model has provide to Participating Countries of the project. Stock structure by using skipjack otolith has been introduce to IMP- Countries. At this stage, Indonesia is conducting the skipjack Otolith sample collection.

Project also supported to Department of Fisheries Malaysia to develop the cruise plan of M.V. SEAFDEC 2 on the sea trial of mid-water trawl in Sarawak Waters, Malaysia. The sea trial operation was conducted from 5 to 29 September 2019 and supports 15 researchers of DOF Malaysia to join the cruise. Project support the technical meeting to evaluation of the Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand and ways forward on the human resource development on the fisheries resources survey in the Gulf of Thailand, *i.e.* Cambodia, Thailand and Viet Nam. In addition, SEAFDEC/TD invited Japanese resource person (*Dr. Yoshinobu Konishi*) to visit TD for improves fish larvae identification at SEAFDEC/ TD.

The identification guidebook of the Scombrid fishes and their larvae in the Southeast Asian Region was drafted and agree to develop with the supporting Thai researchers.

In parallel with the promotion on sustainable resources utilization, project has supported the responsible practices on fish handling technology at sea since 2013. The Regional Training Course on Fish Handling Techniques Applicable to Various Fishing Operations in Southeast Asia organized by Training Department of SEAFDEC, at Training Department. Project supported SEAFDEC researchers presented project result in two international conferences. Mid-water trawl and automatic squid jigging was modified from the original to support the sea trial of mid-water trawl in Sarawak Waters, Malaysia.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1: Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	Training	6	2		20,000
Activity 2: Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel	Research	15	5		1,200
Activity 3: Technical Support to SEAFDEC staff (s) for participating in the cruise survey and the meetings /workshop/ symposium	Research	5	2		6,000
Activity 4: Regional training course on fish handling Techniques Applicable to Various Fishing Operations in Southeast Asia	Training	10	3		15,000
Activity 5: Modification of the offshore sampling gears and technical project publications	Research			100	5,000

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.1 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	Report on the training workshop on Tuna Stock Assessment for YFT, BET and SKJ resources in SSSs by using GLM CPUE standardization, ASPIC, and Kobe Plot to update stock status of tuna in SSSs.	Improve human resources capacity on Tuna Stock Assessment for YFT, BET and SKJ resources in SSSs by using GLM CPUE standardization, ASPIC, and Kobe Plot to update stock status of tuna in SSSs for Philippines (Planning in December 2019). Improve human resources capacity on Tuna Stock Risk Assessment for Yellowfin Tuna, Bigeye Tuna and Skipjack Tuna Resources in Sulu and Sulawesi Seas (SSSs).
Sub-activity 1.2 Study on the stock structure of tuna in Sulu and Sulawesi Seas.	Preliminary study on the stock structure of tuna in SEA, Skipjack tuna stock structure study by using otolith will be implemented at pilot site in Indonesia, Malaysia, and Philippines (SSSs).	Improve human resources capacity on skipjack otolith sampling of Indonesia and Malaysia and Otolith sample collection in Indonesia.
Activity 2		
Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC2 or other national research vessel	M.V. SEAFDEC 2 support SEAFDEC Member Countries on the Research Survey on Marine Fisheries and Marine Environment	1) Agree cruise plan M.V. SEAFDEC 2 of the sea trial of mid-water trawl in Sarawak Waters, Malaysia from 5-29 September 2019. 2) M.V. SEAFDEC 2 complete sea trial of mid-water trawl using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia from 5-29 September 2019 3) Evaluation of the Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand and ways forward
Activity 3		
Japanese resource person (Dr. Yoshinobu Konishi) one-month advisory visit to improve fish larvae identification at SEAFDEC/TD	Regional expert supported research study on the larvae identification in Southeast Asia	1) Report on the Consultation Workshop on the Preparation of Guidebook for Identification Scombrid; Adult and Larvae in Southeast Asia 2) Draft of the identification guidebook of the Scombrid fishes and their larvae in the Southeast Asian Region
Activity 4		
Regional training course on fish handling Techniques Applicable to Various Fishing Operations in Southeast Asia	Participants expected to enhance knowledge and practical skills on reduction of post-harvest losses and improve awareness of hygiene and	1) Participants enhance knowledge and practical skills on reduction of post-harvest losses 2) Strategies/ways forward to improve fish handling in assigned coastal and offshore fisheries cases in Southeast Asia

Planned activity	Expected outcome/output	Achievements
	practice of fish handling onboard fishing fleet	
Activity 5		
Sub-activity 5.1 Technical project publications	Article in the Proceeding of International Conference on Fisheries Engineer	SEAFDEC staff presented the preliminary result on marine debris survey in collaborative research survey on marine fisheries and marine environment in the Gulf of Thailand in the International Conference on Fisheries Engineer at Nagasaki University Japan
Sub-activity 5.2 Modification of the offshore sampling gears	Mid-water trawl and accessories	Modify mid-water trawl net and accessories for the sea trial of mid-water trawl using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia from 5-29 September 2019

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
Report on the training course on Risk Assessment to improve tuna stock for yellowfin tuna, bigeye tuna and skipjack tuna resources in Sulu and Sulawesi Seas (SSSs).	Hard copy	
Report on the Consultation Meeting on the Utilization of the M.V. SEAFDEC 2 for the Sea Trial of Mid-water Trawl Using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia	Hard copy	
Report on the Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand in the proceeding International Conference on Fisheries Engineer	Hard copy and Presentation	
Report on the Consultation Workshop on the Preparation of Guidebook for Identification Scombrid; Adult and Larvae in Southeast Asia	Hard Copy	
Article in Fish Vol. 17 No. 2 for the People Sustained Utilization of SEAFDEC Vessels through Collaborative Research Surveys: Marine Resources Survey of the Gulf of Thailand using the M.V. SEAFDEC 2	Hard copy	
Training report the Regional training course on fish handling Techniques Applicable to Various Fishing Operations in Southeast Asia (4-8 November 2019)	Hard copy	
Abstract entitle Relationship on the Characteristics of Trawl Net, Otter board and Trawler in Thailand in proceeding of the ICES-FAO Working Group on Fishing Technology and Fish Behavior (WGFTFB) 2019	Hard copy	
Article entitle Preliminary Result on Marine Debris Survey in Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand in the International in the Proceeding of International Conference on Fisheries Engineer (ICFE) 2019	Hard copy	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1	Malaysia and Indonesia appreciate SEAFDEC on the organizing the resource persons support to the training course on Risk Assessment to improve tuna stock for yellowfin tuna, bigeye tuna and skipjack tuna resources in Sulu and Sulawesi Seas (SSSs).
Activity 2	Participant from 3 Member Countries <i>i.e.</i> Cambodia, Thailand and Viet Nam identified the issues, constraints and needs in the evaluation meeting of Marine fisheries resource and Marine environment in the Gulf of

Planned activity	Evaluation/ Views from Participants
	Thailand. All participating countries requested to SEAFDEC provide more technical support to their staffs as well as allocate funding to the survey in the future. Malaysia appreciated SEAFDEC to support the Sea Trial of Mid-water Trawl Using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia.
Activity 3	Regional larvae expert agreed to draft of the identification guidebook of the Scombrid fishes and their larvae in the Southeast Asian Region. In addition, participants from Department of Fisheries Thailand has been advised by Dr. Yoshinobo Konishi on the larvae identification of the samples collected in the Gulf of Thailand.
Activity 4	Due to the training program plans to conduct during 4-8 November 2019, Evaluation/ Views from Participants can not described during develop the project document.
Activity 5	Organizer of the ICES-FAO WGFTFB 2019 and International Conference on Fisheries Engineer 2019 extended appreciate to SEAFDEC on the participation of SEAFDEC researchers in both conferences.

6. Major Impacts/Issues

Tuna is significantly important not only import-exports value, but also domestic consumptions in a number of Member Countries of SEAFDEC. Similar initiatives on tuna or other pelagic species which the stock is sharing among the countries are needed in the future for strengthening cooperation among the countries concerned as well as to build the capacity of human resources for assessment of status of such important species and stock structure in Southeast Asia Region.

In order to support SEAFDEC Member Countries, SEAFDEC should organize regional technical meeting to improve the collaborative survey on marine fisheries resources and marine environment. The overall objectives of regional technical meeting are sharing information on marine fisheries resources and marine environmental situation in Southeast Asia (ii) Increasing number of experience researchers on marine fisheries resources and marine environment,(iii) Strengthen coordination and network of fisheries and oceanography scientist/researcher in Southeast Asia, and (iv) Maximizing the efficiencies and benefit of the SEAFDEC research vessel, research equipment to support on marine fisheries resources and marine environment survey of SEAFDEC Member Countries. Beside of funding constraint, MCs has trouble with human resources capacity to analyze data to support fisheries policy.

Regional training course on fish handling technique, applicable to various fishing operation in Southeast Asia has a language barrier among the participants. Some participants requested for more practical session and field trips (few vessels). They however evaluated that the training functioned well on facilitation, resource persons, coordination among course, lectures & practices, training documents and methods, teamwork. They also evaluated that training provided appropriate knowledge for their works and countries. Obviously that HRD on the fish handling technique is needed for SEAFDEC Member Countries. The activities should extend to the next phase of Japanese Trust Fund Project in 2020-2025.

In order to follow up the global fisheries status and trend, SEAFDEC will send researchers to participate the international conference and symposium to present the SEAFDEC activities and research studies. This will support the project planning to deal with fisheries status and trend for Southeast Asia region.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

Project support implementation of Joint Research Program for Tuna Research Survey in Sulu-Sulawesi Sea by technical support to SEAFDEC Member Countries locate around Sulu and Sulawesi Seas, *i.e.* Indonesia, Malaysia and Philippines on the research study in Stock assessments of yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*) and skipjack tuna (*Katsuwonus pelamis*) in Sulu and Sulawesi Seas. Project also encourages and facilitates to SEAFDEC Member Countries to conduct the collaborative implements the marine fisheries resources and marine environment research survey by utilization of Training and Research Vessel, M.V. SEAFDEC 2. Six (6) cruise of M.V. SEAFDEC 2 had been conducted since year 2014. SEAFDEC in collaborate with National Fisheries University of Japan provided human resource capacity building on marine fisheries resources and marine environment research survey to Fisheries Administration of Cambodia during 2014-2016.

Project provides technical support to develop human resources development of SEAFDEC Member Countries to improve fish handling onboard through the training program on fish handling techniques applicable to various fishing operations in Southeast Asia. 172 Participants understand the importance of hygienic, cleanliness and important key factors contributing to reduction of post-harvest losses onboard. Project distributes result of the study on tuna abundance in Sulu and Sulawesi Seas and cruise survey by M.V. SEAFDEC 2 to all members. Project supported SEAFDEC researchers presented project result in the international conferences.

2. Implemented Activities/sub-activities in the Overall Project Duration

Activity	Description
Activity 1: Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	Project support implementation of Joint Research Program for Tuna Research Survey in Sulu-Sulawesi Sea by technical support to SEAFDEC Member Countries locate around Sulu and Sulawesi Seas, <i>i.e.</i> Indonesia, Malaysia and Philippines on the research study in Stock assessments of yellowfin tuna (<i>Thunnus albacares</i>), bigeye tuna (<i>Thunnus obesus</i>) and skipjack tuna (<i>Katsuwonus pelamis</i>) in Sulu and Sulawesi Seas. Technical meetings on the results of tuna fisheries resources survey in Sulu and Sulawesi seas. As planned through a series of the technical meetings on tuna research in Sulu and Sulawesi Seas, preliminary results of M.V. SEAFDEC 2 cruise survey on tuna resources in Sulu and Sulawesi Seas
Activity 2: Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel	Supporting SEAFDEC technical staffs to conduct the consultation visit on planning of offshore fisheries resources research survey in Southeast Asia Waters by using of M.V. SEAFDEC 2 or other national research vessel.
Activity 3: Technical Support to SEAFDEC staff(s) for participates in the cruise survey and the meetings/ workshop/ symposium	Supporting technical staff(s) of SEAFDEC/TD participate the cruise survey and the meetings/workshop/symposium to promote result of project Offshore Fisheries Resources Exploration in Southeast Asia. In addition, activity has also aimed to facilitate invited expert of SEAFDEC Member Countries technically visit to SEAFDEC for technical collaboration.
Activity 4: Organize the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea and study on the assessment of post-harvest loss in Southeast Asia	National or regional activities (Training/Workshop/Meeting) on the improvement of the fish handling at sea aim to identify problem of the post-harvest fish handling both onshore and onboard fishing vessel of SEAFDEC Member Countries and seek for the recommendation on future improvement of post-harvest fish handling both onshore and onboard fishing vessel. Activities include research study to assess post-harvest fish loss in Southeast Asia Region

Activity	Description
<p>Activity 5: Modification of the offshore sampling gears and technical project publications</p>	<p>In order to strengthen research survey on offshore fisheries resources, in particular, the tuna resource research survey in Sulu and Sulawesi Seas, continuation on modification of sampling gear used with M.V. SEAFDEC 2 cruise survey will be carried out. A number of sampling gears will be redesigned.</p> <p>In order to promote value addition marine fisheries products in Southeast Asian Region, promotional materials including with package(s) of technical handbooks and training reports on improvement of post-harvest fish handling will be disseminated through the project website.</p> <p>Project also conduct the compilation and revision of the technical handbook or guideline of SOP on sampling gears and survey methodology for offshore fisheries resources exploration. These publications will be disseminated both by documents and website.</p>

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
<p>Activity 1: Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas</p>	<p>Technical support to Member Countries around Sulu and Sulawesi Seas, <i>i.e.</i> Indonesia, Malaysia and Philippines on the research study in Stock assessments of yellowfin tuna (<i>Thunnus albacares</i>), bigeye tuna (<i>Thunnus obesus</i>) and skipjack tuna (<i>Katsuwonus pelamis</i>) in Sulu and Sulawesi Seas including Standard Operational Procedure (SOP) to conduct data collection and assessing the status of tuna resources in region or Sulu and Sulawesi sub-region in Southeast Asia, report on the stock assessments of yellowfin tuna (<i>Thunnus albacares</i>), bigeye tuna (<i>Thunnu sobesus</i>) and skipjack tuna (<i>Katsuwonus pelamis</i>) in Sulu and Sulawesi Seas by using Kobe plot, ASPIC Model and risk assessment. More than 30 researchers of Indonesia, Malaysia, and Philippines involve in the project.</p>
<p>Activity 2: Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel</p>	<p>SEAFDEC provide technical assistance to SEAFDEC MCs to develop the cruise plans of marine fisheries resources research survey in Southeast Asia by using of M.V. SEAFDEC 2 or other national research vessel, <i>i.e.</i> The first Joint Research Program on Tuna Resources Survey in the Sulu and Sulawesi Seas within the EEZ of Indonesia, Malaysia and Philippines. (2014), the second Joint Research Program on Tuna Resources Survey in the Sulu and Sulawesi Seas within the EEZ of Indonesia, Malaysia and Philippines. (2015), Demersal Fisheries Resources Survey Using M. V. SEAFDEC 2 in the EEZ Waters of the East Coast of Peninsular Malaysia (2016), Survey cruise of M.V. SEAFDEC 2 on small pelagic fishery resources assessment in Viet Nam Marine Waters (2017), Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand (2018) and Sea Trial of Mid-water Trawl Using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (2019). There are 169 researchers involve with the cruise survey since year 2015.</p>
<p>Activity 3: Technical Support to SEAFDEC staff(s) for participates in the cruise survey and the meetings/ workshop/ symposium</p>	<p>SEAFDEC in collaborate with National Fisheries University of Japan provide human resource development to Fisheries Administrative researcher of Cambodia on the marine fisheries resources and marine environment research survey by utilization of Training and Research Vessel Koyo Maru, in year 2014, 2015 and 2016. There were sixteen (16) FiA researchers and eight (8) SEAFDEC staffs joined cruise survey during year 2014 - 2016. Project also supported the human resource development of SEAFDEC researcher to join the cruise survey in the UM-17-09, project “Integrating Study Programme of the Marine Ecosystem of the Indian Ocean Sector of the Southern Ocean” (31 December 2017 to 23 January 2018) by TRV Umitaka Maru.</p> <p>SEAFDEC support FiA Cambodia researchers enhance their skill on fish</p>

List of Activities	Achievements and Outcomes/Outputs of Activities
	larvae identification in year 2017. SEAFDEC Department of Fisheries, Thailand in the national training course on the utilization of ASPIC Software and Kobe Plot for Assessing Status of Fisheries Resources organize by Department of Fisheries Thailand in and support the national fishing technology training course organized in Department of Fisheries Malaysia in 2018.
Activity 4: Organize the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea and study on the assessment of post-harvest loss in Southeast Asia	Participants expected to enhance knowledge and practical skills on reduction of post-harvest losses which will help reinforce extension and promotion activities in their respective countries. Since year 2015, SEAFDEC improve human resources on fish handling at sea to reduce post-harvest loss in Southeast Asia, total number of trainees in the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea and study on the assessment of post-harvest loss in Southeast Asia 172 fisheries officers.
Activity 5: Modification of the offshore sampling gears and technical project publications	There are sixteen (16) publications distributed to the region. List of publication presented in topic 5. Various fishing gear <i>e.g.</i> demersal trawl, mid-water trawl, tuna longline, and automatic squid jigging has been modified in order to provide technical support to SEAFDEC MCs on the national fisheries resources research survey in their countries.

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Tuna is significantly important not only import-exports value, but also domestic consumptions in a number of Member Countries of SEAFDEC. Similar initiatives on tuna or other pelagic species which the stock is sharing among the countries are needed in the future for strengthening cooperation among the countries concerned as well as to build the capacity of human resources for assessment of status of such important species and stock structure in Southeast Asia Region. Project provide technical assistant to improve human resourced development on stock assessment of highly migratory tunas species in Sulu Sulawesi Sea. Stock assessment model provide for participating countries *i.e.* Indonesia, Malaysia and Philippines are the same as using in Regional Fisheries Management Organization (RFMO) *e.g.* IOTC, WCPFC, that countries can use to study on tunas in their national waters.

To support offshore fisheries resources research exploration, SEAFDEC provide technical assistant both planning process and budget estimation of cruise survey and support Research Vessels *i.e.* M.V. SEAFDEC 2. Countries obtained significant data to evaluate monitor fisheries resources status for policy development. However, SEAFDEC has not yet supported SEAFDEC Member Countries to organize regional technical meeting, to improve the collaborative survey on marine fisheries resources and marine environment. The overall objectives of regional technical meeting are sharing information on marine fisheries resources and marine environmental situation in Southeast Asia (ii) Increasing number of experience researchers on marine fisheries resources and marine environment, (iii) Strengthen coordination and network of fisheries and oceanography scientist/researcher in Southeast Asia, and (iv) Maximizing the efficiencies and benefit of the SEAFDEC research vessel, research equipment to support on marine fisheries resources and marine environment survey of SEAFDEC Member Countries. Beside of funding constraint, MCs has trouble with human resources capacity to analyze data to support fisheries policy.

Regional training course on fish handling technique, applicable to various fishing operation in Southeast Asia has a language barrier among the participants. Some participants requested for more practical session and field trips (few vessels). They however evaluated that the training functioned well on facilitation, resource persons, coordination among course, lectures & practices, training documents and methods, teamwork. They also evaluated that training provided appropriate knowledge for their works and countries. Obviously that HRD on the fish handling technique is needed for SEAFDEC Member Countries. The activities should extend to the next phase of Japanese Trust Fund Project in 2020-2025.

In order to follow up the global fisheries status and trend, SEAFDEC will send researchers to participate the international conference and symposium to present the SEAFDEC activities and research studies. This will support the project planning to deal with fisheries status and trend for Southeast Asia region.

5. Publications and Others

1. Report (internal used only) Stock assessments of yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*) and skipjack tuna (*Katsuwonus pelamis*) in Sulu and Sulawesi Seas (Hard copy)
2. Scientific Report entitles Stock Assessments of yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnu sobesus*) and skipjack tuna (*Katsuwonus pelamis*) in Sulu and Sulawesi Seas by ASPIC Model (Hard copy)
3. Technical Report on the Distribution of Fish aggregating devices (FADs) around SSSs (Hard copy)
4. Survey Report on Fisheries Resources Abundance around SSSs by Using Hydroacoustic Equipment (Hard copy)
5. SOPs for assessing the status of tuna resources in region or Sulu and Sulawesi sub-region in Southeast Asia (Hard copy)
6. Report on the training course raining workshop on Tuna Stock Assessment for YFT, BET and SKJ resources in SSSs by using GLM CPUE standardization, ASPIC, and Kobe Plot to update stock status of tuna in SSSs. (Hard copy)
7. Survey Proposal on the Collaborative Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Hard Copy)
8. Summary Report on the Technical Meeting on the Plan for the Survey Cruise of M.V. SEAFDEC 2 on Marine fisheries resource and Marine environment in the Gulf of Thailand (Hard Copy)
9. Summary Report on the Technical Meeting on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Viet Nam Waters) (Hard Copy)
10. Summary Report on the Technical Meeting on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia Waters) (Hard Copy)
11. Summary Report on the Technical Meeting on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Thailand Waters) (Hard Copy)
12. Draft Standard Operation Procedure on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia, Thailand, and Viet Nam Waters) (Hard Copy)
13. Cruise Report on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia, Thailand, and Viet Nam Waters) (Hard Copy)
14. Training Report of the On-site Training Course on Proper Fish Handling Techniques Applicable to local fishing vessels (Hard Copy)
15. Abstract entitle Relationship on the Characteristics of Trawl Net, Otter board and Trawler in Thailand in proceeding of the ICES-FAO Working Group on Fishing Technology and Fish Behavior (WGFTFB) 2019
16. Article in Fish Vol. 17 No. 2 for the People Sustained Utilization of SEAFDEC Vessels through Collaborative Research Surveys: Marine Resources Survey of the Gulf of Thailand using the M.V. SEAFDEC 2

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

Project ID: 201301008			
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region: <i>Activity 2. Improving the Data Collection of the Commercially-exploited Aquatic and Threaten Species</i>		
Program Strategy No. :	I	Total Period:	2013–2019
Lead Department:	Training Department (TD)	Lead Country:	Viet Nam
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 277,700
Project Partner:	Marine Fishery Resources Development and Management Department (MRDMD)	Budget for 2019:	USD 40,000
Project leader:	Sukchai Arnupapboon / TD	Project Participating Country(ies):	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

In the past decades, shark and ray species have become one of the valuable fisheries resources and commodities in the Southeast Asian countries by contributing to the livelihood of fishers, traders and exporters. Recently, nine (9) species of sharks and seven (7) species of rays have been listed under the CITES-Appendix II after the Seventeenth Conference of the Parties (CoP17), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). International trading of CITES-listed shark and ray species are regulated by the CITES Management Authority by permit.

However, some CITES-listed shark and ray species are considered as common species and caught regularly during the fishing activities in the SEAFDEC Member Countries (MCs). In order to respond to the issue, SEAFDEC in collaboration with MCs formulated a project to improve the data collections on sharks and rays. It aims to enhance the capability of fishery sectors in compiling and utilizing fishery statistics and information of sharks and rays since 2013. The main outcome of the Project is that MCs are able to collect shark and ray data at species level as well as the data will be used for the most important section in Non-detrimental Findings (NDFs) documents, to support for developing a Shark National Plan of Action (NPOA), and to provide scientific evidences, particularly stock assessment for sustainable fisheries management of sharks and rays.

2. Background and Justification

In 2013, the project activities focused on the collections of data and information for commercially-exploited species of sharks and rays. This was to follow up the outputs from a series of events, including the Technical Meetings organized by the SEAFDEC Training Department (TD) in Thailand in 2011 and 2012, and the Regional Training Course on Shark Species Identification organized by SEAFDEC Marine Fishery Resources Development and Management Department (MFRDMD) early 2012. The outputs from those meetings and training course showed that the information on shark stock status in MCs was not yet reliable because, in general, species-by-species statistics of sharks were lacking which include the information on stock structure, abundance, life history and reproductive capacity. Further, insufficient policy and financial supports on research and management of sharks and rays were common key issues in the region. The Project aims at continuing to support MCs for improving quality and timeliness of data and information on sharks.

In 2014, the project activities emphasized on enhancing shark data collections by improving national capacities of species identification through organizing a regional training course for researchers/officers of

MCs. The aim of the regional training course was to train trainers, who could pass the gained knowledge to their local enumerators for sharks and rays through conducting a national training course.

In 2015, the Project organized the Regional Technical Meeting on Shark and Ray Data Collection and Project Planning Year 2015-2016, to compile and analyze shark data at regional level and also develop a plan of data collection activities in the project participating countries, who agreed on the financial support, the format and template for shark and ray data collections, and the workplans.

In year 2015-2016. Standard Operational Procedures (SOP) of shark and ray data collections was developed and verified by the participating countries. With financial support of the Government of Japan (through the SEAFDEC Secretariat and MFRDMD) and the European Union (EU) (through the CITES Secretariat), the one-year SEAFDEC-EU Regional Project on Sharks and Rays Data Collection was implemented from 2015 to 2016 in six (6) MCs; namely, Cambodia, Indonesia, Malaysia, Myanmar, Thailand and Viet Nam.

In 2017, the Project emphasized on determining appropriate model for converting shark and ray data to shark and ray stock information to provide such scientific information to fisheries managers. Additionally, the Project continuously supported data collection activities in Cambodia because shark and ray data were still insufficient for stock assessment and it was also found that Cambodia still needs more technical support on building human resources capacity on shark and ray identification at species level.

In 2018, the Project organized Training Workshop on Assessment Resource and Fisheries Status of Sharks and Rays. The training workshop aimed to build national capacities of MCs to utilize data for fisheries management. Further, the Project initiated to support data collection activities for three landing sites, including Cilacap in Indonesia, Tawau in Malaysia, and Songkhls in Thailand.

In 2019, the Project organized Training Workshop on Age Determination by Using Vertebra of Sharks and Rays. It was conducted with the aim to increase the accuracy of resource status assessment. Further, a shark and ray database was developed, and a training was conducted in three MCs (*i.e.* Indonesia, Malaysia and Thailand) to use the database.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Outputs of the Project

Objectives	Outcomes	Outputs	Activities
Objective 1: Improve human resource capacity in Sharks and Rays identification in the national level and utilization data for management scheme	Outcome 1: National data collection system at landing site sharks and rays Shark and ray resource management plan of action	Output 1: Human resources on shark and ray data collections, taxonomy identification and assessment for	Activity 1: Human resource development on data collection procedure, identification of species and assessment on shark and ray resource status
Objective 2: 2.1) Improve data collection both existing data set and quality of data set to improve fisheries management	Outcome 2: 2.1) National data and database at landing site of sharks and rays	Output 2: Data set of landing sharks and rays available at species level Sharks and rays information updated National network on Shark and Ray Identification	Activity 2: Support SEAFDEC Member Countries to implement shark data collections at landing site(s) Sub-activity 2.1 Shark and ray data collections in Southeast Asian Countries Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection

Objectives	Outcomes	Outputs	Activities
	2.2) Data utilization for management and conservation of sharks and rays (Data quality to investigate stock assessment of Sharks and Rays)	Appropriate method to utilize data to assess shark and ray resources status and fishery status based on ASEAN's existing data Regional network on sharks and rays identification and stock assessment	Sub-activity 2.3 Improve quality of data collection to support fisheries management (Determining and on appropriate model for assessing resource and fishery status of sharks and rays)
Objective 3: 3.1) To provide national and regional references on shark or ray data collection and follow- up the trend on shark and ray conservation and management both regional and global level 3.2) Technically support the MCs where NPOA-Shark has not been formulated yet	Outcome 3: 3.1) National and regional reference on shark or ray data collection 3.2) Drafted NPOA-Shark of SEAFDEC MCs where NPOA-Shark has not been formulated yet (As requested by Member Countries)	Output 3: National report on sharks and rays data collection Regional analysis of the sharks and rays landing in the Participating Countries Standard Operating Procedures (SOP) of shark and ray data collection and field guides on sharks and rays species identification	Activity 3: Sub-activity 3.1: Information dissemination Sub-activity 3.2: Participate to Relevant Regional and International Forum

3.2 Overall Scope/Description of Project

Activities	Description
Activity 1: Human resource development programs through the project Improvement of sharks data collection in Southeast Asia	These regional activities aim to improving capacity of Southeast Asian researcher for collecting shark and ray data at species level and utilizing landing data for sustainable fishery management. Activities compose of training/ workshop/ meeting which is a part to encourage SEAFDEC MCs having ability to develop Shark NPOA and NDF Document.
Activity 2: Supported SEAFDEC Member Countries to implement shark data collection at landing site(s) Sub-activity 2.1: Sharks and rays data collection in Southeast Asian Countries Sub-activity 2.2: Monitoring process in the participating countries of sharks and rays data collection Sub-activity 2.3 Improve quality of data collection to support fisheries management	<p>Southeast Asian region have limit of species statistics of sharks and rays resulting to insufficient scientific evident to support policy maker to develop Shark NPOA and NDF document.</p> <p>These activities encourage participating countries to collect shark and ray data at species level by supporting budget and technical. All participating countries could publish national report of shark and ray data collections at species. The activities also design data management platform namely SEAFDEC's shark and ray database in order to store and share data for management fisheries in regional in advance.</p> <p>Eleven (11) selected landing sites in Southeast Asian is supported as pilot for data collection activities. Enumerator of each countries record shark and ray data including catch, biology and fishing ground. Record activities conduct five days per month and number of recorded fishing boat per month is at least 12.</p> <p>In order to ensure the implementation of shark landing data is systematically and correctly at the landing sites, SEAFDEC/TD and MFRDMD monitored enumerator at the landing site and also validate of data in participating countries.</p>

Activities	Description
	To improve quality of data collection to support fisheries management, determining on appropriate stock assessment model for sharks and rays is conducted. The existing landing data in region are converted to valuable information (sharks and rays resource status) and disseminate to policy maker.
Activity 3 Sub-activity 3.1 Information dissemination Sub-activity 3.2 Participate to Relevant Regional and International Forum	<p>Reports/publications of the national shark and ray data collection is disseminated to provide the information to manage shark and ray fisheries. Reports will be used as a reference by SEAFDEC Departments, Member Countries, fisheries-related agencies and organizations as well as the general public.</p> <p>This activity has also been collaborated with other relevant initiatives, organizations, and partners, in particular with the issues related to shark data collection. In this connection, the activity includes participation of staff in the regional and international meeting or forums, <i>e.g.</i> WCPFC, IOTC, CITES, etc. to monitor on the current issues that has significant information to sustainable utilization of Sharks and Rays.</p>

3.3 Activity, Sub-activity and Proposed Budget for 2014-2019

Activities	Sub-Activities	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1: Human resource development programs	Sub-activity 1.1 Human resource development programs	27,000	27,000	27,000	22,000		32,300	28,000
Activity 2: Support SEAFDEC Member Countries to implement shark data collection at landing site(s)	Sub-activity 2.1 Sharks and rays data collection in Southeast Asian Countries					3,000	13,650	9,000
	Sub-activity 2.2 Monitoring process in the participating countries on sharks and rays data collection	4,000	4,000	4,000	4,000	5,000	9,300	
	Sub-activity 2.3 Improve quality on data collection to support fisheries management					32,500		
Activity 3 Information dissemination	Sub-activity 3.1 Information dissemination	1,000	1,000	1,000	1,000	2,000	3,950	500
	Sub-activity 3.2 Participate to Relevant Regional and International Forum				3,000	5,000	5,000	2,500
Total		32,000	32,000	32,000	30,000	47,500	64,200	40,000

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

The major achievement of the project implementation in 2019 was the activities of the capacity building on “Age Determination Using Vertebra for Sharks and Rays” and “Key-in Data and Data Report for SEAFDEC Regional Shark and Ray Database”. The Training Course on Age Determination Using Vertebra for Sharks and Rays was conducted with nineteen (19) participants from eight (8) MCs; namely, Cambodia, Indonesia, Japan, Malaysia, Myanmar, Philippines, Thailand and Viet Nam. The training course was specifically designed for determining age of sharks and rays for formulating growth rates which results could attain the more reliable stock assessment model. The Key-in Data and Data Report for SEAFDEC Regional Shark and Ray Database Practical Workshop aimed to strengthening the skills of key-in and usage of SEAFDEC regional sharks and rays database for local enumerators as well as improving the SEAFDEC regional database.

Three landing sites were supported for shark and ray data collections. Two sites were selected as base of demersal sharks and rays and another site as base of pelagic. With guidance from Project Advisors, twelve (12) months of shark and ray data collections starting July 2019 to June 2020 has been recorded, and a national report of shark and ray data collections will be published, which could support policy makers for their decision for developing a National Plan of Action (NPOA) in near future.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activities	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Human resource development programs					
Sub-activity 1.1 Human resource development programs		19	6	5	28,000
Activity 2 Support Member Countries to implement shark data collection at landing site(s)					
Sub-activity 2.1 Sharks and rays data collection in Southeast Asian Countries		3			9,000
Activity 3 Information dissemination					
Sub-activity 3.1 Information dissemination					1,500
Sub-activity 3.2 Participate to Relevant Regional and International Forum					1,500

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.1	Ability of researchers of SEAFDEC MCs on the age determination and be able to make growth rate based	Capacity building on Age determination by using vertebra of sharks and rays to researcher of SEAFDEC MCs, the training course was specifically designed for determining age of sharks and ray for formulating growth rates. There were nineteen (19) participants from eight (8) SEAFDEC Member Countries, namely: Cambodia, Indonesia, Japan,

Planned activity	Expected outcome/output	Achievements
	on vertebra method Strengthening the skill of key-in data and data report for SEAFDEC regional sharks and rays database	Malaysia, Myanmar, Philippines, Thailand, and Viet Nam. With regarding to training course, participant could apply his/her new knowledge to attain the more reliable assess stock model. Three participating countries for sharks and rays data collection initiated store shark and ray data to SEAFDEC regional sharks and rays database. It would be share as reference data for regional fisheries management in future.
Activity 2		
Sub-activity 2.1	Set/Verified data collection of shark landing at the selected sites in participating countries	Set of one-year data collection in Indonesia, Malaysia and Thailand from July 2019 - June 2020. Taxonomic information of sharks and rays caught in Indonesia, Malaysia and Thailand was validated and updated. This data will be a part to assess stock status for sharks and rays for both demersal and pelagic species which is valuable information for developing shark and ray fishery management plan.
Activity 3		
Sub-activity 3.1	Dissemination of sharks and rays information to SEAFDEC MCs	SEAFDEC researchers transferred shark and ray information and knowledge to the Southeast Asian countries and also print and disseminate SOP of shark data collection.
Sub-activity 3.2 (if any)		

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
National report sharks and rays data collection in Tawau, Malaysia	Hard copy	
National report sharks and rays data collection in Cilacap, Indonesia	Hard copy	
National report sharks and rays data collection in Songkhla, Thailand	Hard copy	
Training report for Age Determination Using Vertebra for Sharks and Rays	Hard copy	
Standard Operating Procedure Volume 2.		

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1	Age determination using hart part annual rig of shark and ray is the most accurate method to make growth curve. Participant could attain the more reliable YPR model, which was trained in year 2018.They also strengthen a network of stock assessment scientists in the Southeast Asian region. SEAFDEC regional shark and ray database was improved based on recommend of participants, local enumerators. Local enumerators could key-in and use the database. Participant appreciated this database platform that could reduce amount of time for managing data and also could analyze data in a variety of ways.

Activity 2	
Sub-activity 2.1	With support from the project, twelve (12) months of sharks and rays data from July 2018 to June 2019 have been systematically and correctly recorded and national report of sharks and rays data collection will be published. This information could be conveyed to policy maker in order to develop NPOA and/or fisheries management in advance.

6. Major Impacts/Issues

One of the objectives of supporting shark and ray data collections in MCs is to build national capacities for assessing the stock status of sharks and rays in the Southeast Asian region by using appropriate model. However, the existing data of sharks and rays are still insufficient to achieve the objective with appropriate model. To assess the stock of sharks and rays, it is required to collect data for three years at least. SEAFDEC already supported data collections in Indonesia, Malaysia and Thailand for 2 year continuously. In this connection, supporting shark and ray data collections should be continued for one more year.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

The achievements for this Project were to build national capacities of MCs to collect and utilize shark and ray data as well as support MCs for formulating a National Plan of Action (NPOA) and NDF document for sustainable fisheries in the Southeast Asia region.

MCs could identify sharks and rays at species level and also systematically collect their own shark and ray data. Currently, shark and ray data at species is available in six (6) participating countries; namely, Cambodia, Indonesia, Malaysia, Myanmar, Thailand and Viet Nam (note: Brunei did not participate in the project due to the regulations which shark fishing is prohibited. Lao PDR and Singapore did not participate due to a limited landing of sharks and rays in their countries. Philippine did not participate due to no proper landing site available for the project activities). The data collected during the project implementation period (1995-1996) was used to determine appropriate model (*i.e.* Yield Per Recruit (YPR) model) to assess the stock and fishery status of sharks and rays in the Southeast Asian region. Researchers of MCs were trained for using the YPR model.

Under the Project, SEAFDEC/TD developed a data management platform; namely SEAFDEC Regional Sharks and Rays Database in order to store and share data for fisheries management at regional level. SEAFDEC Researchers would further share their knowledge and experience in the formulation process of Shark NPOA in MCs. During the project period, the Department of Fisheries Thailand successfully developed their first draft of Shark NPOA for Thailand.

2. Implemented Activities/Sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1	
Sub-activity 1.1	<p>During year 2013-2014, project activities have focused on building capacity of enumerator regarding to data collection technique and identification for sharks and rays at the species level by organize regional meeting and training course.</p> <p>In year 2013, technical meeting on sharks and rays data collection in Asian was organized to understand issue and ongoing activity of shark and rays data collection in each SEAFDEC MCs as well as brainstorm for priorities need activity to improve data collection in Asian region.</p> <p>In year 2014. Organize regional training workshop to improve capacity of species identification to ASEAN Member Countries. The aim of the training was training to trainer, who could able to pass knowledge from</p>

List of Activities	Description of Implemented Activities
	<p>workshops to their local shark landing enumerator.</p> <p>During year 2018-19, capacities building to utilize sharks and rays data for providing scientific information, particularly resource and fisheries status assessment have been conducted. Two training courses were organized, namely and Stock Assessment for Shark and Rays Using Yield Per Recruit Model and Age Determination Using Vertebra for Sharks and Rays.</p> <p>Training Course on Stock Assessment for Shark and Rays Using Yield Per Recruit Model was organized in year 2018. The aim of training is capacity building SEAFDEC MCs to be able to utilize data for fisheries management.</p> <p>Additionally, SEAFDEC focused to promote SEAFDEC regional Sharks and Rays Database. Regional and on-site training course on Key-in Data and Data Report for SEAFDEC Regional Shark and Ray Database was organized in year 2018. The training course was designed to local enumerator for learning on key-in data and to national coordinator for shark project to learn data report usage.</p> <p>Age Determination Using Vertebra for Sharks and Rays was organized in year 2019. The aim of training is to enhance human resource development on age determination for formulating grow rates of sharks and rays in order to attain the more reliable YPR model.</p>
Activity 2	
Sub-activity 2.1	<p>In year 2015 Regional Technical Meeting on Sharks and Rays Data Collection and Project Planning Year 2015-2016 was organized in order to select pilot landing site, term of agreement and plan of activities for collect sharks and rays data.</p> <p>In year 2015-2016, With financial support from the Government of Japan (through the SEAFDEC Secretariat and MFRDMD) and the European Union (EU) through the CITES Secretariat, the SEAFDEC-EU Regional Project on Sharks and Rays Data Collection was implemented in six (6) ASEAN Member States, namely: Cambodia, Indonesia, Malaysia, Myanmar, Thailand, and Viet Nam.</p> <p>In year 2017 with financial support from the Government of Japan, Data collection in Cambodia was supported.</p> <p>In year 2018-2019 with financial support from the Government of Japan, data collection of sharks and rays at Indonesia, Malaysia and Thailand were supported. The aim to support series of data collection in Asian countries are as following,</p> <ul style="list-style-type: none"> - Increase Data set of data sharks and rays at species level to be long-term condition which was adequate for fisheries management - Up to date and verification of sharks and rays data in pilot site - Improve quality of local enumerator at landing site - Used data to determine appropriate model to assess stock of sharks and rays in Asian region
Sub-activity 2.2 (if any)	<p>Monitoring activities was conducted through organize two meetings namely mid-term project and end project meeting on sharks and rays data collection in year 2016.</p> <p>In year 2017, monitoring was conducted in Cambodia by visiting landing site at Sihanoukville for three (3) times.</p>

List of Activities	Description of Implemented Activities
	<p>In year 2018, monitoring was conducted in Indonesia, Malaysia and Thailand by visiting Cilacap, Tawau and Songkhla fishing port, respectively.</p> <p>Develop SEAFDEC regional sharks and rays database in year 2019. SEAFDEC monitored project progress and validate data through monthly data input into database by local enumerators.</p>
Sub-activity 2.3	Two (2) technical consultation meetings on Shark Stock Assessment and Improvement Data Collection in Southeast Asian Region were organized in year 2017. It aims to facilitate resource persons and stock assessment researcher from the Southeast Asian countries in determining appropriated model for shark stock assessment and also develop work plan for stock assessment training workshop in order to promote mentioned model to SEAFDEC Member Countries.
Activity 3	
Sub-activity 3.1	<p>Published and disseminated guide book on Standard Operating Procedures Sharks, Rays and Skates Data Collection in Southeast Asia Water.</p> <p>Published Handbook for Yield per Recruit model analysis Published National Report on Shark Data Collection in Southeast Asian Countries including Cambodia, Indonesia, Malaysia and Thailand.</p> <p>Participate in process of develop shark NPOA for in SEAFDEC Member Countries, Thailand.</p> <p>Sharing lesson learnt of sharks and rays data collection with EU-CITES through participating in CITES training course as speaker</p>
Sub-activity 3.2 (if any)	

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1	
Sub-activity 1.1	<p>Capacity of SEAFDEC Member Countries to systematically and correctly collect sharks and rays data at species.</p> <p>Capacity of SEAFDEC MCs to utilize data for sustainable fisheries management by converting landing data to be resource and fisheries status using Yield per Recruit assessment model.</p>
Activity 2	
Sub-activity 2.1	<p>Data set at species level of sharks and rays in Asian region is available. Species diversity, biological and catch information of Sharks and rays in Asian region updated.</p> <p>Sufficient data to develop NPOA and study appropriate model for stock assessment.</p>
Sub-activity 2.2	<p>Local enumerator was trained to identify sharks and rays correctly.</p> <p>Data recording method and system at sampling site correctly conducted.</p> <p>Data set of data Sharks and Rays in Asian region was validated.</p> <p>Developed and Promoted SEAFDEC regional sharks and rays database to SEAFDEC MCs, where have regular shark and rays data collection.</p>
Sub-activity 2.2	Determine YPR model as appropriate model to assess sharks and rays in Southeast Asian region based on existing data (By census of Asian Stock assessment expert)

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 3	
Sub-activity 3.1	Published and disseminated guidebook on Standard Operating Procedures Sharks, Rays and Skates Data Collection in Southeast Asia Water.
Sub-activity 3.2 (if any)	<p>Published Handbook for Yield Per Recruit model analysis.</p> <p>Published National Report on sharks and rays data collection in participating countries, which it would support develop of fisheries monument.</p> <p>SEAFDEC researcher transfer sharks and rays information and knowledge to Southeast Asian countries.</p> <p>Shark NOPA was formulated in Thailand.</p>

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

The Asian region has high diversity and stock of sharks and rays. Even though sharks and rays are non-target catch in the fisheries, they play a significant role for Asian fishers, traders and exporters because of their products' high market value. Over the past several decades, regional shark and ray products have declined. Sharks and rays are caught by various types of fishing gear without any appropriate management of the resources for its sustainability due to insufficient data, *e.g.* catch, biological, habitat, etc. SEAFDEC has initiated regional activities to improve data collections for sharks and rays in the Southeast Asian region for aiming MCs to have sufficient shark and ray data to develop fisheries management, particularly a Shark NPOA.

The Project provided significant impacts to MCs by improving their capacities to collect shark and ray data at species level correctly and systematically as well as building their capacities to utilize data for fisheries management. Also, SEAFDEC developed a regional shark and ray data management platform, namely "SEAFDEC Regional Sharks and Rays Database", in order to safely store the data recorded and easily utilized.

However, some countries in Southeast Asia still have not developed a Shark NPOA. One of the reasons is a limit number of enumerators who could identify sharks and rays at species level and a limited number of national researchers who could convert the landing data to the stock information for fisheries management. Further, many shark and ray species have been listed in the CITES Appendix over the past decade. Some CITES-listed shark and ray species are considered as common species and caught regularly during fishing activities in the region, which concerns about livelihood of Asian fishers, traders and exporters. For exporting shark and ray products, it has been requested by MCs for Non-detriment Finding (NDF) document. In this regard, capacity building of MCs' researchers for taxonomy identification, data utilization for fishery management and NDF matters is a challenge in the region.

5. Publications and Others

- Report of the Regional Workshop on Data Collection Methodology for the Assessment of shark stock status
- Report of the Project-End-Meeting on Sharks Data Collection in Southeast Asia
- Report of Technical Meeting on Sharks and Rays Data Collection Planning 2017-2018
-
- Report of the Technical Meeting to Determination Appropriate Model for Shark Stock Assessment in Southeast Asian Region
- Report of the Technical Consultation Meeting on Shark Stock Assessment and Improvement Data Collection in Southeast Asian Region
- Report of the On-site Monitoring and Training on Key-in Data and Usage of SEAFDEC Sharks and Rays Database
- Report of the Training Workshop on Sharks and Rays Stock Assessment by YPR Model
- Report of the Training Course on Age Determination Using Vertebra for Sharks and Rays
- National report sharks and rays data collection in Cambodia, period September 2017-August 2018
- National report sharks and rays data collection in Thailand, period July 2018- June 201

- National report sharks and rays data collection in Indonesia, period July 2018- June 201 (Writing)
- National report sharks and rays data collection in Malaysia, period October 2018- September 2019 (Writing)
- Standard Operating Procedures of Sharks, Rays and Skates Data Collection I Southeast Asian Water
- Handbook for Yield Per Recruit model analysis
- A Technical Manual Sample Preparation for Age Determination of Elasmobranchs (presentation file)
- Fish for the People, Volume 17 Number 2, 2019, Page 10-15 “Paving the Way for the Development of Non-Detriment Finding: Towards Precise species Identification of Shark and Rays in Southeast Asia”

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

		Project ID: 201401008	
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region: <i>Facilitating Fisheries Activity Information Gathering through Introduction of Community-based Resources Management / Co-management</i>		
Program Strategy No.:	I	Total Duration:	2013 - 2019
Lead Department:	Training Department (TD)	Lead Country:	Viet Nam
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 375,616
Project Partner:	None	Budget for 2019:	USD 59,000
Project Leader:	Thanyalak Suasi / TD	Project Participating Country(ies):	ALL Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

The Project was carried out to support the SEAFDEC Member Countries (MCs) by reviewing the issues and constraints on fisheries data collections in coastal small-scale and inland fisheries at national level through the regional workshop. The Project also supported MCs for conducting the onsite training courses on “Facilitating Fisheries Information Gathering Through Introduction of Community-based Resources Management (CBRM)/ Co-management”. The training courses introduced the concepts of CBRM/ Co-management to Provincial Officers of MCs. Further, with support of Fisheries Officers of MCs, the activities on information collections at the pilot sites were monitored, and the information were further analyzed for developing a policy. The Project also facilitated to design coastal and inland fishery management plans through appropriate participatory mechanism of CBRM/ Co-management for the fisherfolk and local communities.

2. Background and Justification

In the Southeast Asian region, it has been recognized that fishery statistics in coastal and inland fisheries are under-reported due to the nature of fisheries as being multi-species and involving large number of small-scale fishers. Therefore, it is necessary to further improve data and information collection systems and introduce the concept and framework of appropriate fisheries management with involving fisherfolk, local communities, local government officers, etc. The status of coastal and inland fisheries could be better understood by analyzing the data and information collected, which could be used as a basis for planning and managing fisheries and fisheries resources.

The ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 “Fish for the People 2020: Adaptation to a Change Environment” held in June 2011 adopted a resolution recommending that: 1) *Adopt co-management at all levels and with all relevant stakeholders in the process of planning and policy formulation for management, conservation and rehabilitation of habitats and protective geographical features, as well as policy formulation on the use and management of natural and human resources to ensure that climate change responses are integrated into fisheries policy frameworks,* 2) *Enhance and promote the participation of local communities, fisheries associations and other stakeholders in fisheries management and co-management. In addition, communities should take part in fisheries and stock assessments by providing data, local ecological knowledge, and status of the stocks.* In line with the above Resolution, a regional project entitled “Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region: *Facilitating fisheries activity information gathering through introduction of Community-based Resources Management / Co-management*” was formulated for the MCs under the Japanese Trust Fund (JTF). Under the Project, the activities were implemented at project pilot sites in selected Member Countries after conducting the on-site training course. It has been recommended that further follow-ups

activities at the project pilot sites are required in order to strengthen the practical CBRM/Co-management in MCs and further expand to the other areas.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: Improve compilation of fisheries and socio-economic information on coastal small-scale and inland fisheries in the Southeast Asia	Outcome 1: (1) Reviewing the problems of fisheries data collection in coastal small-scale and inland fisheries at national (2) identifying the key issues of fisheries data collection (3) Sharing the lessons learned from effective ways of data collection among the SEAFDEC Member Countries	Output 1: Discussing and exchanging information/opinions and cultivating understanding on the way forward for promotion of fisheries information gathering	Activity 1: Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region
Objective 2: Support Member Countries to introduce applicable practice of CBRM/Co-management	Outcome 2: Increased the number of local officers and fishers who cultivate understanding on introducing skills for establishment of CBRM / Co-management	Output 2: (1) Provide knowledge and experience on practical approach on CBRM / Co-management to fisheries officer (2) Practical in competence in planning and implementing the applicable coastal/inland fishery management plans	Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management, including the methodology on gathering fisheries activity information
Objective 3: Facilitate better understanding and knowledge on status and condition of coastal small-scale and inland fisheries at national and local level	Outcome 3: Fisheries management through CBRM / Co-management approach strengthened the information dissemination of results of practical models and survey for Member Country	Output 3: Discussion and Developing practical models of CBRM/Co-management of coastal small-scale and inland fisheries with Member Country	Activity 3: Monitoring and Facilitating 3.1 Monitoring and additional support for Member Countries activities of facilitating CBRM/Co-management and gathering fisheries activity information 3.2 Study (Base-line survey) on appropriate activities sustainable for CBRM/Co-management in fisheries community

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region	Resolution problems and constraints of fisheries data collection in coastal small-scale and inland fisheries from the workshop will be utilized to identify the key issues that should be addressed by the countries. This could be achieved by fostering the lessons learned in terms of the methodologies and exchanging experiences in effective fisheries data collection. It was also envisaged that such effort could be adapted in the setting up of fisheries census with a

Activity	Description
	future goal of improving fisheries data collection.
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information	Training On Trainers (TOTs) courses are conducted in selected countries. The TOTs aim to: 1) Provide clear and detailed concept and methodology on CBRM/Co-management; 2) Cultivation the understanding on tools for data and information collection in coastal and inland fishing communities; and 3) Introducing skills for establishment of organizations in the fishing communities to implement CBRM/Co-management. As well including practical planning and implementing the applicable coastal/inland fishery management plans.
Activity 3: Monitoring and facilitating 3.1 Monitoring and additional support for Member Countries activities of facilitating CBRM/Co-management and gathering fisheries activity information	Member Country will select pilot site which promoted CBRM/Co-management approach, and SEAFDEC will assist fisheries officers of Member Countries in collecting and analyzing information from fisheries community for policy formulation, also in designing coastal and inland fishery management plans through participatory mechanism of CBRM/Co-management approach, that suit the local condition.
3.2 Study (Base-line survey) on appropriate activities sustainable for CBRM/Co-management in fisheries community of Member Country	SEAFDEC assists Member Countries in promoting CBRM/Co-management and building the capacity of the fisheries community

3.3 Activity, Sub-activity and Proposed Budget for 2014-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1: Regional Workshop on improvement of fisheries information collection in coastal small-scale and inland fisheries of the Southeast Asian region	Sub-activity 1.1	18,000	-	-	-	-	20,000	25,500
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM including the methodology on gathering fisheries activity information	Sub-activity 2.1	34,000	70,000	40,000	27,000	-	20,000	-

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 3 Monitoring and facilitating	Sub-activity 3.1: Monitoring and additional support for Member Countries activities of facilitating CBRM/Co- management and gathering fisheries activity information				7,000		40,816	28,700
	Sub-activity 3.2: Study on appropriate activities sustainable for CBRM in fisheries community in Southeast Asia			17,000	6,000	22,800	6,000	4,800
	Sub-Total	52,000	70,000	57,000	40,000	22,800	86,816	59,000

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

There have been many attempts in the SEAFDEC Member Countries to implement a pilot project on CBRM/Co-management. In 2019, the Project conducted the follow-up activities in three (3) pilot sites in Nam Xouang Reservoir, Vientiane, and Khammouane Province, Lao PDR, and Nam Oon Dam, Sakon Nakhon Province, Thailand. The local Fisheries Officers were strengthening their own capacities in CBRM/Co-management through conducting the project activities at the pilot site. The extension media materials (e.g. posters and brochures) were developed and distributed to local fisherfolk, local communities, etc. in order to build their awareness on conserving and managing fisheries resources in their areas, as well as strengthening surveillance activity in the areas. Further, alternative livelihood program was introduced to the local communities to generate additional incomes for their better life and reduce fishing effort for conserving and managing fisheries resources. And, the results of data collections were reported back to the local communities.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1: Regional Workshop on Facilitating fisheries activity information gathering through introduction of CBRM/Co-management in the Southeast Asian	IV. Policy	12	15 IFRDMD 1	FRA (1)	25,500
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information	II. Training	-	-	-	No activity in 2019

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 3: Monitoring and facilitating 3.1.1 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR 17-23 March 2019	I. Research	462 (147)	2		5,511.7
23- 26 July 2019		50 (15)	3, IFRDMD 7		3,676.1
23-26 September 2019		30	2		6,500
3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR 29 April- 4 May 2019	I. Research	22 (4)	1	-	4,725.7
2-4 September 2019		29 (8)	2	-	5,500
3.2.1 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand	I. Research				
4-7 March 2019		21 (11)	4	-	1,750.9
21-24 May 2019		141 (34)	3	Hokkaido University (1) Rajamangala University (2)	1,815.8

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1: Regional Workshop on Facilitating fisheries activity information gathering through introduction of CBRM/Co-management in the Southeast Asia	The key factor for successful of promotion CBRM/Co-management were identified and the lesson learned from case study will be shared further apply among Member Countries	The Regional Workshop will be organized on 22-24 October 2019 at Sakon Nakhon Province to review the project implementation and to share the lesson learned among Member Countries.
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information	The Fisheries officers of Member Countries gain knowledge and better understand in CBRM/Co-management concept and further apply in their work	None of activities implemented in year 2019.
Activity 3: Monitoring and facilitating 3.1.1 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR	Fisheries Management through CBRM/Co-management approach would be strengthened and further develop the appropriate model of CBRM/Co-management for the Southeast Asian Region	The fishers, local people and local fishery officers were built capacity on fisheries co-management, the extension media material such as posters and brochures were distributed to fishers for more clearly understand and raise awareness on the importance of fisheries co-management and the fisheries rules and regulations in Nam Xouang

Planned activity	Expected outcome/output	Achievements
		<p>Reservoir, as well as the capacity building of the MCS by fishers' participation was introduced to the Fisheries Management Committee (FMC) including patrolling boats with engine were provided to the patrolling team. Furthermore, the IFRDMD presented them on the result of fish stock and the MSY of the important species. In order to promote the sustainable development in the reservoir, human well-being dimensions (improving fishers' livelihood) are also very important. The study trip was conducted for the fishers and local officers from Nam Xouang reservoir to learn and exchange the experiences with the success case studies on fishery resources management including strengthening fisher's livelihood.</p>
<p>3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR</p>		<p>The human well-being is recognized that the important component for sustainable development. In order to enhance alternative livelihood, the Aquaculture Group was established under Fisheries Management Committee (FMC) of Banmai Namprakan village. The training course on fish aquaculture technique was organized at the project site attending by 12 aquaculture group members and 10 community members (M:18, F:4) with inviting the resource person from Nam Xouang Aquaculture Center, Vientiane, Lao PDR to provide knowledge on catfish culturing and conduct trial catfish culturing which divided into two (2) type of culturing 1) cement pond 2x3x1.2 meter and 2) Concrete Pipe size 1x0.4 meter. Moreover, the community members can learn and gain experience with involving in trial cases of the aquaculture activity, the knowledge of fish aquaculture technique could be transferred to the neighbor village that will support their livelihood. The data collection on fish catch was conducted in the project site with collaboration work between local officers and community finished in June 2019, the data will be summarized and report back to the community.</p>
<p>3.2.1 Monitoring and facilitating CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand</p>		<p>The local meeting was organized at the communities around Nam Oon Dam to review the project activities and report the result of data collection by logbook and stock assessment research, as well as to make understand on fisheries rule and regulation on closing season, the type of fishing gear prohibit to use in Nam Oon</p>

Planned activity	Expected outcome/output	Achievements
		Reservoir. Moreover, the Professor from Rajamangala University of Technology Isan Sakhon Nakhon Campus also participate to present the research result on the diversity of fish juvenile in Nam Oon Dam, this scientific result could be supporting the information for defining the fisheries management measures.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
1. Report on Monitoring and Facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR, 17-23 March 2019, 23-26 July 2019, and 23-26 September 2019	Hard copy and PDF	
2. Posters and hand fan for increasing knowledge on fisheries rules and regulations in Nam Xouang reservoir	Posters 100 Hand fan 500	
3. Presentation on Status of Fisheries Resources in Nam Oon Dam Sakon Nakhon, Thailand	PDF	
4. Presentation on Result of catching data from logbook of Nam Oon Dam Sakon Nakhon, Thailand	PDF	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1: Regional Seminar on Improvement CBRM/Co-Management approach in Coastal small-scale and Inland Fisheries of the Southeast Asian Region	-
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information	-
Activity 3: Monitoring and Facilitating Sub-activity 3.1: Monitoring and additional support for Member Countries activities of facilitating CBRM/Co-management and gathering fisheries activity information Sub-activity 3.2: Study on appropriate activities sustainable for CBRM in fisheries community in Southeast Asia.	- -

6. Major Impacts/Issues

Human well-being dimensions (improving fishers' livelihood) are also very important and should be promoted for the fishers and local officers in the respective area.

The local people were encouraged to conduct the group activities such as fish processing activity; they found the difficulties on the management system that quite difference from the individual work.

The participation of community members is the important factor to implement the Community-based Resources Management/Co-management project. It might take time to provide knowledge and introduce them for better understanding on sustainable fisheries resources management. Therefore, the project should be implemented for long term that could contribute to the effective outcome.

The scientific data and research work are necessary as basis to support to define the fisheries management measures. It would be useful when conducting the research activity in the project area.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

The Project carried out to support the SEAFDEC Member Countries (MCs) by discussing and exchanging information/ opinions and the way forward for promoting the effective way of fisheries information gathering in coastal small-scale and inland fisheries through the Regional Workshop. The project supported MCs through the activities on on-site training “Facilitating Fisheries Information Gathering Through Introduction of CBRM/Co-management” in order to strengthen the capacity of Fisheries Officers in MCs. Moreover, the Project provided additional support to Fisheries Officers in the implementation the project activities in the pilot sites of Cambodia, Lao PDR and Thailand, to introduce CBRM/ Co-management, as well as to design fishery management plans under appropriate participatory mechanism of CBRM/Co-management.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1: Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region	The Regional Workshop have conducted for two (2) times at the first and last year of project. The Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region was held in January 2013 to review the problems of fisheries data collection in coastal and inland small-scale fisheries including identify the issues and difficulties of fisheries data collection, as well as the effective ways of data collection were discussed in the Regional. However, the project will complete in December 2019, the Regional Workshop on “Facilitating fisheries activity information gathering through introduction of CBRM/ Co-management in the Southeast Asia” will organize in October 2019 to review the project implementation and to share the lesson learned among Member Countries.
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information	Training on Trainers (TOTs) courses were conducted in Member Countries of Cambodia, Lao PDR, Malaysia, the Philippines, Thailand and Viet Nam from 2013-2016. The training course aim to introduce the appropriate participatory mechanism of Co-management/ Community-based resources management including the methodology on gathering fisheries activity information including practical planning and implementing the applicable coastal/ inland fishery management plans.
Activity 3: Monitoring and facilitating 3.1 Monitoring and additional support for Member Countries activities of facilitating CBRM/Co-management and gathering fisheries activity information	The pilot sites were selected in three (3) Member Countries namely; Cambodia, Lao PDR and Thailand to promote CBRM/Co-management approach, SEAFDEC has assisted fisheries officers of Member Countries in conducting the project activities in collecting and analyzing information from fisheries community for policy formulation, also in designing coastal and inland fishery management plans through participatory mechanism of CBRM/ Co-management approach, that suit the local condition.
3.2 Study (Base-line survey) on appropriate activities sustainable for CBRM/Co-management in fisheries community of Member Country.	SEAFDEC in collaboration with the Department of Fisheries, Thailand, selected Nam Oon Dam, Sakon Nakhon Province as the pilot site to implement the CBRM/ Co-management and building the capacity of the fisheries community with various activities such as baseline survey, build awareness on fisheries management, local workshop on define the fisheries management measures, monitor the fisheries resources through participatory mechanism.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1: Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region	In 2013, the Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region, discussed and exchanged information/opinions and adopts on the way forward for promoting the effective way of fisheries information gathering in coastal small-scale and inland fisheries .For year 2019, the second Regional Workshop on “Facilitating fisheries activity information gathering through introduction of CBRM/ Co-management in the Southeast Asia” the case studies on data collection through CBRM/Co-management will be shared among Member Countries that could be further apply to their own Countries.
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information	The fisheries officers of Member Countries in Cambodia, Lao PDR, Malaysia, the Philippines, Thailand and Viet Nam were strengthened the capacity development on CBRM/Co-management including the methodology on gathering fisheries activity information, they could clear understanding on the concept and transfer the knowledge to the local fisheries officers and local communities, then they could apply the knowledge to encourage the communities in fisheries management process.
Activity 3: Monitoring and facilitating	The monitoring and facilitating have conducted in pilot sites namely: 1) Cambodia (Chong Khneas Commune, Siem Reap) 2) Lao PDR (Nam Xouang reservoir and Khammouane Province) 3) Thailand (Nam Oon Dam, Sakon Nakhon Province)
3.1.1 Monitoring and evaluation CBRM/Co-Management Project in Chong Khaneas, Siem Reap, Cambodia	SEAFDEC follow up the activities of the Communities Fisheries (CFi) Implementing Plan with CBRM/Co-management approach by providing technical support to Community Fisheries of Chong Khneas commune especially the management of conservation zone and promote eco-tourism activity. In addition, Communities Fisheries members gained knowledge and practice to construct the fiber glass boat through the training course providing by SEAFDEC.
3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR	The Fisheries Management Committee (FMC) were established in Naxythong and Phone Hong District which located in the upper and lower of Nam Xouang Reservoir. The fisheries rules and regulations of Nam Xouang reservoir had been completed and accepted by the FMC members and announced with the sign boards, as well as the buoys installation was conducted for conservation zone demarcation, after that strengthening the surveillance activity. In order to enhance the fisheries resources, the training course on mobile hatchery system was introduced to the fishers around Nam Xouang reservoir. The fishers were built capacity on the management system of reservoir through study trip activity and SEAFDEC produced extension material such as poster and brochures to raise awareness on fisheries resources management. In addition, SEAFDEC/IFRDMD has collaborate work on the study of stock assessment and MSY of important species in Nam Xouang Reservoir.

List of Activities	Achievements and Outcomes/Outputs of Activities
3.1.3 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR	The Fisheries Management Committee (FMC) and conservation zone was established at Banmai Namprakan Village, a pilot site in Khammouane Province. The sign board on the regulation and conservation area mapping was installed at Conservation area of Namprakan River as well as the Patrolling Unit was established to conduct the surveillance activity. FMC members gained knowledge and experience on the Fisheries Management system from study tour to Bolikhamsai province. The fish releasing activity was conducted at conservation area of Banmai Namprakan River during National fish releasing day to enhance awareness of community members for fisheries resources conservation. The project has promoted the alternative livelihood program by introducing fish processing technique and fish aquaculture technique to the Community members that they gained knowledge and experience to operate business under group management. However, the statistic and fish market survey were conducted to collect fisheries data as supporting information to develop the fisheries management plan and other framework.
3.2.1 Monitoring and facilitating CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand	SEAFDEC and Department of Fisheries Thailand selected Nam Oon Dam, Sakon Nakhon Province to be a pilot site. The baseline survey was conducted to understand the condition of area, then the fishers around Nam Oon Dam were enhanced knowledge through the training course on CBRM/Co-management. The local workshop was organized to define the appropriate fisheries management measures for Nam Oon reservoir with participatory approach and the common fisheries rule and regulation were announced with the installation of sign board and clearly define the conservation area by installation buoys for demarcated zone. The monitoring of fisheries resources activity involved by 32 voluntary fishers collect data with recording their catch data into logbook. In addition, the stock assessment research was conduct by using enumerator collect the catch data and send data to SEAFDEC/TD for analysis, then the research on “Yield per Recruit Analysis for White Eyes Barb Fishery in Nam Oon Reservoir” was presented to the communities as well as the result of catching data. However, the local fisheries officers have plan to expand the Nam Oon model to implement in the other area.

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

1. The project pilot site selection is not covering the coastal area. It has site only in inland fisheries, namely; Cambodia, Lao PDR and Thailand.
2. The participation of community members is the important factor to implement the CBRM/Co-management project. It might take time to provide knowledge and introduce them for better understanding on sustainable fisheries resources management. Therefore, the project should be implemented for long term that could contribute to the effective outcome.
3. The scientific data and research work are necessary as basis to support to define the fisheries management measures. It would be useful when conducting the research activity in the project area.
4. When implementing the project activities with the local people, we need to consider the people culture in each area. Because the participation from people also is depended on their culture.
5. The project activities are very useful for the fishers, they are appreciated the project even some activities cannot be implemented because of limited budget and time.

5. Publications and Others

- Fish for the People, Volume 15 Number 3, 2017, Page 27-29 “Promotion Community-based Resources Management: a Case Study in Nam Oon Dam, Sakon Nakhon Province, Thailand”
- “Yield per Recruit Analysis for White Eyes Barb Fishery in Nam Oon Reservoir” (presentation file)
- Species Diversity of Commercial Fishes From Ban Mai, Nam Pakan, Khammoune Province, Lao PDR (technical report)

PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2019

			Project ID: 2013040102
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region		
Program Strategy No.:	I	Total Duration:	2013 - 2019
Lead Department:	Marine Fishery Resources Development and Management Department (MFRDMD)	Lead Country:	Philippines
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 316,065
Project Partner:	Training Department (TD) and Secretariat (SEC)	Budget for 2019:	USD 33,180
Project Leader:	Raja Bidin bin Raja Hassan until February 2017 Mohammad Faisal bin Md Saleh since March 2017	Project Participating Country(ies):	Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam

PART I: OVERALL PROJECT DESCRIPTION
1. Brief Project Description

The Project involves the compilation and comparison of annual and/or monthly CPUE where data are available for the last three decades in the region, the comparison of purse seine fisheries management systems/measures including TAC systems and other management measures in the world, the genetic study of a commercially important pelagic species, and the development of management strategies for sustainable purse seine fisheries in the Southeast Asian region. Since catch-effort statistics are available in Malaysia and Thailand and CPUE is an indirect measurement of abundance of a target species in fisheries, MFRDMD makes its first attempt to examine the trend of resource level using CPUE for the last three decades.

MFRDMD also reviews and compares purse seine fishery management systems including TAC systems and other management measures in the world to examine which management system/measures is applicable for the management of small pelagic fishery in the region. Moreover, the genetic study intends to verify the extent of the connectivity of commercially-important pelagic species targeted by purse seine fisheries, and provide with scientific background for concerted management actions of SEAFDEC Member Countries (MCs) for shared stocks of small pelagic species. By the end of the project, MFRDMD could review available information including stock levels, and MFRDMD in cooperation with MCs could examine management strategies for sustainable purse seine fisheries in the region.

2. Background and Justification

Small pelagic fishes such as Indian mackerels, scads and sardinellas are very important in the Southeast Asian region. In 2010, more than 800,000 MT of *Rastrelliger* spp., 700,000 MT of *Decapterus* spp. and 800,000 MT of *Sardinella* spp. were captured in the region. Besides food resources, capture fisheries targeting these fishes are of fundamental importance to this region in terms of employment and livelihood of fishers. Purse seine is one of the major fishing gears to catch those small pelagic fishes. However, the management of purse seine fisheries is still neglected because adequate information of stocks and biological characteristics are lacking. For the sustainable use of these resources, the formulation of a management plan is required. Therefore, we need to develop appropriate way to assess the size and status of the stocks for the accurate TAC allocations and to find the most applicable TAC system for the purse seine fisheries in the region. Considering the likeliness of these stocks shared by the countries bordering with the same ecosystems both in the Andaman Sea and the South China Sea, the effective management of shared stocks requires management measures to be taken for the whole coverage area beyond national waters.

The Project corresponds to #10 of Resolution at the ASEAN-SEAFDEC Conference in 2011 (Strengthen knowledge/science-based development and management of fisheries through enhancing the national capacity in the collection and sharing of fisheries data and information) and #22 of Plan of Action (Establish and strengthen regional and sub-regional coordination on fisheries management and efforts to combat IUU fishing including the development of regional/sub-regional Monitoring, Control and Surveillance (MCS) networks). Considering the importance of the Project in comparative studies for the management of purse seine fisheries, especially having several options for the management strategy of purse seine fisheries in the region, SEAFDEC proposed to expand its project period to 2019.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To compile and compare annual and/or monthly catch per unit effort (CPUE) data for the last three decades in Malaysia and Thailand where historical catch-effort statistics had been collected by SEAFDEC and to interpret the trend of resources in the region	Outcome 1: Purse seine CPUE data in Malaysia and Thailand are utilized to interpret the trend of resources in the region	Output 1: Purse seine CPUE data in Malaysia and Thailand are compiled	Activity 1: Comparative Studies for CPUE and TAC 1.1 Case studies for CPUE in the Southeast Asian region
Objective 2: To assess which unit of effort is most appropriate for Malaysia, Thailand, and other Member Countries and to examine other indicators for stock assessment	Outcome 2: Suitable indicators for purse seine management in the region are examined	Output 2: Purse seine CPUE and other indicators in Member Countries are compared and assessed	Activity 1: Comparative Studies for CPUE and TAC 1.2 Suitable CPUE and other indicators for resource levels in Member Countries

Objective	Outcomes	Outputs	Activities
Objective 3: To compare existing management systems/measures of purse seine fishery including total allowable catch (TAC) systems in the world to examine which management system/measure is applicable for management of purse seine fishery in the region	Outcome 3: Understanding of TAC systems and the other management measures for purse seine in the region is improved.	Output 3: TAC systems and the other management measures in the world for purse seine are compared	Activity 1: Comparative Studies for CPUE and TAC 1.3 Comparison of TAC systems in the world (including other management measures)
Objective 4: To compare genetic structures of commercially important small pelagic species in the region by studying one species of the commercially important sardines	Outcome 4: Understanding of fish stock structures in the region is improved	Output 4: New genetic data on a pelagic fish species is compiled and analyzed	Activity 2. Genetic Data Collection and Analysis 2.1 Equipment preparation for genetic study 2.2 Sample collection 2.3 Genetic study 2.4 Data compilation and analysis
Objective 5: To propose management strategies for sustainable purse seine fisheries in the Southeast Asian region based on available data	Outcome 5: Management strategies for sustainable purse seine fisheries in the region based on available data are improved.	Output 5: Core Expert Meeting/Workshop is held for effective program implementation	Activity 3. Meetings for Effective Program Implementation 3.1 Core Expert Meeting/Workshop
		Output 6: Recommendation for management of purse seine fisheries in the region is reported.	Activity 4. Recommendation for Purse Seine Fisheries Management in the Southeast Asian region 4.1 Recommendation for fisheries Management 4.2 Preparation and publishing of terminal report

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Comparative Studies for CPUE and TAC	As a case study, annual and/or monthly catch per unit effort (CPUE) data will be compiled for the last three decades in Malaysia and Thailand where historical catch-effort statistics had been collected by SEAFDEC. These data will be compared and utilized to interpret the trend of pelagic resources in the region. By using the compiled CPUE data and the other indicators, the most appropriate indicators to assess resource levels for purse seine fishery in the region will be examined. Existing management systems/measures in the world for purse seine fishery including total allowable catch (TAC) systems will be compared to examine which management system/measure is applicable for management of purse seine fishery in the region.
Activity 2 Genetic Data Collection and Analysis	Genetic structures of commercially important small pelagic species targeted by purse seine fishery in the region will be studied. One species of the commercially important sardines will be selected. New genetic data on a pelagic fish species is compiled and analyzed to consider appropriate management of purse seine fishery in the region.

Activity	Description
Activity 3 Meetings for Effective Program Implementation	Core Expert Meetings will be held for effective program implementation. The meetings which are planned in 2014, 2016, 2017, and 2018 will discuss on the planning and progress of Activities 1-2 and draft recommendations for sustainable purse seine fisheries in the Southeast Asian region based on available data.
Activity 4 Recommendation for Purse Seine Fisheries Management in the Southeast Asian region	By using the information obtained in Activities 1-3, a terminal report will be published and recommendation will be made available for sustainable purse seine fisheries in the Southeast Asian region based on available information.

3.3 Activity, Sub-activity and Proposed Budget for 2015-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1: Comparative Studies for CPUE and TAC	Sub-activity 1.1 Case studies for CPUE in the Southeast Asian region	20,000	5,000					
	Sub-activity 1.2 Suitable CPUE and other indicators for resource levels in Member Countries			10,000	6,500			
	Sub-activity 1.3 Comparison of TAC systems in the world (including other management measures)	25,000	5,000	10,000	6,500	7,933	8,908	
Activity 2: Genetic Data Collection and Analysis	Sub-activity 2.1: Equipment preparation for genetic study	15,000						
	Sub-activity 2.2: Sample collection		8,000	5,000				
	Sub-activity 2.3: Genetic study		9,866	15,972	9,773			
	Sub-activity 2.4: Data compilation and analysis					5,000	9,825	
Activity 3: Meetings for Effective Program Implementation	Sub-activity 3.1: Core Expert Meeting/Workshop		30,394		25,000	21,000	23,214	
Activity 4 Recommendation for Purse Seine Fisheries Management in the Southeast Asian region	Sub-activity 4.1: Recommendation for fisheries Management							24,520
	Sub-activity 4.2: Preparation and publishing of terminal report							8,660
	Sub-Total Budget	60,000	58,260	40,972	47,773	33,933	41,947	33,180

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

MFRDMD continuously analyzed and updated information on purse seine fisheries from MCs as well as examined the data for a regional synthesis of purse seine fisheries to suggest possible suitable stock indicator and management systems in MCs. MFRDMD conducted the Internal Workshop under the project in Kota Bharu, Kelantan, Malaysia from 12 to 14 February 2019. The workshop aimed to enhance the knowledge regarding the fisheries management, and agreed to publish a terminal report of the Japanese Trust Fund (JTF) VI Project by the end of 2019. The workshop also discussed on the direction for the next project under the JTF VI Phase 2.

Report of the 4th CEM (2018) was published in May 2019. In addition, Hokkaido University in Japan in collaboration with MFRDMD will publish a scientific paper in an international journal regarding the purse seine fishery in the East Coast of Peninsular Malaysia.

In addition, the preparation of genetic component as complement to the project terminal report was also completed. At the end of 2019, MFRDMD will publish a regional project terminal report entitled “Comparative Studies for Purse Seine Fisheries in the Southeast Asian Region” as the last activity of the project. The terminal report consists of two major components which are comparative and genetic population studies.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 4					
Sub-activity 4.1: Recommendation for fisheries management	Workshop		8 (2)	2 (1)	24,520
Sub-activity 4.2: Preparation and publishing of terminal report	Information		All Editorial Team		8,660

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 4		
Sub-activity 4.1: Recommendation for fisheries Management	Comparison of TAC systems and management measures for purse seine fishery	<p>MFRDMD had conducted the Internal Workshop for this project in Kota Bharu, Kelantan, Malaysia from 12 to 14 February 2019. This workshop aimed to enhance the knowledge regarding the fisheries management. The workshop agreed to publish the terminal report of the JTFVI project by the end of 2019. The workshop also discussed on the direction for the next project, the JTFVI Phase Two.</p> <p>The report of the 4th CEM (2018) has been published in May 2019. In addition, Hokkaido University, Japan in collaboration with MFRDMD will published a scientific paper in targeted international journal on species composition of purse seine fisheries along the East Coast of Peninsular Malaysia.</p>

Planned activity	Expected outcome/output	Achievements
Sub-activity 4.2: Preparation and publishing of terminal report		At the end of this year, MFRDMD will published a regional project terminal report entitled “Comparative Studies for Purse Seine Fisheries in the Southeast Asian Region” as the end activity of this project.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
1) Meeting report for “The 4 th Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. (SEAFDEC/MFRDMD, 2019).	Pdf, Print	Yes
2) Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. 2019. Overview of Project. Power point presented at the Internal Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 February 2019 in Kota Bharu, Malaysia.	Pdf	Yes
3) Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. 2019. Outline of Regional Synthesis report. Power point presented at the Internal Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 February 2019 in Kota Bharu, Malaysia.	Pdf	Yes
4) Noorul Azliana Jamaluddin, Wahidah Mohd Arshaad, Lawoue’ Sebastien & Noor Adelyna Mohd Akib. A preliminary study of population genetic structure of spotted sardinella, <i>Amblygaster sirm</i> in Malaysian waters. Paper to be presented at International Fisheries Symposium 2019 (IFS 2019) on 18-21 November 2019 in Kuala Lumpur, Malaysia.	Pdf, Print	Yes

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 4	N/A

6. Major Impacts/Issues

Full regional analysis had been influenced by data reliability and validity. Therefore, additional time was needed to complete the preparation and publication of the terminal report.

For genetic study of *Amblygaster sirm*, no samples from Myanmar were acquired. Samples from Myanmar is very important in order to get a better picture of population structure of spotted sardinella around Andaman Sea.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

The Project successfully compiled the landing data from purse seine fisheries from eight MCs for two decades from 1996 to 2015 where historical catch-effort statistical data were available. The CPUE per trip was chosen as the most suitable unit of effort to be used for the stock assessment. The TAC system was

found not suitable and, other management measures *i.e.* Feedback Control and Production Model were decided being more appropriate to be used as management measures for purse seine fishery in the Southeast Asian region. Genetic study of one commercially important sardine found that *Amblygaster sirm* from Ranong versus the rest of the populations (South China Sea, Java Sea, Celebes Sea and Andaman Sea (southern part) were two genetically highly divergent stocks, thus it was recommended that these stocks should be independently managed. Some management strategies for sustainable purse seine fisheries were offered as scientific advices to the MCs.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1: Comparative Studies for CPUE and TAC	
Sub-activity 1.1 Case studies for CPUE in the Southeast Asian region	The questions for essential information like catch and effort data, species composition, biological information and growth parameters were included into the fundamental template. Next, the templates with official letters were sent to each AMSs within agreed timeframe through mails, e-mails and facsimiles.
Sub-activity 1.2 Suitable CPUE and other indicators for resource levels in Member Countries	Historical data from 1996-2015 from fisheries statistical system were compiled from each AMS. In addition to that, the up-to-date information was also being informed annually by the representatives of AMSs through e-mails and meetings. Compiled historical data were analyzed to generate suitable CPUE indicators.
Sub-activity 1.3 Comparison of TAC systems in the world (including other management measures)	TAC systems and other management measures were examined and compared to find the most applicable measure for purse seine fishery in the SEA region through various meetings, workshops and discussion.
Activity 2: Genetic Data Collection and Analysis	
Sub-activity 2.1: Equipment preparation for genetic study	Necessary chemicals, disposable laboratory consumables, DNA extraction kit, Gel-Doc View Machine and PCR machine were purchased for genetic analysis.
Sub-activity 2.2: Sample collection	<i>Amblygaster sirm</i> was selected as a target species for genetic population structure study. The collection of tissue samples was done by the technical officers of the respective countries following strictly the same standard operating procedure (SOP) supplied. The SOP included tissue sample collection in the field at identified sampling/landing sites and tissue preservation either in the field or at the laboratory.
Sub-activity 2.3: Genetic study	DNA extraction, PCR analysis, sequencing was done by using two types of mitochondrial DNA markers.
Sub-activity 2.4: Data compilation and analysis	Findings of the analysis were compiled and examined carefully. Consultations with local resource persons were held to discuss the findings of data sequence analysis.
Activity 3: Meetings for Effective Program Implementation	
Sub-activity 3.1: Core Expert Meeting/Workshop	Four CEMs: 1 st CEM: 26-28 August 2014 (Furama, KL) 2 nd CEM: 9-11 August 2016 (Furama, KL) 3 rd CEM: 12-14 September 2017 (Furama, KL) 4 th CEM: 18-19 September 2018 (Melia, KL) Seven workshops: Regional Workshop: 7-8 Mac 2017 (Dorsett, KL) Genetic Workshop: 6-9 August 2018 (Langkawi) 1 st Internal Workshop: 18-20 November 2013 (Sutra Beach Resort) 2 nd Internal Workshop: 25-27 November 2014 (Tok Aman Bali) 3 rd Internal Workshop: 6-7 January 2016 (Tok Bali)

List of Activities	Description of Implemented Activities
	4 th Internal Workshop: 12-14 February 2018 (Dungun) 5 th Internal Workshop: 12-14 February 2019 (Kota Bharu)
Activity 4: Recommendation for Purse Seine Fisheries Management in the Southeast Asian region	
Sub-activity 4.1: Recommendation for fisheries Management	Consultations with resource persons (a regional and a local RPs) were held a few times to come out with scientific recommendations related to the possible management measures for purse seine fishery in the SEA region.
Sub-activity 4.2: Preparation and publishing of terminal report	The editorial team of MFRDMD continuously had discussion in preparation and publication of terminal report. Terminal report will be disseminated to the SEAFDEC Member Countries and Departments, partner agencies and other fisheries-related organizations.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1: Comparative Studies for CPUE and TAC	
Sub-activity 1.1 Case studies for CPUE in the Southeast Asian region	Annual and/or monthly catch per unit effort (CPUE) data was compiled for the last two decades in eight AMSs where historical catch-effort statistics had been successfully collected by MFRDMD. These data were compared and utilized to interpret the trend of pelagic resources in the region.
Sub-activity 1.2 Suitable CPUE and other indicators for resource levels in Member Countries	CPUE by trip was found as the most appropriate indicators in assessing resource levels for purse seine fishery in the region.
Sub-activity 1.3 Comparison of TAC systems in the world (including other management measures)	TAC was found not suitable for the multispecies situation in SEA region. Thus, other strategies for management measure such as Feedback Control and Production Model were found to be more applicable for management of purse seine fishery in the region.
Activity 2: Genetic Data Collection and Analysis	
Sub-activity 2.1: Equipment preparation for genetic study	All the items purchased were necessary to facilitate and expedite the laboratory analysis.
Sub-activity 2.2: Sample collection	Maximum 35 tissue samples (fin clip) of <i>Amblygaster sirm</i> from each location were collected at a total of 13 selected representative sampling sites in the South China Sea and Andaman Sea.
Sub-activity 2.3: Genetic study	Two mitochondrial DNA markers were selected for this study which were Cytochrome b (Cyt b) and Cytochrome C Oxidase Subunit I (COI) to determine the genetic structure of <i>Amblygaster sirm</i> in the SEA region.
Sub-activity 2.4: Data compilation and analysis	Both the DNA markers used in this study revealed two highly genetic divergent stocks; Ranong vs the rest of the populations (South China Sea, Java Sea, Celebes Sea and Andaman Sea (southern part)). It is recommended that these stocks should be independently managed.
Activity 3: Meetings for Effective Program Implementation	
Sub-activity 3.1: Core Expert Meeting/Workshop	Four CEMs and seven workshops have been successfully organized throughout the project duration which discussed on the planning and progress of Activities 1 to 2 and advised some scientific

List of Activities	Achievements and Outcomes/Outputs of Activities
	recommendations for sustainable purse seine fisheries in the Southeast Asian region based on available data.
Activity 4: Recommendation for Purse Seine Fisheries Management in the Southeast Asian region	
Sub-activity 4.1: Recommendation for fisheries Management	Some scientific recommendations such as to improve statistics on purse seine fishery were suggested for sustainable purse seine fisheries in the Southeast Asian region based on the regional analysis.
Sub-activity 4.2: Preparation and publishing of terminal report	By using the information obtained in Activities 1 to 3, a terminal report will be published by the end of 2019.

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

All activities were successfully completed with good cooperation and support from all parties involved. Nevertheless, there were some issues on the reliability of the compiled data because some countries were not able to fulfill all the parameters in timely manner, especially on the number of vessels for fish purse seine and anchovy purse seine. Final analysis was affected because the fishing effort used in calculation of CPUE is the key component of the project. The other issue was since PS fisheries and geopolitics in each MCs differed from others, MCs should manage the purse seine fisheries to fit to their situations accordingly. All MCs should improve their fisheries statistical data system to be more efficient. Thus, detailed catch-effort statistics in the region should be prioritized to uphold accurate information.

For genetic study of *Amblygaster sirm*, there are several difficulties including bureaucratic procedures and legislations in certain MCs to export samples from the countries to MFRDMD, which resulted in uncertainties to the project implementation. Samples for genetic study from some MCs could not be obtained due to misidentification, which revealed some MCs still have difficulties in species identification of small pelagic species. Furthermore, *A. sirm* is not available all year round as it is a seasonal fish resulting in difficulties in sampling at the specific time.

5. Publications and Others

2013

1. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 36th Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 25-29 November 2013 in Penang, Malaysia.

2014

2. Raja Bidin Raja Hassan. Overview of “Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 1st Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 26-28 August 2014 in Kuala Lumpur, Malaysia.”
3. Mohammad Faisal Md Saleh. Outputs Presentation for Andaman Sea. Power point presented at the 1st Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 26-28 August 2014 in Kuala Lumpur, Malaysia.
4. Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. Genetic Study on *Sardinella* spp in Southeast Asia and Other Region. Power point presented at the 1st Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 26-28 August 2014 in Kuala Lumpur, Malaysia.
5. Noorul Azliana Jamaludin & Wahidah Mohd Arshaad. Sampling procedure for the genetic study. Power point presented at the 1st Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 26-28 August 2014 in Kuala Lumpur, Malaysia.
6. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 37th Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 1-3 December 2014 in Ubon Ratchatani, Thailand.

2015

7. Raja Bidin Raja Hassan. "Current Status of Purse Seine Fisheries in the Southeast Asian Region" iv + 76 pp. (SEAFDEC/MFRDMD, 2015).

2016

8. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 38th Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 23-25 December 2015 in Manila, the Philippines.2016
9. Raja Bidin Raja Hassan and Abdul Razak Latun. Purse Seine Fisheries in Southeast Asian Countries: A Regional Synthesis (Fish for The People 14(1): 7-15, 2016).
10. Mohammad Faisal Md Saleh & Raja Bidin Raja Hassan. Regional Synthesis for Current Status of Purse Seine Fisheries in Andaman Sea. Power point presented at the 2nd Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 9-11 August 2016 in Kuala Lumpur, Malaysia.
11. Wahidah Mohd Arshaad. Genetic population of spotted sardinella (*Amblygaster sirm*) in Southeast Asian region. Power point presented at the 2nd Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 9-11 August 2016 in Kuala Lumpur, Malaysia.
12. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 39th Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 28 - 30 November 2016 in Yogyakarta, Indonesia.
13. MFRDMD. Management strategies and measures for purse seine fishery in the South China Sea. Power point presented at the 19th Meeting of Fisheries Consultative Group/ASEAN-SEAFDEC Strategic Partnership (FCG) on 1-2 December 2016 in Yogyakarta, Indonesia.

2017

14. Mohammad Faisal Md Saleh & Husaini Mohd Rani. Overview and Progress of Project. Power point presented at the Regional Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 7-8 March 2017 in Kuala Lumpur, Malaysia.
15. Wahidah Mohd Arshaad & Adam Luke Pugas. Genetic Study of *Amblygaster sirm*: The Progress. Power point presented at the Regional Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 7-8 March 2017 in Kuala Lumpur, Malaysia.
16. Meeting report for "The Second Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region". (SEAFDEC/MFRDMD, 2017).
17. MFRDMD. Pelagic species in the Southeast Asian region. Power point presented at the Regional Technical Consultation on Fishery Statistics and Information in Southeast Asia (RTC) on 15-18 August 2017 in Bangkok, Thailand.
18. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. Overview and Progress of Project. Power point presented at the 3rd Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 September 2017 in Kuala Lumpur, Malaysia.
19. Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. Genetic Study of *Amblygaster sirm* inferred by Mitochondrial DNA Cytochrome b in South China Sea and Andaman Sea. Power point presented at the 3rd Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 September 2017 in Kuala Lumpur, Malaysia.
20. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 40th Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 27-29 November 2017 in Bangkok, Thailand.
21. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 20th Meeting of Fisheries Consultative Group/ASEAN-SEAFDEC Strategic Partnership (FCG) on 30 November - 1 December 2017 in Bangkok, Thailand.
22. Mohammad Faisal Md. Saleh, Wahidah Mohd Arshaad, Raja Bidin Raja Hassan, Noorul Azliana Jamaludin, and Nurul Nadwa Abdul Fatah. Managing Purse Seine Fisheries in the Southeast Asian Region: a joint effort among ASEAN Member States. (Fish for the People 15(3): 14-16, 2017).

2018

23. Meeting report for "The 3rd Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. (SEAFDEC/MFRDMD, 2018).

24. Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. Genetic Study of *Amblygaster sirm* inferred by Mitochondrial DNA Cytochrome b in South China Sea and Andaman Sea. Paper presented at Internal Workshop in UITM Hotel, Dungun Terengganu, Malaysia on 12-14 February 2018.
25. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. Overview of Project. Power point presented at the 4th Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 18-19 September 2018 in Kuala Lumpur, Malaysia.
26. Mohammad Faisal Md Saleh, Nurul Nadwa Abdul Fatah & Kenji Taki. Output based on regional synthesis. 2018. Power point presented at the 4th Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 18-19 September 2018 in Kuala Lumpur, Malaysia.
27. Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. Population Structure of *Amblygaster sirm* in Southeast Asian Region. Paper presented at the 4th Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 18-19 September 2018 in Kuala Lumpur, Malaysia.
28. Mohammad Faisal Md Saleh, Nurul Nadwa Abdul Fatah & Kenji Taki. Power point presented at the 41st Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 5-7 November 2018 in Langkawi, Kedah, Malaysia.
29. Poster entitled 'Comparative Studies for the Management of the Purse Seine Fish.in SEA region' by Mohammad-Faisal, M. S., Wahidah, M. A., Raja-Bidin, R. H., Abdul-Fatah N.N. and Taki, K.
30. Poster entitled 'The Major Pelagic Species Caught by Fish Purse Seine in East Coast of Peninsular Malaysia' by Mohammad Faisal Md Saleh, Osman Muda, Norfaizal Azli Mat Nor and Annie Nunis Billy.
31. Poster entitled 'Genetic Study of *Amblygaster sirm* inferred by mitochondrial DNA (mtDNA) in South China Sea and Andaman Sea' by Wahidah M. A., Noorul-Azliana J., Nor Ayuni A., Mohammad-Faisal M. S., Taki K.

2019

32. Meeting report for "The 4th Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. (SEAFDEC/MFRDMD, 2019).
33. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. Overview of Project. Power point presented at the Internal Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 February 2019 in Kota Bharu, Malaysia.
34. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. Outline of Regional Synthesis report. Power point presented at the Internal Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 February 2019 in Kota Bharu, Malaysia.
35. Noorul Azliana Jamaluddin, Wahidah Mohd Arshaad, Lawoue' Sebastien & Noor Adelyna Mohd Akib. A preliminary study of population genetic structure of spotted sardinella, *Amblygaster sirm* in Malaysian waters. Paper to be presented at International Fisheries Symposium 2019 (IFS 2019) on 18-21 November 2019 in Kuala Lumpur, Malaysia.

PROJECT DOCUMENT**ACHIEVEMENTS FOR YEAR 2019**

			Project ID: 201504003
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region		
Program Strategy No.:	I	Total Duration:	2015 - 2019
Lead Department:	Marine Fishery Resources Development and Management Department (MFRDMD)	Lead Country:	Malaysia
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 235,578
Project Partner:	Training Department (TD) and Secretariat (SEC)	Budget for 2019:	USD 43,792
Project Leader:	Ahmad Ali / MFRDMD	Project Participating Country(ies) :	Cambodia, Indonesia, Malaysia, Myanmar, Thailand and Viet Nam

PART I: OVERALL PROJECT DESCRIPTION**1. Brief Project Description**

Recently, on a regional level the pressure to list commercially captured shark and ray species on CITES is growing. Therefore, governments need to collect data on these species and to prepare management plans when needed. Identification of elasmobranchs (sharks & rays) species is fundamental of data collection and law enforcement related to CITES. Expertise on identification and biological data collection on sharks and rays in the region needs to be strengthened. In addition, information on utilization of by-catch sharks and rays will be collected and compiled in order to enhance understanding on the importance of sharks and rays in the Southeast Asian region and necessity of fisheries management measures.

2. Background and Justification

About 126 thousand tons of sharks and rays were captured in 2009 in Southeast Asia. High demands for shark fin in Asia raise a concern about shark populations. In 1998, FAO proposed International Plan of Action for the Conservation and Management of Sharks (IPOA-SHARKS) corresponds to increase of shark catch. SEAFDEC conducted the basic study of sharks in the ASEAN region in 2003-2004. Species composition and landing were available for one year at major ports in Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam. Because of workshops on taxonomy and identification of sharks and rays by SEAFDEC in 2012 and 2014 and publications of three field guidebooks in 2012, 2013 and 2014, data collection on sharks and rays in the region is improving. However, fisheries data in sharks and rays are still insufficient in many Member Countries. On a regional level the pressure to list commercially important and valuable marine species on CITES is growing. Therefore, governments need to collect data on these species and to prepare management plans. Identification of elasmobranch species is fundamental of biological data collection. Expertise on identification and biological data collection on sharks and rays in the region need to be strengthened. Recognition of fully utilized by-catch sharks and rays by a socio-economic study is necessary in the region. Information on utilization of by-catch sharks and rays will improve fishery management in the region. These activities correspond to 2011 Resolution (No. 10: Strengthen knowledge/science-based development and management of fisheries through enhancing the national capacity in the collection and sharing of fisheries data and information) and Plan of Action (No.4: Enhance regional fishery information systems and mechanisms to facilitate sharing, exchange and compilation of statistics and information that are required at the sub-regional and regional level and apply, where appropriate, regionally standardized definitions and classifications for statistical data to facilitate regional compilation, analysis and data exchange; No. 76: Increase participation and involvement of Member Countries in international fora and

technical committees such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); Codex Alimentarius Commission; Food and Agriculture Organization of the United Nations (FAO); Office International des Epizooties (OIE); Regional Fisheries Bodies (RFBs); and World Trade Organization (WTO); and promote ASEAN interest, recognizing that fisheries policies of relevance to the ASEAN region are increasingly discussed and agreed upon at the global level) at the ASEAN-SEAFDEC Conference.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To train technical officers in the participating Member Countries to be able to collect taxonomic and biological data on sharks and rays in their countries	Outcome 1: Improved landing data collection on sharks and rays	Output 1: Taxonomic information of sharks and rays in the region	Activity 1: Identification of Sharks and Rays in the Southeast Asian Region 1.1 On-site training and data collection in the region 1.2 Workshops on identification of sharks and rays and Core Expert Meeting on Sharks Data Collection in the region
Objective 2: To obtain/summarize genetic information for shark and ray species identification in the region by DNA bar-coding	Outcome 2: Improved customs inspection	Output 2: Genetic information for sharks and rays species identification in the region has been obtained/ summarized by DNA bar-coding.	Activity 1: Identification of Sharks and Rays in the Southeast Asian Region 1.3 Identification of shark and ray species by DNA bar-coding
Objective 3: To collect information on utilization of sharks and rays in the region for proper fishery management and sustainable utilization	Outcome 3: Improved fishery management on sharks and rays	Output 3: Socio-economic and marketing information of sharks and rays in the region	Activity 2 :Utilization of By-catch Sharks and Rays

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Identification of Sharks and Rays in the Southeast Asian Region	MFRDMD will assist Member Countries to strengthen expertise on identification and biological data collection on sharks and rays in the region through on-site trainings and workshops. Also, MFRDMD will obtain and compile genetic information for shark and ray species identification in the region by DNA bar-coding.
Activity 2 Utilization of By-catch Sharks and Rays	MFRDMD will visit Member Countries and collect and compile information on utilization of sharks and rays in order to enhance understanding of the importance of sharks and rays in the Southeast Asian region and necessity of fisheries management measures. MFRDMD will hold Core Expert Meetings to summarize the information together with other information including biodiversity, taxonomy and draft of NDFs for SEAFDEC Member Countries.

3.3 Activity, Sub-activity and Proposed Budget for 2015-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 1: Identification of Sharks and Rays in the Southeast Asian Region	Sub-activity 1.1 On-site training in the region	18,400		8,430	10,420	
	Sub-activity 1.2 Workshops on identification of sharks and rays in the region		25,909	9,905		25,909
	Sub-activity 1.3: Identification of shark and ray species by DNA bar- coding	18,900	10,000	13,500	27,400	2,590
Activity 2: Utilization of By-catch Sharks and Rays	Sub-activity 2.1: Country visits	6,492		4,433	9,871	9,000
	Sub-activity 2.2: Summarization and publication					6,293
	Sub-activity 2.3: Core Expert Meeting				28,126	
	Sub-Total Budget	43,792	35,909	36,268	75,817	43,792

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION**1. Achievements of the Project Implementation for the Present Year**

Sub-activity 1.2: The Regional Training and Workshop on Chondrichthyan Taxonomy, Biology and Data Collection was conducted from 16-20 June 2019 at MFRDMD. Overall objective is to enhance human resource development in elasmobranch taxonomy and biology as well as technique in data collection of sharks and rays up to species level. Specific objectives are; to conduct a training course on chondrichthyans taxonomy and biology for new participants; to train trainees in the appropriate techniques in recording the morphometric and meristic data at landing sites; to train trainees in collecting and preserving specimens as well as to collect tissue samples for DNA study; to train trainees in collecting and preserving specimens; to train trainees in management of data recorded at landing sites for NDFs and other purposes. The training was attended by 18 participants from MCs (except Lao PDR, Singapore and Brunei Darussalam), TD and MFRDMD. Participants were trained on the species identification of sharks and rays, SOP for collection of tissue samples for DNA analysis, selecting of samples at landing site, and measurement technique of sharks and rays at landing sites as well as introduction of SEAFDEC-Shark Database. At the end of the training all participants are able to identify common sharks and rays in the region especially caught in coastal waters.

Sub-activity 1.3: Identification of shark and ray species by DNA bar-coding

MFRDMD had received a total number of 27 samples of sharks, rays and chimaeras collected from Andaman Sea (Thailand). We managed to identify their species through DNA barcode which consist two species of sharks (*Centrophorus granulosus* *Centrophorus cf. moluccensis*) six species samples of rays (*Rhinobatos ranongensis*, *Narcine prodorsalis*, *Benthobatis moresbyi*, *Cruriraja andamanica*, *Hexatrygon bickelli*, *Taeniurops meyeri*) and two species of chimaeras (*Chimaera macrospina* and *Hyrolagus cf. mitsukurii*). All of these samples except for *Taeniurops meyeri* were new specimens' species collection for MFRDMD data. Other 11 samples (10 samples of sharks and one sample of chimaera) are still in progress since it failed to get their DNA sequences.

Sub-activity 2.1: A survey on fishers' dependencies, marketing, and trade of sharks and rays at Pontianak, Banjarmasin, Balikpapan and Tarakan in Kalimantan Indonesia was conducted from 1-16 September in collaboration with researchers from Research Center for Fisheries Jakarta. The specific objectives are: to study the sharks and rays marketing and trade in Kalimantan; to identify the major actors in the marketing and trade of sharks and rays at study areas; to study the shark and ray marketing channels and practices in selected areas in Kalimantan; and to collect basic information on socio-economics and trade data for

preparation of NDFs for Indonesia. Initial findings showed that shark and ray resources are found to be important marketing products at all study sites in Kalimantan. Most products were in dried and fresh form. Domestic markets were to Java Island and foreign markets to many countries within and out site the region. Data on marketing channels at all study sites is now analyzed by all researchers and the result will be published by the first quarter of 2020.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1					
Sub-activity 1.2	Training and workshop	15 (7) Cambodia - 2 (0) Indonesia - 2 (2) Malaysia - 3 (1) Myanmar - 2 (1) Philippines - 2 (2), Thailand - 2 (1) Viet Nam - 2 (0)	10 (1) MFRDMD 9 (1) TD 1 (0)		25,909
Sub-activity 1.3	DNA analysis		3 (2) MFRDMD		0
Activity 2					
Sub-activity 2.1	Survey	2 (0) Indonesia	2 (0) MFRDMD		9,871

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.2	Improved landing data collection on sharks and rays/ Taxonomic information of sharks and rays in the region/ Yearly updated information on chondrichthyans biodiversity in the region	All participants are able to identify species of sharks and rays using guide books with guidance from lecturers during the training and workshop. The latest updated on the biodiversity of sharks in SEAFDEC Member Countries was published in 2019 in Indonesian Fisheries Research Journal, Volume 24 No 2: 133-140. The title of paper is 'Biodiversity and Habitat Preferences of Living Sharks in the Southeast Asian Region' Based on regional and national studies conducted by SEAFDEC and Member Countries since 1999, a total of 196 species of sharks from nine orders and 30 families have been recorded inhabiting from fresh water to deep ocean in this region. Publication of 'Identification guide on Sharks, Skates and Rays in the Southeast Asian Region' (Volume 2) in progress. This volume mostly focuses on deep sea species and coastal species not included in volume 1 published in 2017.

Planned activity	Expected outcome/output	Achievements
Sub-activity 1.3	Improved customs inspection/ Genetic information for species identification of sharks and rays in the region has been obtained/ summarized by DNA bar-coding.	MFRDMD had managed to get DNA sequences of 142 sharks' specimens, 261 rays' specimens, 18 skates' specimens and 2 chimaeras' specimens for DNA barcoding. These specimens consist of 43 species of sharks, 51 species of rays, 4 species of skates and 2 species of chimaeras.
Activity 2		
Sub-activity 2.1	Improved fishery management on CITES listed shark and ray species/socio-economic and marketing information of sharks and rays in Kalimantan Indonesia	Initial findings found that there is no part of shark and ray being wasted. There are high diversity of products produced from shark and ray excluding fin, such as meat, skin, cartilages, teeth, intestine, stomach; it generated massive livelihood for community not on the direct beneficial, such as fishers, boat owners, exporters, collectors, wholesalers, retailers and processors but also various labor workers in different level such as port workers and transportation; livelihood and source of protein has been significantly generated by shark and ray resources. Communities have dependency to the resources as part of their livelihood or affordable protein resources.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
1) Dharmadi, Andhika, P.P. and Ahmad A. 2019. Marketing and Trade of Sharks and Rays in Java and Sumatera, Indonesia. SEAFDEC/MFRDMD/43. 32pp	Book	Yes
2) Ahmad, A., Lim, A.P.K., Fahmi, Dharmadi and Krajangdara, T. 2017. Identification Guide to Sharks, Rays and Skates of the Southeast Asian Region (Volume 2) . SEAFDEC/MFRDMD/SP/31: Will be published by December 2019	Book	No
3) Mohd Amirullah, A, Hamizah, A and Ahmad, A. 2019. Proceeding of Core Expert Meeting on Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region 9 – 10 October 2018, Kuala Lumpur, Malaysia.	E-book	Yes
4) Ahmad, S., Ahmad, A., Tai, S.Y., Aswani, F.M.N., and Nurhafizah, M. 2019. Perception of Artisanal Fishers on Shark and Ray Resources, Proceeding Second Indonesia Sharks and Rays Symposium 2018: Ministry of Marine Affairs and Fisheries, Indonesia. ISBN: 978-979-789-055-1, pp 339-347.	Proceeding of Regional Workshop	Yes
5) Aswani, F.M.N., Ahmad, S., Tai, S.Y., Ahmad, A., and Nurhafizah, M. 2019. Dependency of Artisanal Fishers on Sharks and Rays in Sabah, Malaysia, Proceeding Second Indonesia Sharks and Rays Symposium 2018: Ministry of Marine Affairs and Fisheries, Indonesia. ISBN: 978-979-789-055-1, pp 349-358.	Proceeding of Regional Workshop	Yes
6) Illisriyani, I., Fatimah, M.A., Kusairi, M.N., Tai, S.Y., Ahmad, S., Ahmad, A., Aswani, F.M.N, Nurhafizah, M., and Allia, F.R. 2019. A Study on Domestic Marketing of Sharks and Rays in Sabah, Malaysia. Proceeding Second Indonesia Sharks and	Proceeding of Regional Workshop	Yes

List of completed publications for the year 2019	Type of media	Attached e-file
Rays Symposium 2018: Ministry of Marine Affairs and Fisheries, Indonesia. ISBN: 978-979-789-055-1, pp 193-203.		
7) Tassapon, K, Ahmad, A. Chavalit, V. Supachai, R and Nantarika, C, 2019 Guidebook to cartilaginous Fishes of Thailand and Adjacent Waters. Department of Fisheries Thailand. 146 pp. In press will be ready by November 2019	Book (in Thai Language)	No
8) Sukchai, A., Ahmad, A., Worawit, W. and Virgilia, T. S. Paving the Way for the Development of Non-detriment. Findings: Towards Precise Species Identification of Sharks and Rays in Southeast Asia. Fish for the people. Volume 17 Number 2: 2019; 10-15	Fish for the People	Yes
9) Ahmad, A. 2019. Status of Elasmobranch Fisheries in the Southeast Asian Region. Paper Presented at Training on Age Determination Using Vertebra for Sharks and Rays. 29 April-1 May 2019, Bangkok Thailand	Power point/Pdf	Yes
10) Ahmad, A. 2019. Overview on the Proposed Listing of Shortfin mako shark (<i>Isurus oxyrinchus</i>) Longfin mako shark (<i>Isurus paucus</i>) into CITES Appendices: Paper presented at Regional Consultation for Development of the ASEAN-SEAFDEC Common Position on the Proposed Listing of Commercially-exploited Aquatic Species into the CITES Appendices 30-31 January 2019, Bangkok, Thailand.	Power point/Pdf	Yes
11) Ahmad, A., Abdul Haris Hilmi, A.A., and Lawrence K. Jr. 2019. Possible Development of NDF documents for <i>Glucostegus</i> spp. <i>Rhina encylostoma</i> and <i>Rhynchobatus</i> spp. Paper Presented at National Workshop on Non-Detriment Findings (NDFs) for CITES Listed Marine Species 6-7 August 2019, Tawau, Sabah, Malaysia	Power point/Pdf	Yes
12) Ahmad, A. and Lawrence, K. Jr. 2019. NDFs for Sharks (Malaysia). Case study: NDFs for <i>Sphyrna lewini</i> in Malaysia. (Using Germanys' NDFs). Paper Presented at National Workshop on Non-Detriment Findings (NDFs) for CITES Listed Marine Species 6-7 August 2019, Tawau, Sabah, Malaysia.	Power point/Pdf	Yes
13) Ahmad, A. 2019. NDFs of Aquatic Marine Species in Malaysia. Paper Presented at National Workshop on Non-Detriment Findings (NDFs) for CITES Listed Marine Species 18 September 2019 Jakarta, Indonesia.	Power point/Pdf	Yes
14) Ahmad, A. 2019. Research Finding on Status of Sharks and Rays Resources and Biodiversity (Case Study in Malaysia). Paper presented at National Workshop on Non-Detriment Findings (NDFs) for CITES Listed Marine Species 18-19 July 2019 Bangkok, Thailand.	Power point/Pdf	Yes
15) Ahmad, A. NDFs for silky shark (<i>Carcharhinus falciformis</i>) in Indonesia. Paper presented at National Workshop on Non-Detriment Findings (NDFs) for CITES Listed Marine Species 18-19 July 2019 Bangkok, Thailand.	Power point/Pdf	Yes
16) Ahmad, A. 2019. Status Elasmobranch Fisheries in South East Asia. Paper Presented at Training on the Taxonomic Identification and SEAFDEC Data Collection Protocol for Sharks and Rays in the Philippines. 15-17 January 2019, Iloilo City. Philippines.	Power point/Pdf	Yes
17) Ahmad, A. 2019. Data Management for Stock Assessment Using Excel and Pivot Table. Paper presented at Training on the Taxonomic Identification and SEAFDEC Data Collection Protocol for Sharks and Rays in the Philippines. 15-17 January 2019, Iloilo City. Philippines	Power point/Pdf	Yes

List of completed publications for the year 2019	Type of media	Attached e-file
18) Ahmad, A. and Sato, A. 2019. Update on Progress and Status of Endangered Aquatic Species Issues. Position of the ASEAN-SEAFDEC Member Countries on the Listing of Commercially-Exploited Aquatic Species into the CITES Appendices at the CITES-COP18 (longfin and shortfin makos, guitarfishes, wedgefishes, three species belonging to the subgenus <i>Holothuria</i>). Paper presented at The Fifteenth Meeting of The ASEAN Working Group on the Convention on International Trade In Endangered Species on Wild Fauna and Flora and Wildlife Enforcement (15 th AWG-CITES and WE) 2-4 April 2019, Sandakan, Malaysia.	Power point/Pdf	Yes
19) Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. 2019. DNA Barcoding Revealed Species of Rays in Southeast Asian Region. Paper presented at National Research Seminar on 22-24 January 2019 at Fisheries Research Institute, Penang.	Power point/Pdf	Yes
20) Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. 2019. Species Identification of Sharks in Southeast Asian Region through DNA Barcoding Approach. Paper presented at National Research Seminar on 22-24 January 2019 at Fisheries Research Institute, Penang.	Power point/Pdf	Yes

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.2	Course Content: very good Course duration: appropriate Training Methods, Equipment and Facilities: Appropriate

6. Major Impacts/Issues

The major issue is lack of communication skill in English among participants and limited funding to conduct study and on-site training at large scale. In some case trained enumerators were promoted to higher level with new work commitments. New enumerators need to be trained each year to replace them. Some countries send wrong participants such as administrator and manager to attend training and workshop on taxonomy without and any basic knowledge on biology. They are not working in the field as well as in sharks' data collection project. When back to their countries most of them were not able to teach their enumerators to follow SOP on data collection provided by SEAFDEC. In this regard Member Countries should send qualified candidates as stated in the invitation letter those are directly involved in the data collection project. Participants from some countries also lack knowledge in statistics and need to be trained properly. In this regard data evaluation and verification workshop in each participating country are compulsory to ensure all data are validated by experts.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

Objective 1:

Since 2015, 40 participants attended the training and workshop at MFRDMD and more than 40 participants attended on-site training in Viet Nam. Trained participants from Member Countries, SEAFDEC and universities are able to identify species of sharks and rays using SEAFDEC guidelines with guidance by lecturers during the training and workshop conducted at MFRDMD. Most of participants from Member Countries are now working in the field on data collection under SEAFDEC and country funding.

The Core Expert Meeting on Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region was organized by the Marine Fishery Resources Development and Management Department (SEAFDEC/MFRDMD) in Kuala Lumpur, Malaysia from 9th – 10th October 2018. This meeting is part of the continuous efforts organized by SEAFDEC for sustainable utilization of sharks and rays in the Southeast Asian waters. The Core Expert Meeting aims at

obtaining information on the current landing data collection and trade of sharks and rays and discussing ways to improve the data/information collection in the new 5-year Japanese Trust Fund VI Phase II project from 2020-2024. The meeting was attended by the representatives from Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand, Viet Nam, SEAFDEC/Secretariat, SEAFDEC/TD, SEAFDEC/MFRDMD as well as resource persons from Japan Fisheries Research and Education Agency, Kasetsart University and Ubon Ratchathani University. Issues presented and discussed were including data collection/management (NPOA-Sharks)/CITES listed species, marketing, international trade (NDFs) and socioeconomic studies on sharks and rays.

Objective 2:

MFRDMD had collected samples from 16 locations namely Beluran, Kota Kinabalu, Sandakan and Tawau (Sabah); Kuantan, Temerloh, Pekan and Rompin (Pahang); Bagan Panchor (Perak); Dungun (Terengganu); Mukah (Sarawak) for Malaysia, Sihanoukville (Cambodia); Yangon (Myanmar); Phuket and Andaman Sea (Thailand) and Vung Tau (Viet Nam). Samples were collected during site visit and training program implemented for this project. MFRDMD had managed to sequence 142 sharks' specimens, 261 rays' specimens, 18 skates' specimens and 2 chimaeras' specimens for DNA barcoding. These specimens consist of 43 species of sharks, 51 species of rays, 4 species of skates and 2 species of chimaeras. From of this DNA sequence, 60% have been uploaded to the Barcode of Life Data Systems (BOLD; <http://boldsystems.org>) as reference globally. Some of the data were new DNA sequences in BOLD.

Objective 3:

Survey conducted in Java, Sumatera and Kalimantan in 2018 and 2019 found that there were high diversity of products produced from sharks and rays excluding fin, such as meat, skin, cartilages, teeth, intestine and stomach. Resources of sharks and rays generated massive livelihood for coastal communities of not only direct beneficiaries *i.e.* fishers, boat owners, exporters, collectors, wholesalers, retailers and processors but also various labor workers in different level of marketing channels such as, factories, port and transportation workers. A source of livelihood and protein has been significantly generated by shark and ray resources. Poor remote communities in the middle part of Indonesia depend on the dried meat of sharks and rays as protein resources. A survey report conducted in Java and Sumatera in 2018 was published in 2019.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1	
Sub-activity 1.1	On-site training was conducted at Vung Tau in Viet Nam in 2015, 2017 and 2018 in collaboration with SEAFDEC Secretariat. The 4 days-training were conducted by lectures, field trips at landing sites and laboratory works. In summary 20 participants attended the training and most of them were working in the field of data collection. Others were university lecturers and post graduate students. All specimens used during the training were preserved in formalin and ethanol at Vung Tau Fisheries Research Center for future references.
Sub-activity 1.2	Two workshops on identification of sharks and rays in the region were conducted at MFRDMD in 2016 and 2019. The 5-day trainings were conducted by lectures, field trips and laboratory work. During each training participant was guided to identify at least 30 species of sharks and 30 species of rays. All specimens were in fresh condition. At the end of training all specimens were preserved in formalin and ethanol in MFRDMD repository for future references.
Sub-activity 1.3	Necessary chemicals, disposable laboratory consumables, DNA extraction kits, a PCR machine were purchased for genetic analysis. DNA extraction, PCR analysis, sequencing was done by using mitochondrial <i>cytochrome oxidase I</i> (COI) universal primers (CCDB Protocols). Sequences were deposited in Genbank and BOLD after verification by blast search and construction of phylogenetic trees.
Activity 2	
Sub-activity 2.1	Country visits to study marketing and trade of sharks and rays were conducted in 2018 in Java (Jakarta, Cilacap, Pelabuhan Ratu, Surabaya,

List of Activities	Description of Implemented Activities
	Indramayu, Tegal and Seemarang) and Sumatera (Lampulo, Banda Aceh and Melabuh) and 2019 in Kalimantan (Pontianak, Banjarmasin, Balikpapan and Tarakan). Data were collected using standard form prepared by MFRDMD. Respondents interviewed were traders, factory owners, processors, middlemen, skippers, small scale processors and wholesales.
Sub-activity 2.2 (if any)	
Sub-activity 2.3	The Core Expert Meeting on Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region was organized by the Marine Fishery Resources Development and Management Department (SEAFDEC/MFRDMD) in Kuala Lumpur, Malaysia from 9 th – 10 th October 2018. The meeting was attended by the representatives from Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand, Viet Nam, SEAFDEC/Secretariat, SEAFDEC/TD, SEAFDEC/MFRDMD as well as resource persons from Japan Fisheries Research and Education Agency, Kasetsart University and Ubon Ratchathani University. Issues presented and discussed were including data collection/management (NPOA-Sharks)/CITES listed species, marketing, international trade (NDFs) and socio-economic studies on sharks and rays.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1	
Sub-activity 1.1	<p>Outcome: Improved landing data collection on sharks and rays. Landing data at several landing sites in participating countries are recorded at species level. The project is still continued in Malaysia, Myanmar, Cambodia and Indonesia using SEAFDEC and national budget.</p> <p>Output: Taxonomic information of sharks and rays in the region. The total number of shark, skate and ray species in the region increased especially on skates in Viet Nam, sharks in Myanmar and deep water sharks and rays in Thailand</p>
Sub-activity 1.2	<p>Outcome: Quality of landing data collection on sharks and rays in the region was improved based on presentation by participating countries. Some countries such as Indonesia and Malaysia manage to prepare NDFs for CITES listed species based on data collection project sponsored by SEAFDEC.</p> <p>Output: Taxonomic information of sharks and rays in the region. Based on regional and national studies conducted by SEAFDEC and Member Countries since 1999, a total of 196 species of sharks from nine orders and 30 families have been recorded inhabiting from fresh water to deep ocean in this region.</p>
Sub-activity 1.3	<p>Outcome 2: Improved customs inspection. Genetic information (DNA bar-coding) assists to distinguish the look-a-like species and incomplete specimen (a piece of tissue).</p> <p>Output 2: Genetic information for species identification of sharks and rays in the region has been obtained/summarized by DNA bar-coding.</p>
Activity 2	
Sub-activity 2.1	<p>Outcome: Improved fishery management on sharks and rays. Information on marketing and trade collected in 2018 and 2019 studies are very useful for Indonesia to prepare NPOA-Sharks as well as to prepare NDFs for new</p>

List of Activities	Achievements and Outcomes/Outputs of Activities
	listing of sharks and rays during CoP18. Output: Socio-economic and marketing information of sharks and rays in the region showed that many fishers in the region utilized almost all part of sharks and rays. A source of livelihood and protein has been significantly generated by shark and ray resources. Poor remote communities in the middle part of Indonesia and Malaysia depend on the dried meat of sharks and rays as protein sources. The survey report conducted in Java and Sumatera in 2018 was published in 2019. The report for Sabah was published in 2017 using the national fund.
Sub-activity 2.2 (if any)	
Sub-activity 2.3	The Core Expert Meeting on Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region was organized by the Marine Fishery Resources Development and Management Department (SEAFDEC/MFRDMD) in Kuala Lumpur, Malaysia from 9 th – 10 th October 2018. Papers presented during the CEM were published in an e-book proceeding.

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

All planned activities were successfully conducted with a very good cooperation from all AMSs. Some AMSs such as Malaysia and Indonesia manage to use landing and marketing data collected during the study period to prepare NDFs for CITES listed species such as scallop hammerhead sharks in Malaysia and silky sharks in Indonesia. Nevertheless, there were some issues on the reliability of the landing data collection because some participating countries were not able to record accurately due to less experiences and knowledge of their enumerators. The final report was prepared after all data were verify and correction was made accordingly by experts. The other issue was limited budget to hire enumerators to work more than five days a month. All AMSs except Thailand, Malaysia and Indonesia implementing the project totally depending on the SEAFDEC fund. The national data collection project will be terminated by AMSs after allocation of budget from SEAFDEC was stopped. With short-term length-weight data, information on stock status and biomass of each species especially CITES listed species is not possible to be estimated.

Survey to collect information on marketing and trade of sharks and rays conducted only in Java, Sumatera and Kalimantan in Indonesia. Information from other countries except Malaysia is scanty. At present most information on trade and marketing depends only on limited survey conducted by NGOs and some information is not true. Since resources of sharks and rays is very important as a source of income for livelihood of coastal fishers and a source of protein of poor communities in the region, this study should be extended to other countries such as Myanmar, the Philippines, Cambodia and Viet Nam.

The project has successfully obtained the genetic information for sharks and rays through DNA bar-coding, for present and future species identification. The DNA barcodes also have greatly assisted in confirmation of look-like species.

5. Publications and Others

2015

- Ahmad, A. 2015. Implementation of the National Pan of Action for Conservation and Management of Shark Resources in Malaysia (Malaysia NPOA-Shark). Southeast Asian Fisheries Development Center – Marine Fisheries Resources Development and Management Department. SEAFDEC/MFRDMD/SP/30, 55 pp.
- Ahmad, A., Annie, L.P.K., Fahmi, Dharmadi and Tassapon, K. 2015. Diversity and look-alike species of sharks and rays in the Southeast Asian waters. Paper presented at the Core Expert Meeting on Sharks and Rays in Southeast Asian Waters”, 3-4 March 2015, Quality Hotel, Kuala Lumpur.
- Wahidah, M.A., Ahmad, A., and Adam, K.P. 2015. Genetic species identification of sharks and rays at the JTF5 project in 2013-14. Paper presented at the Core Expert Meeting on Sharks and Rays in Southeast Asian Waters”, 3-4 March 2015, Quality Hotel, Kuala Lumpur.

4. Ahmad, A. 2015. Data collection of sharks and rays up to species. Malaysia experience. Paper presented at the Regional Technical Meeting on Sharks and Rays Data Collection and Project Planning Year 2015-2016. 26- 28 May 2015, Bangkok, Thailand.
5. Ahmad, A. 2015. Knowledge experience and lesson learnt in reviewing of non-detriment findings (NDFs) of Scallop hammerhead (*Sphyrna lewini*) in Malaysia. Paper presented at the Regional Technical Meeting on Sharks and Rays Data Collection and Project Planning Year 2015-2016. 26 - 28 May 2015, Bangkok, Thailand.
6. Robert, H., Ahmad, A., and U Saw, H. S. 2015. Status of the sharks and rays fishery within Myanmar Including socio-economic importance. TCP Report No 12, May 2015. BOBLME/FFI. 36p Robert, H., Ahmad, A., and U Saw, H. S. 2015. Status of the sharks and rays fishery within Myanmar Including socio-economic importance. TCP Report No 12, May 2015. BOBLME/FFI. 36p
7. Ahmad, A., Abdul Haris Hilmi, A. A and Ismail, I. 2015. Implementation of the National Plan of Action for Conservation and Management of Shark Resources in Malaysia (Malaysia NPOA-Shark). BOBLME Terminal Report. 35pp

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8. Ahmad, A. 2016. Case study: NDFs for *Sphyrna lewini* in Malaysia. Paper Presented at Workshop on CITES Species Non-detriment Findings (NDFs) 21 to 22 July 2016 Sandakan, Sabah Malaysia
9. SEAFDEC MFRDMD. 2016. DNA Barcoding of Sharks and Rays. Special Report of SEAFDEC Newsletter 39 (4), 8-9.
10. Wanchana, W and Ahmad, A. 2016. Application of Standard Operating Procedures for Collecting Data on Sharks and Rays in Southeast Asian Countries. Fish for the People, 43 (3), 51-55.
11. Wanchana, W and Ahmad, A. 2016. Recording Sharks and Rays Statistics from Southeast Asia at Species Level. Fish for the People, 14 (1), 2-6.
12. Ahmad, A., Lim, P.K. 2016. Elasmobranch biodiversity in the Southeast Asian Region. Paper presented at On-site training on taxonomy and biology of elasmobranch in Viet Nam. Vun Tau, Viet Nam; 23-27 May 2016
13. Ahmad, A., and Lim, A.P. 2016. Introduction to taxonomy and biology of Chondrichthyes. Paper presented at On-site training on taxonomy and biology of elasmobranch in Viet Nam. Vun Tau, Viet Nam; 23-27 May 2016
14. Wahidah, A., Adam Luke, A.P and Ahmad, A. 2016. DNA barcoding technique for identification of Chondrichthyes species and SOP for collecting tissue sampling for DNA study. Vun Tau, Viet Nam; 23-27 May 2016
15. Ahmad, A. 2016. Analysis of Shark and Ray Landings Data for Fisheries Management in Myanmar using Pivot Table. Paper Presented at National Workshop on Validation of Sharks and Rays Landing Data, 9-11 February 2016 Yangon, Myanmar.
16. Ahmad, A. 2016. Analysis of Shark and Ray Landings Data for Fisheries Management in Thailand using Pivot Table. Paper Presented at National Workshop on Validation of Sharks and Rays Landing Data, 29-30 April 2016, Songkhla, Thailand.
17. Ahmad, A. 2016. Analysis of Shark and Ray Landings Data for Fisheries Management in Viet Nam using Pivot Table. Paper Presented at National Workshop on Validation of Sharks and Rays Landing Data. 22- 27 May 2016. Vun Tau, Viet Nam.
18. Tai, S. Y., Kusairi, M.N., Ahmad, S., Fatimah, M.A., Ahmad, A., Aswani Farhana, M.N. and Nurhafizah, M. 2016. A Study on Fishers Dependencies and Marketing of Sharks and Rays in Sabah. Paper presented at the FAO Meeting on the Impacts of CITES Listing of Sharks and Rays in the South and Southeast Asian Region 19-20 April 2016, Penang.
19. Ahmad, A. 2016. Inclusion of the genus *Mobula spp.* in Appendix II CITES. Paper presented at 'SEAFDEC Experts Meeting on Commercially-exploited Aquatic Species' 16-17 May 2016, Bangkok, Thailand.
20. Ahmad, A., Abdul Haris Hilmi, A.A, Lawrence. K.Jr. Kissol Jr., and Lim, A.P.K. 2016. Research Findings on the Status of Chondrichthyans Biodiversity in Malaysia. Paper Presented at CITES Species Non-Detriment Findings Workshop (NDFs), 21-22 July 2016, Sandakan, Sabah Malaysia.
21. Ahmad, S., Tai, S. Y., Fatimah, M. A., Kusairi, M. N., Ahmad, A., Aswani Farhana, M. N. and Nurhafizah, M. 2016. A Study on Fishers Dependencies of Sharks and Rays in Sabah. Paper presented at CITES Species Non-Detriment Findings Workshop (NDFs), 21-22 July 2016, Sandakan, Sabah Malaysia
22. Ahmad, A. 2016 Introduction to CITES Sharks and Rays Non-Detriment Findings (Germany's NDF). Paper Presented at CITES Species Non-Detriment Findings Workshop (NDFs), 26-27 July 2016, Jakarta, Indonesia.

23. Ahmad, A. 2016. Standard Operational Procedures on Sharks Data Collection. Paper presented at 'Project-end-Meeting on Sharks Data Collection in Southeast Asia 16 - 18 August 2016, Manila, Philippines.
24. Abdul Haris Hilmi, A.A. and Ahmad, A. 2016. Status of Data Collection of Shark and Ray Landings in Perak. Paper presented at CITES Species Non-Detriment Findings Workshop (NDFs), 21-22 July 2016, Sandakan, Sabah Malaysia.
25. Lawrence, K., and Ahmad, A. 2016. Status of Data Collection of Shark and Ray Landings in Perak. Paper presented at CITES Species Non-Detriment Findings Workshop (NDFs), 21-22 July 2016, Sandakan, Sabah Malaysia.
26. Fatimah, M. A., Tai, S. Y., Ahmad, S., Kusairi, M. N., Ahmad, A., Aswani Farhana, M. N. and Nurhafizah, M. 2016. Progress of Marketing of Sharks and Rays study in Sabah. Paper Presented at CITES Species Non-Detriment Findings Workshop (NDFs), 21-22 July 2016, Sandakan, Sabah Malaysia.

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27. Ahmad, A., Lim, A.P.K., Fahmi, Dharmadi and Krajangdara, T. 2017. Identification Guide to Sharks, Rays and Skates of the Southeast Asian Region. SEAFDEC/MFRDMD/SP/31:32pp
28. Ahmad, A., Abdul Haris Hilmi, A.A., Abe, O., Dharmadhi, Fahmi, Lim, A. P.K. and Krajangdara, T. 2017. Standard Operating Procedures (SOP) Sharks, Rays and Skates Data Collection in the Southeast Asian Waters. SEAFDEC-TD, Bangkok: 41pp
29. Fatimah, M. A., Kusairi, M. N., Tai, S. Y., Ahmad. S., Ahmad, A., Nurhafizah, M., Aswani Farhana, M. N., Allia Farhana R. 2017. Marketing of Sharks and Rays in Sabah and International Trade of Malaysia's Sharks and Rays. SEAFDEC/MFRDMD/SP33
30. Ahmad, A., Worawit, W., Isara, C. 2017. Sharks, Rays and Skates Data Collection in the Southeast Asian Waters (2015-2016). Paper Presented at Workshop Cooperation on Implementing CITES for Marine Species: Achievements, Lessons Learned and Future Opportunities, 13-15 Mac, Geneva, Switzerland.
31. Abdul Haris Hilmi, A.A., Ahmad, A., Lawrence, K. 2017. Data Collection on Sharks and Rays by Species In Malaysia (August 2015 – July 2016). SEAFDEC/MFRDMD/SP/34.92
32. Tan, G.H., Ahmad, A., Syed Abdullah, S.A.L., Haryati, W. and Faizah, I. 2017. Malaysia initiative on threatened species management and conservation. Paper presented at CTI-CFF First Threatened species working group meeting, 22-23 Mac 2017, Putrajaya. Malaysia.
33. Tan, G.H., Ahmad, A., Syed Abdullah, S.A.L., Haryati, W. and Faizah, I. 2017. Roadmap on the conservation and management of threatened species in Malaysia. Paper presented at CTI-CFF First Threatened species working group meeting, 22-23 Mac 2017, Putrajaya. Malaysia.
34. Ahmad, A. 2017. Regional initiatives related to improvement of shark data collection in SEA through various programs/projects implementing by MFRDMD. Paper presented at the Technical Workshop on Improvement of Regional Fisheries Statistics on Sharks. 13-15 June 2017, Bangkok Thailand.
35. Ahmad, A. 2017. MFRDMD involvement in improvement of shark data collection in SEA. Paper presented at: Regional initiatives related to improvement of shark data collection in SEA through various programs/projects implementing, 13-15 June 2017, Siem Reap, Cambodia.
36. Wahidah M.A., Noorul-Azliana J., Ahmad A., Le Huu Tuan Anh, Adam-Luke P. & Annie-Nunis B. DNA Barcoding of Rays in Malaysia and Viet Nam. Paper presented at Asian Society of Ichthyologists 2017, 22-24 August 2017, Ho Chi Minh, Viet Nam.
37. Noorul-Azliana J. Wahidah M.A., Ahmad A., Le Huu Tuan Anh, Adam-Luke P. & Annie-Nunis B. DNA Barcoding reveals of Sharks in Malaysia and Viet Nam. Paper presented at Asian Society of Ichthyologists 2017, 22-24 August 2017, Ho Chi Minh, Viet Nam.
38. Wahidah M.A., Noorul-Azliana J., Ahmad A., Le Huu Tuan Anh, Adam-Luke P. & Annie-Nunis B. DNA Barcoding of Rays in Viet Nam. Paper presented at On-Site Training on Chondrichthyns Taxonomy and Biology diadakan di South Research Sub-Institute for Marine Fisheries (SORESIMF) Vung Tau, Viet Nampada 26 – 29 September 2017.
39. Noorul-Azliana J. Wahidah M.A., Ahmad A., Le Huu Tuan Anh, Adam-Luke P. & Annie-Nunis B. DNA Barcoding reveals of Sharks in Malaysia and Viet Nam. Paper presented at On-Site Training on Chondrichthyns Taxonomy and Biology diadakan di South Research Sub-Institute for Marine Fisheries (SORESIMF) Vung Tau, Viet Nam pada 26 – 29 September 2017.

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40. Ahmad, S., Aswani Farhana. M.N., Ahmad, A., Tai, S. Y., Nurhafizah M, and Lawrence, K. Jr (2018). A Study of Fisheries Dependency on Sharks and Rays in Sabah, Malaysia, SEAFDEC/MFRDMD/SP/38. 59 pp.
41. Ahmad, A., Dharmadi, Andhika, P. P. and Mohd Saki Nor. (2018). A Survey on Fishers Dependencies, Marketing and Trade of Sharks and Rays in Java and Sumatera, Indonesia (30 July-7 Sep. 2018). Paper present at Core Expert Meeting on Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region, 9-10 October 2018 Kuala Lumpur, Malaysia
42. Friedman, K., Gabriel, S., Abe, O., Ahmad Adnan, N., Ahmad, A., Raja Bidin, R.H., Cadrin, S. X., Cornish, A., De Meulenaer, T., Dharmadi., [Fahmi., Tuan Anh, L. H., Kachelriess, D., Kissol, Jr. L., Krajangdara, T.,] Abdul Rahman, W., [Tanoue, W., Tharith, C., Torres, Jr. F., Wanchana, W., Win, S., and Yokawa, K. 2018. Examining the Impact of CITES Listing of Sharks and Rays in Southeast Asian fisheries. Fish and Fisheries. 2018. 1–15. [https:// doi.org/10.1111/faf.12281](https://doi.org/10.1111/faf.12281).
43. Ahmad, A. 2018. NPOA-Shark Example from Malaysia. Paper presented at the Myanmar National Working Group on Sharks and Rays meeting, Nay Pi Taw, Myanmar (17-18 July 2018).
44. Ahmad, A., Lawrence, K. and Yusri, Y. 2018. Case study: NDFs for *Sphyrna lewini* in Malaysia (Using Germanys' NDF). Paper presented at the ASEAN CITES WORKSHOP Implementing the sharks and rays Appendix II Listings on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 21-23 March 2018 Manila, Philippines.
45. Ahmad, A. 2018. Shark Data and Management in Place in The Region for Both These Species and Sharks More Widely (Including RFMO Measures and WCPFC Data). Paper presented at the ASEAN CITES WORKSHOP Implementing the sharks and rays Appendix II Listings on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 21-23 March 2018 Manila, Philippines.
46. Ahmad, S., Ahmad, A., Tai, S. Y., Aswani Farhana, M. N. and Nurhafizah M. 2018. Perception of Artisanal Fishers on Shark and Ray Resources. Paper presented at 2nd Indonesia Shark and Ray Symposium. 28-29 Mac 2018, Jakarta, Indonesia.
47. Aswani Farhana, M. N., Ahmad, S., Tai, S. Y., Ahmad, A. and Nurhafizah, M. 2018. Dependency of Artisanal Fishers on Sharks and Rays in Sabah, Malaysia. Paper presented at 2nd Indonesia Shark and Ray Symposium. 28-29 Mac 2018, Jakarta, Indonesia.
48. Illisriyani, I., Fatimah, M.A., Kusairi, M.N., Tai, S.Y., Ahmad, S., Ahmad, A., Aswani, F.M.N, Nurhafizah, M., and Allia, F.R. 2019. A Study on Domestic Marketing of Sharks and Rays in Sabah, Malaysia. Paper presented at 2nd Indonesia Shark and Ray Symposium. 28-29 Mac 2018, Jakarta, Indonesia.
49. Ahmad, A. 2018. Recent on Shark Diversity, Biology and Fisheries Impact for Sharks and Rays in Southeast Asian region. Paper presented at Training Workshop on Sharks and Rays Stock Assessment by Using YPR Model. 4-10 June 2018, SEAFDEC/TD, Samut Prakan, Thailand.
50. Ahmad, A. Introduction to Taxonomy and Biology of Sharks, Skates, Rays and Chimaeras. Paper presented at Training on Taxonomy and Market Survey Techniques on Sharks and Rays for University Lecturers, DoF Myanmar and NGOs Officers in Myanmar. Myeik University, Myanmar 13-16 November 2018.
51. Ahmad, A. 2018. Introduction to the taxonomy and biology of Chondrichthyans. Paper presented at Special training for Cambodian Officers, Kuala Terengganu. 17-19 September 2018
52. Akbar, B. J., Muhamad Asrul, M. A., Wahidah, M. A., Jalal, K. C. A. and Hassan I. S. 2018. DNA Barcoding of Rays from the South China Sea. In: Subrata, T. et al. (eds.) DNA Barcoding and Molecular Phylogeny. Springer: pp.229-244.
53. Wahidah, M. A. & Noorul Azliana, J. 2018. DNA Barcoding of Sharks, Rays and Skates in Viet Nam. Paper presented at On Site Training of Elasmobranches, 25-26 September 2018, Vung Tau, Viet Nam,
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55. Wahidah, M. A. & Noorul Azliana, J. 2018. DNA Barcoding of Rays and Skates in the Southeast Asian region. Paper presented at Core Expert Meeting on Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region, Kuala Lumpur on 9-10 October 2018.

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

			Project ID: 201706005
Program Category:	ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia		
Program Strategy No. :	I	Total Duration:	August 2017 - July 2019
Lead Department:	Secretariat (SEC)	Lead Country:	Indonesia
Donor/Sponsor:	Japanese ASEAN Integration Fund (JAIF)	Total Donor Budget:	USD 842,852.80
Project Partner:	None	Budget for August 2018 – July 2019:	USD 842,852.80
Project Leader:	Isao Koya, Assistant Project Manager for the JTF	Project Participating Country(ies) :	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Tropical anguillid eels are drawing more attention to compensate the shortage of supply of eel seeds for aquaculture (eel farming) in recent years. However, there are no historical record on the status of tropical anguillid eel resources, catch statistics especially on juveniles for seeds, and eel farming production in Southeast Asia. This project will strengthen the statistics data collection system and clarify the basic resource condition of tropical anguillid eels. Also, it is envisaged to improve survival rate of juvenile eels under aquaculture in ASEAN Member States (AMSs) by improving eel aquaculture technologies. In addition, it is needed that tropical anguillid eel resources should be properly conserved and managed to prevent the overexploitation and listing on CITES appendices in consequence.

Overall objective of this project is to strengthen and consolidate eel resource management framework for sustainable provision of eel products and eel capture fisheries/eel farming in AMS. Overall goal of this project is to promote the sustainable eel fishery in AMS. The project is also expected to contribute to the ASEAN Economic Community Blueprint 2025: specifically, “Increase of fishery/aquaculture production (C.5. 57. i)” and “Enable sustainable production (C.5. 57. iii)”. The project is going to be implemented by Southeast Asian Fisheries Development Center (SEAFDEC) in collaboration with all ASEAN Member States for two years. The proposed funding support is from the “Japan ASEAN Integration Fund” (JAIF) through the ASEAN Secretariat and ASEAN body namely the ASEAN Sectoral Working.

2. Background and Justification

2.1 Problem Analysis

Eel farming is reliant on wild-caught anguillid eels such as glass eel, elver and yellow eel. With the rapid decline of temperate anguillid eel juveniles such as Japanese eel (*Anguilla japonica*), European eel (*A. anguilla*) and American eel (*A. rostrata*) in recent years, tropical anguillid eels are drawing more attention to compensate the shortage of supply of eel seeds for aquaculture. Tropical anguillid eels have so much potential for commercial freshwater aquaculture given the appropriate technology and resource management practices to ensure their sustainable use.

SEAFDEC organized an international regional workshop on “Enhancement of sustainability of catadromous eel resources in Southeast Asia” on 27-29 April 2016, to clarify technical issues and confirmed the necessity for sustainable utilization of eel resources. The results of the workshop indicated that there were not enough statistical records among AMS related to the status of exploited tropical anguillid eel resources (fisheries) and eel aquaculture production, including effective measures to sustainably manage the eel resources. It is essential that tropical anguillid eel resources should be properly conserved and managed to prevent its overexploitation and listing in the CITES appendices.

2.2 Regionality

The demands of anguillid eel products are expected to expand significantly in Japan, China and South Korea as well as AMS. In addition, the main producing areas of tropical anguillid eels are in AMS. Hence, the appropriate utilization of anguillid eel resources is required to ensure food and livelihood security of the people that depend on the resources.

2.3 Participation

AMS (Government officers involve in capture fisheries and aquaculture departments; fisheries bureaus which manage the eel resources and develop the national plan on eel industry; scientists/researchers of the fisheries research agencies/institutes and universities; eel fishers/farmers.)

2.4 Beneficiaries

- Direct/immediate beneficiaries are eel fishers/farmers and government officers in AMS.
- Indirect beneficiaries are both the eel producing and consuming countries.
- SEAFDEC secretariat, Inland Fishery Resources Development and Management Department (IFRDMD), and Aquaculture Department (AQD).

2.5 Project History

A Regional Workshop on ‘Enhancement of sustainability of eel resources in South Asia was initially organized on 27-29 April 2016 in SEAFDEC-Thailand. The workshop resulted in the identification of technical issues and problems related to the sustainable utilization of eel resources, which include: i) lack of statistical records on the status of exploited tropical anguillid eel resources; ii) lack of production data on eel aquaculture; and iii) lack of effective measures to manage eel resources among AMS.

3) Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outputs	Activities	Indicator
Resource management framework* for sustainable anguillid eel fisheries in AMS is consolidated. **“Framework” here is a scheme consisting of experts, technologies/methodologies and rules essential for sustainable eel fisheries/aquaculture.	Output 1: The statistical data collection system is strengthened in AMS to better understand the present status and past/future trends on tropical anguillid eels at each species and stage.	Activity 1.1: Strengthening the statistical information collection system on juvenile anguillid eel fishery with indices of fishing efforts.	Indicator 1: Number of qualified staff for statistical data collection has increased in each AMS
		Activity 1.2: Strengthening the statistical information collection system on yellow and silver eel fishery with indices of fishing efforts	
Activity 1.3: Strengthening the statistical information collection system on anguillid eel farming production at each species.			
Activity 1.4: Developing the decisive method of species identification of juvenile anguillid eels with latest DNA fingerprint techniques.			
	Output 2: Tropical anguillid eel aquaculture technologies are improved in AMS.	Activity 2.1: To collect the data of survival rate of juvenile anguillid eels (from glass eel to elver stage) in the eel farms in various places in AMS, with the additional information of species, source of seeds, handling methods, transportation methods, water condition, feed for initial seedling, and the other	Indicator 1: Main factors that drop the survival rate of juvenile eels are identified and consolidated, Indicator 2: Improved technologies for higher survival of eel juveniles are

Objective	Outputs	Activities	Indicator
		possible causes/reasons that might affect the survival of juvenile anguillid eels.	identified. Indicator 3: A manual is developed to propose improved eel farming technologies. Indicator 4: Staff in charge of eel aquaculture of all AMS understand the technologies to improve survival rate of juvenile anguillid eels.
		Activity 2.2: To identify critical factors those contribute to high mortality rates of eel juveniles (glass eels) in captive rearing conditions (eel farm).	
		Activity 2.3: To develop strategies (or protocols) for improved survival of eel juveniles under captive rearing conditions.	
		Activity 2.4: To publish a manual on improved protocols for farming of eels, including handling and transport from collection grounds to the farm for use of eel farmers, government extension workers and other stakeholders.	
	Output 3: Knowledge on the methodologies for collecting statistical information and tropical anguillid eel resource management is enhanced at the central and regional level.	Activity 3.1: To summarize the results of the trend of tropical anguillid eel resources at each species and stage obtained through Activities 1 and 2 then evaluate the present situation and trend of anguillid eel resources in AMS.	
		Activity 3.2: To conduct three different meetings, which include: 1) Two Regional Workshops 2) Two Training for Trainers courses in Japan 3) Two Assessment Committee meetings held in Bangkok, Thailand	

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Sub-activity 1.1: Strengthening the statistical information collection system on juvenile anguillid eel fishery with indices of fishing efforts.	1.1.1: To study and analyze the methods and processes for collecting statistical information on juvenile anguillid eel fishery with indices of fishing efforts. 1.1.2: To recommend appropriate statistical collection methods and provide list of important contents/items of the catch statistics of juvenile anguillid eels (including the indices of fishing effort) by major fishing grounds and/or countries that have (or have potential of starting) juvenile anguillid eel fishery. 1.1.3: To support the national/local governments and/or fishers' committees to strengthen the system for statistical collection with fishing effort indices at each country/fishing ground of juvenile anguillid eels.

Activity	Description
<p>Sub-activity 1.2: Strengthening the statistical information collection system on yellow and silver eel fishery with indices of fishing efforts.</p>	<p>1.2.1: To study and analyze the methods and processes for collecting statistical information on yellow and silver eel fishery with indices of fishing efforts. 1.2.2: To recommend appropriate statistical collection methods and provide list of important contents/items of the catch statistics of yellow/silver eel (including the indices of fishing effort) by major fishing grounds and/or countries that have (or have potential of starting) anguillid eel fishery. 1.2.3: To support the national/local governments and/or fishers' committees to strengthen the system for statistical collection with fishing effort indices at each country/fishing ground of yellow/silver eels.</p>
<p>Sub-activity 1.3: Strengthening the statistical information collection system on anguillid eel farming production at each species.</p>	<p>1.3.1: To study and analyze the methods and processes for collecting statistical information on eel farming production. 1.3.2: To provide recommendations to the national/local governments and/or eel farmers' committees on the establishment of statistical collection system for eel production from eel farming at each species. To investigate whether statistics of eel farming production have been existed or not at each country.</p>
<p>Sub-activity 1.4: Developing the decisive method of species identification of juvenile anguillid eels with latest DNA fingerprint techniques.</p>	<p>1.4.1: To review the studies on species identification of tropical anguillid eels in Southeast Asia 1.4.2: To collect juvenile anguillid eels for analyses using DNA technology. 1.4.3: To estimate the actual quantities and trends of eel seeds catch according to species using the species composition ratio applied into the catch statistics of eel seeds.</p>
<p>Activity 2 Aquaculture techniques to improve the survival rate of juvenile tropical anguillid eel will be developed and disseminated in AMS.</p>	<p>2.1: To collect the data of survival rate of juvenile anguillid eels (from glass eel to elver stage) in the eel farms in various places in AMS, with the additional information of species, source of seeds, handling methods, transportation methods, water condition, feed for initial seedling, and the other possible causes/reasons that might affect the survival of juvenile anguillid eels. 2.2: To identify critical factors those contribute to high mortality rates of eel juveniles (glass eels) in captive rearing conditions (eel farm). 2.3: To develop strategies (or protocols) for improved survival of eel juveniles under captive rearing conditions. 2.4: To publish a manual on improved protocols for farming of eels, including handling and transport from collection grounds to the farm for use of eel farmers, government extension workers and other stakeholders.</p>
<p>Activity 3 The methodology for collecting statistical information and measures for resource management of tropical anguillid eel will be enhanced. For this purpose, workshops (statistical, regional resources management), Regional meetings, Assessment Committee meeting are conducted.</p>	<p>3.1: To summarize the results of the trend of tropical anguillid eel resources at each species and stage obtained through Activities 1 and 2 then evaluate the present situation and trend of anguillid eel resources in AMS. 3.2: To conduct three different meetings, which include: i. Two Regional Workshops: one regional statistics workshop, and another one on regional resource management workshop. The aims are in order to disseminate the methodologies on statistical information gathering system on anguillid eels for the official staffs from all AMSs who shall supervise the eel collectors and eel farmers. The workshops will be held in Bangkok, Thailand; ii. Two Training for Trainers courses in Japan: one on DNA analysis for IFRDMD and the other on aquaculture for AQD. And Three Regional Meetings held in Viet Nam, Philippines and Indonesia, respectively. The aims are to share the information and knowledge obtained through the activities among all AMSs, Japan and related organizations; and iii. Two Assessment Committee meetings held in Bangkok, Thailand to confirm and evaluate the progress of the project activities.</p>

3.3 Activity, Sub-activity and Proposed Budget for 2017 (August)-2019 (July)

(Unit: USD)

Activity	Y1 2017(August)-2018(July)	Y2 2018(August)-2019(July)
Activity 1:	246,241.91	60,164.09
Activity 2:	10,151.92	118,616.08
Activity 3:	100,856.32	182,777.68
Common expense	36,000	36,000
Contingency	52,044	

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

The achievements of the project implementation from August 2018 to July 2019 are as follows.

Activity 1 (Statistical survey)

- The statistical survey (catch and aquaculture statistics survey) were conducted in the six countries (Cambodia, Indonesia, Myanmar, Philippines, Thailand, Viet Nam) of the ten AMSs where anguillid eel fishery is existing for grasping the utilization situation of anguillid eel resources eel in the ASEAN region.
- The areas where anguillid eels are caught in six countries were selected and field statistics survey was conducted by interview to consolidator and farmers. (Baseline survey)
- Also catch data and CPUE every month from eel consolidators who collected anguillid eels in Indonesia, Philippines and Myanmar Viet Nam were collected. (regular survey). The trend of status on tropical anguillid resources was analyzed.
- DNA data of anguillid eel from Indonesia, Myanmar, Philippines, Viet Nam was analyzed to determine population genetic structure.

Activity 2 (Survival rate survey)

The survival rate survey has been conducted by cultivating the glass eel caught on Luzon Island in Philippines. The influence of food type on survival rate was examined.

Nursery rearing of glass eels collected from Aparri in Luzon Island in Philippine at different stocking densities.

Feeding trials using different types of natural food and formulated diet for the nursery rearing of glass eels
An interview survey for collecting information on improvement survival rate of juvenile eel was conducted in the Philippines, Viet Nam. Technical methods to reduce mortality rate of glass eel were analyzed and compiled the information.

Activity 3(Enhancing resources management of tropical anguillid eels)

As activities related to Activity 3, workshops and regional meetings were held as follows.

1)Project planning meeting

This meeting was held on 4th August 2017 in Bangkok Thailand to finalize tasks with institutions involved in the project implementation. The purpose of this meeting is to confirm the project activities and design the detailed plans at the start of the project.

2) The progress meeting of implementation activities on the project

This meeting was held on 11th December 2017 in Palembang, Indonesia. The meeting was conducted to determine the progress of the project activities, evaluate the results of the various activities thus far, compile and discuss plans for the future.

3) The Assessment Committee Meeting

This meeting was held on 19th December 2017 in Bangkok Thailand. The purpose of this meeting was arranged for the assessment committee members and participants of each ASEAN country to evaluate whether the research methods of the project are appropriate and effective in achieving the project purpose.

4) The First Regional Meeting

The meeting was held on 25th January 2018 in Bangkok, Thailand. The purpose of the meeting was to present the results obtained through the activities of the project thus far, and to summarize the management policies for tropical anguillid eels that each country was implementing and planning.

5) International Technical Workshop on tropical anguillid eel in southeast Asia

This meeting was held on 7th -8th June 2018 in Bangkok, Thailand. The purpose of this meeting was to create the information document “Status and resources management of tropical anguillid eels in Southeast Asia” for posting on website of the CITES 30th Meeting of the Animals Committee based on the findings obtained through the activities of the project thus far.

6) The Second Regional Meeting

This meeting was held on 18th -19th October 2018 in Bangkok, Thailand. The objectives of this meeting were to: 1) share the information obtained through the project activities and the information from the ASEAN countries, and 2) formulate a common policy guideline among ASEAN Member States to conserve and manage tropical anguillid eels.

7) Workshop on Statistics/Aquaculture of tropical anguillid eel in southeast Asia

This meeting was held on 23rd and 24th -25th April 2019 in Manila, Philippines. The purpose of this meeting was: to present the various statistical information obtained from the activities of the project, as well as the results of refinement of techniques to improve the survival rate of glass eels.

8) The Third Regional Meeting

This meeting was held on 22nd -23rd July 2019 in Bangkok Thailand. The purpose of this meeting was to present and evaluate the final results of the activities conducted in the project and to finalize the draft of the project report. The final report will be submitted to the ASEAN Secretariat and will also be posted on the SEAFDEC website and published.

2. Information of Present Year Activity including Involved Stakeholders (August 2017-July 2019)

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1	III	159(38)	230(128)	65(19)	60,164.09
Activity 2	III	15(4)	17(9)	6(2)	118,616.08
Activity 3	IV	111(30)	125(66)	53(14)	182,777.68

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1	The statistical data collection system is strengthened in AMS to better understand the present status and past/future trends on tropical anguillid eels at each species and stage.	Catch and aquaculture production data were collected by statistical survey form six countries where eel fishery is existing. These data were compiled and analyzed to clarify status of utilization on tropical Anguillid eels in Southeast Asia.
Activity 2	Tropical anguillid eel aquaculture technologies are improved in AMS.	Survey on the survival rate of glass eel in aquaculture have been carried out and analyzed. Aquaculture techniques to improve survival rate of juvenile anguillid eel were developed.

Planned activity	Expected outcome/output	Achievements
Activity 3	Knowledge on the methodologies for collecting statistical information and tropical Anguillid eel resource management is enhanced at the central and regional level.	To summarize the result of current status and trends of tropical anguillid eel resources through statistical survey and survival rate survey. The project report including all result obtained through this project activity was compiled and published.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
Nursery Culture of Tropical Anguillid Eels	Publication	https://repository.seafdec.org.ph/handle/10862/48/recent-submissions
Report on “Enhancing sustainable utilization and management scheme of tropical Anguillid eel resources in Southeast Asia”	Publication	http://repository.seafdec.org/handle/20.500.12066/5488

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1	Not available because there is no training course activity.
Activity 2	Not available because there is no training course activity.
Activity 3	Not available because there is no training course activity.

6. Major Impacts/Issues

1. The statistical survey (catch statistics, aquaculture production statistics) for six countries where anguillid eel fishery is existing was conducted and developed data collection methods of Anguillid eel resources. The catch of tropical anguillid eel species in the target countries can easily collect data on the area where the eel consolidator concentrates, but it is difficult in the area where the eel consolidators are extensive. In the future, it will be necessary to incorporate a system constructed in this project for collecting tropical eel catches into the catch statistics surveys conducted by government in AMS.
2. The results of the two-year project activities have been compiled as a final report. This report was submitted to the ASEAN Secretariat, distributed to AMS, and posted on the SEAFDEC website. The creation of this report is highly valued because anyone can get the results of this project.

PART III: ACTIVITIES IN OVERALL PROJECT DURATION

1. Abstract of achievement in the overall project duration:

The achievements for each output in this project are as follows:

Output: 1

The statistical data collection system is strengthened in AMS to better understand the present status and past / future trends on tropical anguillid eels at each species and stage.

- A survey (baseline survey) to collect the catch / aquaculture production of tropical anguillid eel in the Southeast Asia countries where eel fishery is existing was conducted, and the utilization status of anguillid eel resources in each country was clarified.
- Monthly catch data was collected from Indonesia, Myanmar, Philippines and Viet Nam sites (regular survey) to clarify the status and trends of tropical anguillid eel stocks.
- The scheme for collecting statistical data of tropical anguillid eel species in Southeast Asia was strengthened.

Output: 2

Tropical anguillid eel aquaculture technologies are improved in AMS.

- Several techniques have been developed to improve the survival rate of juvenile tropical anguillid eels.
- Manuals on method technology to improve survival rate of juvenile tropical anguillid eels were prepared and disseminated to Southeast Asian countries.

Output: 3

Knowledge on the methodologies for collecting statistical information and tropical anguillid eel resource management is enhanced at the central and regional level.

- ‘Policy guidelines’ have been formulated to propose effective management measure for sustainable utilization of tropical eels.
- The schemes to collect catch / aquaculture production data and collection method to Southeast Asian countries was strengthened.
- Aquaculture technologies have been developed to improve the survival rate of juvenile eel, and these technologies have been compiled as aquaculture technique manual.
- A report was prepared with information on the eel fishery, analysis results, and developed techniques thought activities of this project. The report was distributed to countries in Southeast Asia and posted on the SEAFDEC website.

2. Implemented activities in the overall project duration

Proposed Activity	Description of Proposed Activity
Activity 1	<ul style="list-style-type: none"> - Implementation of statistical survey to grasp utilization status of anguillid eel resources in AMSs. - To analyze trend and status of anguillid eel resources from catch data including fishing effort information. - Implementation of DNA analysis to clarify the population genetic structure of anguillid eel species.
Activity 2	<ul style="list-style-type: none"> - Implement survival rate survey to find method of aquaculture techniques for improvement survival rate of juvenile anguillid eel. - The Aquaculture technique manual for improvement survival rate was compiled.
Activity 3	<ul style="list-style-type: none"> - To hold "Regional Meeting" to enhance resources management scheme of tropical anguillid eel in South east Asia. - To hold "Resources management workshop" to formulate resource management measure of tropical anguillid eel in AMSs. - To hold "Statistics /aquaculture workshop" to analyze collecting statistical data and aquaculture technique of tropical anguillid eel in AMSs.

3. Achievement and Outcomes/Outputs of Activity in overall project duration

Proposed Activity	Achievement and Outcomes/Outputs of Activity
Activity 1	<ul style="list-style-type: none"> - The status of utilization (catch, aquaculture) of anguillid eel resources in the ASEAN region is grasped by statistical survey. - To clarify trend and status of anguillid eel resources from catch data including fishing effort information. - To clarify population genetic structure of anguillid eel species at survey site in South Asia region by DNA analysis.
Activity 2	<ul style="list-style-type: none"> - Main factors that reduce the survival rate of juvenile eels are identified. - The technique to improve survival of juveniles anguillid eels were developed.
Activity 3	<ul style="list-style-type: none"> - Knowledge on tropical anguillid eel resource management was enhanced in AMSs. - Anguillid eel resource management policy in Southeast Asia for sustainable utilization was formulated.

4. Evaluation and major Impacts/Issues in the overall project duration

Results	Indicators		Reasons for deviations
	Planned	Achieved	
Objective: Resource management framework for sustainable anguillid eel fisheries in AMS is consolidated.	<ol style="list-style-type: none"> 1. Number of qualified experts has increased in each AMS; 2. Manuals on technologies/methodologies for sustainable eel fisheries/aquaculture are regionally available; 3. Regional rules on sustainable eel fisheries/aquaculture are compiled in a report 	<ol style="list-style-type: none"> 1. Number of experts has increased in AMS through this project activities. (Number of experts in charge of tropical anguillid eel, Cambodia 3 persons, Indonesia 3 persons, Myanmar 3 persons, Philippines 5 persons, Viet Nam member of Directorate fisheries) 2. Manuals and report on technologies/methodologies for sustainable eel fisheries/aquaculture created. 3. Regional rules (Policy guideline for conservation and management of tropical anguillid eel resources in southeast Asia) was formulated. 	
Output:1 The statistical data collection system is strengthened in AMS to better understand the present status and past/future trends on tropical anguillid eels at each species and stage.	Number of qualified staff for the statistical data collection has increased in each AMS.	The persons in charge of collecting statistical data on tropical anguillid eels in each AMS were decided.	Although the number of staff in the statistical survey was the same, it was important to identify the person in charge of statistics for tropical anguillid eels resource management.
Output:2 Tropical anguillid eel aquaculture technologies are improved in AMS.	<ol style="list-style-type: none"> 1. Main factors that reduce the survival rate of juvenile eels are identified and consolidated. 2. Improved technologies for higher survival of eel juveniles are identified. 3. The Aquaculture technique manual for improvement survival rate was compiled. 4. Staff in charge of eel aquaculture of all AMS understand the technologies .to improve survival rate of juvenile anguillid eel. 	<ol style="list-style-type: none"> 1. Main factors are identified (reference of Final report on page 61-91, and Manual of “Nursery Culture of Tropical Anguillid eels in Philippines”) 2. Improved technologies for higher survival of eel juveniles are identified (reference of Final report on page 61-91, and Manual of “Nursery Culture of Tropical Anguillid eels in Philippines”) 3. A manual was developed for improving eel farming technologies. 4. A manual of techniques for survival rate of juvenile anguillid eel submitted to AMS. 	

Results	Indicators		Reasons for deviations
	Planned	Achieved	
Output: 3 Knowledge on the methodologies for collecting statistical information and tropical anguillid eel resource management is enhanced at the central and regional level.	1. Methodologies on statistical information collection of tropical anguillid eels are better understood by government officials of AMS. 2. Knowledge on tropical anguillid eel resource management is enhanced among AMS	1. Through various activities of the project, the technology to collect statistical information on tropical anguillid eels by government officials of AMS has been improved. 2. Knowledge of resource management of tropical anguillid eel was strengthened, through various activities of the project.	

5. Publications and Others

List of completed publications	Type of media	Attached e-file
<ul style="list-style-type: none"> Status and Resources Management of Tropical Anguillid Eels in Southeast Asia 	Electronic data (On website of CTIES home page)	https://cites.org/sites/default/files/eng/com/ac/30/Inf/E-AC30-Inf-11.pdf
<ul style="list-style-type: none"> Nursery Culture of Tropical Anguillid Eels 	Publication	https://repository.seafdec.org.ph/handle/10862/48/recent-submissions
<ul style="list-style-type: none"> Report on “Enhancing sustainable utilization and management scheme of tropical Anguillid eel resources in Southeast Asia” 	Publication	http://repository.seafdec.org/handle/20.500.12066/5488
<ul style="list-style-type: none"> Video to introduce the project 	Posted on the SEAFDEC website	https://www.youtube.com/watch?v=iYvPOQ6py1A

PROJECT DOCUMENT

ACHIEVEMENT FOR YEAR 2019

Project id: 201706006			
Program Categories:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	SEADFEC-EU/CITES Sharks Project Phase II		
Program Strategy No.:	I	Total Duration:	2018-2019
Lead Department:	Secretariat	Lead Country:	Malaysia
Donor/Sponsor:	EU through CITES Secretariat	Total Donor Budget:	USD 90,000
Project Partner:	None	Budget for 2020:	USD 0
Project leader:	Worawit Wanchana	Involved Country:	Cambodia, Indonesia, Malaysia, Myanmar, Thailand, and Viet Nam

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

In Southeast Asia, the recent listing of commercially captured shark and ray species in the CITES Appendices has led to concerns about the difficulties in assessing the status of sharks stocks and in planning and implementing management measures for sharks. SEAFDEC was asked by its Member Countries to address such concerns. Moreover, sharks in Southeast Asia are considered as non-target catch. Even though the Southeast Asian waters have one of the richest elasmobranch diversity (sharks, rays, and skates), the status of these resources and their utilization are still largely underdetermined due to insufficient data on catch, landings at species level, and trade as well as limited information on biological parameters of many elasmobranch species. SEAFDEC has initiated regional activities to improve shark conservation/management in Southeast Asia.

In 2015, with the fund support from EU through CITES Secretariat, SEAFDEC carried out a one-year regional project on sharks and rays data collection in relevant countries of the ASEAN. The project consisted of: information compilation on sharks data collection; organization of workshops and training sessions on sharks species identification for enumerators; recording of landing data at species level; data validation, mid-term project evaluation; and final review of national and regional reports.

2. Background and Justification

Regional attempts have been made by SEAFDEC to assist the ASEAN Member States (AMSs) in improving the system of compiling their national statistics of sharks and rays through strengthening national expertise of the AMSs for identification and compilation of biological data on sharks and rays. Regional activities on sharks in Southeast Asia emphasizes on improvement of data and information collection for commercially exploited aquatic species of sharks, starting from a series of events since 2011. Previously, SEAFDEC had carried out in 2015 a one-year regional project on sharks and rays data collection in six (6) participating countries totally involving 13 landing sites of data collection with the funding support from EU through CITES Secretariat. The project started with preparation of the SOP for data collection on shark, and undertaking activities that include national workshops and training sessions on sharks and rays species identification for enumerators, recording of landing data at species level, validation of data, mid-term evaluation meeting for data collection, and final meeting to review the national report and finalize the regional report for the one-year regional project (2015 to 2016). Since the conduct of a regional study by SEAFDEC/MFRDMD in 2002, information on shark/ray landing in the region was successfully updated by the one-year data collection conducted during 2015 to 2016. The results from the one-year data collection in 2015 was very useful for the participating country including Thailand to finalize their first National Plan of Action on Conservation and Management of Sharks (Thailand NOPA-Shark), as well as to be use as a basis for the conduct of stock assessment study in Southeast Asian region.

Building upon the experiences and feedback from previous activities implemented during 2015 to 2016, the Phase II continues to support ASEAM Member States in fulfilling CITES provision for trade of commercially-aquatic species listed in Appendix II. This will be implemented in a targeted and needs-based manner. By assisting Parties of CITES who have more comprehensive data sets and information available for making the NDFs, the project will also help in establishing best practice examples for the region. Simultaneously, for those Parties in the region that have no or little available, because no or insufficient data has been collected on catches of CITES-listed sharks species, the project will support primary data collection to make sure that all Parties in the region are able to be robust NDFs in the future

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1 Improve national and regional statistics on shark landing	Outcome 1 National Statistic improvement on shark/ ray landing	Output 1.1 Increased the capacity of the local enumerators of 4 information-poor Parties of CITES for further improvement of the national statistics towards data availability for assessment of stock status of CITES listed shark species Output 1.2 Data sets from the results of the one-year data collection in the information-poor Parties	Activity 1.1 National workshops for training of local enumerators for 4 information-poor Parties (Cambodia, Myanmar, Philippines, and Viet Nam) Activity 1.2 One-year collection at selected landing sites of the information-poor Parties (Cambodia and Myanmar)
Objective 2 Develop regional reference for supporting development of shark NDF	Outcome 2 Regional references for development of national NDF	Output 2 Report of the national workshop to support development of national NDF for 3 Parties	Activities 2 National workshops to support development of national NDF for 3 Parties (Malaysia, Indonesia, and Thailand)
Objective 3 Disseminate one-year shark data collection at regional and international fora (e.g. CITES CoP18 side event, regional meeting, etc)	Outcome 3.1 Exchange information with other ASEN Member States, as well as with other countries at the CITES CoP18 Outcome 3.2 Regional references on shark landing data in Southeast Asia	Output 3.1 Dissemination of preliminary result from the one-year data collection on shark landing in the region Output 3.2 Terminal report of project	Activity 3.1 Participation of project staff at CITES CoP18 Activity 3.2 Development of project report to be submitted to CITES Secretariat

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1.1 National workshops for training of local enumerators for 4 information-poor Parties (Cambodia, Myanmar, Philippines, and Viet Nam)	The national workshops will be organized to initiate the process for continuing one-year data collection of the support from the project to information-poor Parties (Cambodia, Myanmar, Philippines, and Viet Nam). The workshop also aims to disseminate the data set from the previous project support data collection during 2015 to 2016 in 6 participating countries (Cambodia, Indonesia, Malaysia, Myanmar, Thailand, and Viet Nam)

Activity	Description
Activity 1.2 One-year collection at selected landing sites of the information-poor Parties (Cambodia and Myanmar)	This activity supports the information-poor Parties (Cambodia and Myanmar) to collect shark landing data at species level in selected landing sites. It is envisaged that the countries can use the result as a basis for continuing their respective efforts for improvement of data collection on shark landing by recording at species level. And at the same time, capacity of the fisheries officials responsible for collecting landing data on shark can be enhanced. Validation of the data collected by the participating countries will be made by the technical experts of SEAFDEC MFRDMD and TD.
Activities 2 National workshops to support development of national NDF for 3 Parties (Malaysia, Indonesia, and Thailand)	In order to have regional references on development of shark NDF, successful case or experience based on national initiatives to develop a species specific NDF can be documented and packaged and further shared with other AMSs.
Activity 3.1 Participation of project staff at CITES CoP18	Results from data collection and experiences on development of shark NDF in Southeast Asian region can be shared at international fora and regional events.
Activity 3.2 Development of project report to be submitted to CITES Secretariat	Project staff will prepare the reports submitting to the CITES Secretariat as required under the LOA.

3.3 Activity, Sub-activity and Proposed Budget

(Unit: USD)

Activity	Sub-Activity	2018	2019
Activity 1	Activity 1.1	20,000	8,000
	Activity 1.2	9,000	9,000
Activity 2	Activity 2		20,000
Activity 3	Activity 3.1		24,000
	Activity 3.2		0
Activity 4			8,000
Sub-Total Budget		29,000	61,000

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

The key achievements of the project implementation during the year 2019 include:

1. Organization of the National Workshop and Training on Sharks Data Collection for Local Enumerators

In early 2019 the workshop/training was organized by the project in close collaboration with the Philippine Bureau of Fisheries and Aquatic Resources (BFAR), and was attended by 33 participants and observers including 17 BFAR Enumerators from the whole Region VI (Western Visayas) of the Philippines which the Provinces of Iloilo, Antique, Aklan, Capiz, Guimaras, and Negros Occidentia. Officers from BFAR-VI as well as from the National Fisheries Resource and Development Institute (NFRDI) of BFAR, representatives from the private sector, and resource persons from SEAFDEC TD and MFRDMD. The chosen venue was crucial for the Training because Region VI (Western Visayas) of the Philippines is surrounded by productive fishing grounds, of which the Visayan Sea and Guimaras Strait are known fishing grounds for sharks and rays species. Moreover, BFAR records also show a long-term series of catch landings for sharks and rays in Western Visayas, but the veracity of the taxonomic identification in terms of species classification of such landings is still not certain due to the inadequacy of the needed expertise. The Training was important for field enumerators of the Philippines, especially those coming from the Western Visayas, in order that the data on sharks and rays could be reported not only in terms of volume of catch but also classified in terms of species. The Training also facilitated the compilation of biological information as well as the catch and effort of the sharks and rays landings, necessary to determine the stock status of certain targeted sharks and rays species. The said information would provide

the necessary inputs for the establishment of the country's non-detriment findings (NDF) for sharks and rays species, where catch, trade and utilization data are not properly documented and/or reported.

2. Organization of National Workshops on CITES Listed Non-Detriment Findings Document

A series of the national workshop on CITES Listed Non-Detriment Finding Document were organized for Thailand (18-19 July 2019, Samut Prakarn, Thailand), Malaysia (6-7 August 2019, Tawau, Malaysia), and Indonesia (18 September 2019, Jakarta, Indonesia). The workshops aimed at supporting information exchange and learning in making of Non-Detriment Finding (NDF), pursuant to CITES Decision 17.212 of the Convention. Additionally, the workshops also raised awareness and built capacity of competent authorities of their respective countries (Scientific and Management Authorities of CITES, and other key stakeholders). Experiences and lessons learnt and to be learned from various expertise not only from SEAFDEC but also from the national authorities in terms of making NDFs, were discussed during the workshops. Available information documented during the workshop will be disseminated/shared with other AMS.

3. Participation of SEAFDEC staff to CITES-CoP18

On 18 August 2019, SEAFDEC organized the side event "SEAFDEC Experiences on Sharks" during the CoP18 of CITES in Geneva to disseminate the experiences of SEAFDEC and the lessons learnt on the conservation and management of sharks in the Southeast Asian region. Focusing on capacity building, the programs of activities spearheaded by SEAFDEC in collaboration with international and national organizations as well as the SEAFDEC Member Countries include improvement of data collection on sharks, technical support on the implementation of NPOA-Sharks, and assistance for the development of Non-detrimental Findings on sharks.

The speaker from SEAFDEC Secretariat, the Policy and Program Coordinator, *Dr. Worawit Wanchana* was supported by the Senior Fisheries Officer and Head of the Marine Resource Management Office, CITES and Conservation of Endangered Species Unit of the Department of Fisheries Sabah in Malaysia, *Mr. Lawrence Kissol, Jr.* in sharing the experiences of the Southeast Asian countries on the conservation and management of sharks.

It was very noticeable during the Side Event that strong support was expressed by the audience of CoP18 Parties including the observers, on the initiatives of the Southeast Asian countries in promoting the conservation and management of sharks. The more than 70 participants attending the Side Event congratulated SEAFDEC for carrying out a number of activities over a decade with technical support from FAO Rome Headquarters and Malaysia-based SEAFDEC Marine Fishery Resources Development and Management Department. For its part, SEAFDEC is very thankful to the donors for providing financial support that enabled SEAFDEC to implement the shark programs, including the Japanese Trust Fund for SEAFDEC through the Fisheries Agency of the Government of Japan and the EU-CITES sharks program, among others. The expert from FAO Rome Headquarters who attended the Side Event congratulated SEAFDEC for fully utilizing the existing expertise on sharks and for developing effective manual and training packages in its capacity building activities for the benefit of the ASEAN Member States.

4. Organization of Workshop for Validating Data Collected by the Project Participating Countries

A workshop was organized by the project to validate 1-year shark landing data collected by Cambodia and Myanmar from September 2018 to August 2019 using funding support from the project. The National Focal Point of the Project and two local enumerators for 1-year data collection attended the workshop. SEAFDEC resource persons from MFRDMD and TD provided technical assistance to validate the data during the workshop. It was scheduled that the results from 1-year data collection will be submitted to the project by the first week of November 2019.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1					
Activity 1.1 National workshops for training of local enumerators: Philippines		17 (9)	4(1)	5(2)	4,000
Activity 2 National workshops to support development of national NDF for 3 Parties					20,000
Thailand (18-19 July 2019, Samut Prakarn, Thailand)		26(16)	5(1)	-	
Malaysia (6-7 August 2019, Tawau, Malaysia)		13(5)	7(1)		
Indonesia (18 September 2019, Jakarta, Indonesia)		47(24)	6(2)		
Activity 3 Participation of project staff at CITES CoP18			2(1)		10,000
Activity 4 Organization of workshop for validation of 1-year shark landing data in the participating countries					

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Data Collection by the Participating Countries	<ul style="list-style-type: none"> - Capacity built for local enumerators of the participating countries - Data set of 1-year shark landing data collection in the selected landing sites in the participating countries - Reports of the 1-year shark landing data 	<ul style="list-style-type: none"> - National Workshops for information-poor countries (Cambodia, Myanmar, Philippines, and Viet Nam) conducted. - Report of One-year shark data collection 2018 to 2019 in the project participating countries (Cambodia and Myanmar)
Organization of National Workshops on CITES Listed Non-Detriment Findings (NDF)	<ul style="list-style-type: none"> - Capacity built of the national authorities in developing NDF for marine species 	Reports of the National Workshops conducted for Malaysia, Indonesia, and Thailand.
Organization of Workshop for Validating Data Collected by the Project Participating Countries	<ul style="list-style-type: none"> Validation of the 1-year shark landing data collected 	Report of One-year shark data collection 2018 to 2019 in the project participating countries (Cambodia and Myanmar)

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
Report of 1-year shark landing data collection	electronic	
Report of the NDF Workshops	electronic	
Terminal report of the project	electronic	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Data Collection by the Participating Countries	<ul style="list-style-type: none"> - Data set can be used and merged with the previous year data collected in their respective countries for better understanding of stock condition of shark/ ray - Need more capacity building program for local enumerators
Organization of National Workshops on CITES Listed Non-Detriment Findings (NDF)	<ul style="list-style-type: none"> - Useful in terms of exchanging/ updating information regarding the requirements of making NDF for CITES Listed marine species
Organization of Workshop for Validating Data Collected by the Project Participating Countries	<ul style="list-style-type: none"> - Useful for the countries as they are having less experience not only in species identification, but also the use of pivot table for making the full report.

PROJECT DOCUMENT
Achievement for Year 2019
AND
Proposed Activities for the Year 2020

			Project ID: 201706006
Program Category:	ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Strengthening the Effective Management of Inland Fisheries and Aquaculture in AMS with GIS and RS Technology		
Program Strategy No.:	I	Total Period:	January 2019 - June 2020
Lead Department:	Secretariat	Lead Country:	Thailand
Donor/Sponsor:	Japanese ASEAN Integration Fund (JAIF)	Total Donor Budget:	USD 279,960
Project Partner:	None	Budget for January 2019- June 2020:	USD 279,960
Lead Technical Officer:	Isao koya, Assistant Project Manager for the JTF	Project Participating Country(ies):	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

Inland fisheries and freshwater aquacultures in the Southeast Asia region as major fish producers have provided various kinds of fish products to the world-wide markets. In Southeast Asia, the inland fishery and aquaculture are important field, which have much production volume compared to other areas.

On the other hand, inland fishery resources are particularly susceptible to the influence of environmental factors such as rainfall and water temperature and catch pressure by fishery. compared to the marine fisheries.

As a result, this has often impeded the appropriate fisheries and aquaculture management measures and guidance for the fishers and farmers by the governments, which often causes seasonal overfishing, excess production, price fluctuation and low-valued fish production. In order to manage and use inland fishery resources, information on the environmental change of habitats affecting resources is necessary. However, such information is currently not sufficiently obtained. Using the Geographic Information System (GIS) and Remote Sensing (RS) technology, it became possible to grasp the environmental changes of environmental factor in the habitats of aquatic organisms affecting of inland fishery resources.

Considering those issues on inland fisheries and aquacultures, this project aims to map inland fishery and aquaculture sites in AMSs using GIS & RS technology, and proposes monitoring methodologies using GIS Mapping in order to enable government of AMSs to contribute in the effective management of inland fisheries and aquaculture with GIS & RS technology in AMSs. The project is going to be implemented GIS (Geographic information system) & RS (Remote sensing) by Southeast Asian Fisheries Development Center (SEAFDEC) for a period of one year.

2. Background and Justification

2.1 Current Problem

Inland fishery resources are greatly affected by changes in the environment. For example, the catch of the inland fluctuates greatly depending on the extent of expansion and contraction of river and lake areas due to precipitation in the rainy season and dry season.

Also, inland fisheries resources are susceptible to environmental fluctuations and catch pressure because the area of the fishing ground is limited. It is necessary to manage the inland fisheries resources and to use them sustainably while taking environmental factors into consideration. However, management methods

considering environmental factors have not been established. If the environmental factor mechanism that affects the inland fisheries resources is grasped by GIS/RS, the method of inland fisheries resource management will be newly presented. GIS Mapping, R/S technology is a method that can be used anywhere in AMSs.

2.2 Rationality

In Southeast Asia, the inland fishery and aquaculture are important field, which have much production volume compared to other areas. On the other hand, inland fishery resources are affected by environmental factors.

Several countries that are particularly active in the field of inland fishery among AMSs are selected as pilot site target countries and establish monitoring methods RS using GIS Mapping technology. The method will be disseminated to each AMSs.

2.3 Project History

No project on management scheme with GIS&RS technology of inland fishery and aquaculture has been implemented.

2.4 Beneficiaries

The relationship between catch and environmental data such as rainfall, area of inland fishing ground, temperature, etc. will become clear by using the GIS Mapping/RS technology. By doing so, we will be able to predict the catch amount to some extent. As a result, after the project is over, the fishers/farmers can obtain the environmental information affecting the catch by GIS Mapping/RS technology, and it becomes possible to obtain benefits indirectly that can continue to use fisheries resources effectively. In addition, government officials can learn techniques related to fishery resources management by acquiring GIS Mapping/RS technology during project implementation. This project will therefore allow AMS to obtain all of the required data and information, such as long-term catch data, precise distributions and diversity, and reliable trade data of each of the tropical anguillid eel species. With these data and information, AMS will be able to estimate, for instance, the allowable catch limit to secure the sustainable use of tropical anguillid eel resources.

3. Gender Sensitivity of the Project

The project is not gender-sensitive but neutral and equalized. Both male and female can participate in all the proposed activities.

4. Project Goal, Outputs, Activities, Indicators and Verification:

4.1 Logical Framework

GOAL (Overall Objectives)		
This project aims to contribute in the effective management of inland fisheries and aquaculture in AMSs countries through the promotion of GIS Mapping/RS technology. Using the GIS Mapping technique, the causal relation between the catch amount and the environmental data by the satellite on the R/S is clarified.		
OUTPUT 1	Indicator (to measure the project's achievements)	Means of Verification
Output 1: The geographical and environmental data on satellites and the catch data from the fishing ground in inland water of target sites in AMS are analyzed by GIS Mapping technology, and guideline of analytical method is created.	Indicator1.1: To clarify the relationship between graphical/environmental data by remote sensing and catch data on the fishing ground by GIS Mapping and multivariate analysis. Indicator1.2: The monitoring method for inland fisheries resources management by GIS Mapping /RS technology is proposed and guideline of analytical method is created.	Means of Verification 1.1 Whether the guideline of monitoring method is prepared or not. 1.2 An index value indicating the relationship between the environmental data and catch data by GIS Mapping and multivariate analysis is indicated. 1.3 Whether the guideline of monitoring method is prepared or not.

ACTIVITY 1		
1.1: Data of catch amount by fishing ground necessary for GIS Mapping analysis at project sites (The planned countries as project sites: Cambodia, Indonesia, Lao PDR, Myanmar, Thailand) are collected and compiled. 1.2: Environmental data on the geographical and inland water aquatic organism habitats based on satellite images for each target site of AMS are collected and compiled. 1.3: The relation among geographical/environmental data (Inland water area, precipitation amount, temperature etc.) based on satellites and the catch data from the fishing ground of target sites of AMS are analyzed and clarified with multivariate analysis by GIS Mapping technology.		
OUTPUT 2	Indicator (to measure the project's achievements)	Means of Verification
Output 2: Dissemination of the monitoring and analyzing GIS Mapping /RS technical methods on geographical /environmental data and catch amount data in AMS.	Indicator 2.1: A technical manual on analysis methods using GIS Mapping technology is produced. Indicator 2.2: The number of staffs who can analyze using GIS Mapping / RS technology increases in AMSs countries	Means of Verification 2: Technical manual on analysis methods using GIS Mapping technology The number of staff who can analyse using GIS Mapping / RS technology in target AMS
ACTIVITY 2		
Activity 2 Technical analysis method of GIS Mapping / RS to clarify the relationship between geographical/environmental data and catch data is disseminated to AMSs. 2.1: To summarize the result of catch monitoring method using GIS Mapping/RS technology obtained through activity 1. 2.2: To create technical manual on analysis methods using GIS Mapping technology. 2.3: To hold the workshop on catch analysis using GIS Mapping /RS technology for disseminating technology to AMSs.		

4.2 Project Implementation Plan for 2019 - 2020

Activities	2019				2020	
	1	2	3	4	1	2
Activity 1.1						
Activity 1.2						
Activity 1.3						
Activity 2.1						
Activity 2.2						
Activity 2.3						

4.3 Proposed Budget for 2019 – 2020

(Unit: USD)

Output	Activities	Year 1 (2019)	Year 2 (2020)	Total
Output 1	Activity 1.1	71,249	71,500	142,749
	Activity 1.2	9,095	5,800	14,895
	Activity 1.3	7,840	15,700	23,540
Output 2	Activity 2.1		4,950	4,950
	Activity 2.2		29,570	29,570
	Activity 2.3		30,405	30,405
Project budget Sub-Total		88,184	157,925	246,109
Other budget (management cost and contingency fee)				33,851

PART II: PROJECT ACHIEVEMENTS IN 2019

1. Project Achievements in the Present Year (2019)

The achievement of the project in 2019 is as follows.

Collection of catch data

A system for collecting catch data from fishermen could be constructed at five sites in five AMS countries.

Collection of environmental data by satellites

A method for collecting environmental data (Inland waters area, Temperature of water surface, Rain fall, chlorophyll) by satellites has been established at five sites in five AMS countries, and work to collect the data is underway. It is necessary to correct the satellite data using the data actually measured at the site.

Data analysis

An analysis of the relationship between catch data and environmental data has been started and will be continued next year.

Summary of analysis results, manuals, and report creation

Preparations for the compilation of analysis results have been started and will be continued next year.

2. Activities and Budget in the Present Year

Activities	Type of activity	Number of Participants			Budget Spent (USD)
		AMSs	SEAFDEC	Others	
Output 1:					
Activity 1.1	Survey/Meeting	11 (3)	15 (5)	114 (17)	71,249
Activity 1.2	Survey/Meeting	15 (1)	42 (10)	16 (2)	9,095
Activity 1.3	Analysis		2 (1)	3	7,840
Output 2:					
Activity 2.1	Analysis	This activity was not implemented in 2019			
Activity 2.2	Creating manual	This activity was not implemented in 2019			
Activity 2.3	Work shop	This activity was not implemented in 2019			

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Expected Outcome/Outputs and Achievements

Activities	Expected Outcome/Outputs	Results/Achievements
Output 1:		
Activity 1.1	Data of catch amount by fishing ground necessary for GIS Mapping analysis at project sites are collected and compiled	A system for collecting catch data from fishermen at five sites in five AMS countries could be constructed.
Activity 1.2	Environmental data on the geographical and inland water aquatic organism habitats based on satellite images for each target site of AMS are collected and compiled	A method for collecting environmental data (Inland waters area, Temperature of water surface, Rain fall, chlorophyll) by satellites has been established.
Activity 1.3	The relation among geographical/environmental data (Inland water area, precipitation amount, temperature etc.) based on satellites and the catch data from the fishing ground of target sites of AMS	An analysis of the relationship between catch data and environmental data has been started and will be continued next year.

Activities	Expected Outcome/Outputs	Results/Achievements
	are analyzed and clarified with multivariate analysis by GIS Mapping technology	

Output 2:		
Activity 2.1	This activity was not implemented in 2019	
Activity 2.2	This activity was not implemented in 2019	
Activity 2.3	This activity was not implemented in 2019	

4. List of Publications in 2019

Publications	Type of Media	Attached e-file
There was no publication		

5. Evaluation on Workshops/Training Courses by Participants of AMSs

Activities	Evaluation
Output 1:	
Activity 1.1	A system to collect inland water catch data at 5 sites in 5 countries of AMS was established. Catch data was collected.
Activity 1.2	Technique to download environmental data from satellites and collect data was acquired. Environmental data was collected.
Activity 1.3	Work to analyze the relationship between catch data and environmental data has started specifically.
Output 2:	
Activity 2.1	This activity was not implemented in 2019
Activity 2.2	This activity was not implemented in 2019
Activity 2.3	This activity was not implemented in 2019

6. Major Impacts and Issues

In the 2019 project activities, a system to collect data from fishermen could be established at five inland water sites in five AMS countries. This collecting data system is that a fisherman record the daily catch on a sheet, and the enumerator collects the catch sheet from each fisherman. However, there are a variety of inland fisheries and types of fishing gear, and it is necessary to identify the fishing gear and give it a common name of Southeast Asia, but the classification work has not yet been completed. In 2020, it will be necessary to identify and classify common names of fishing gear.

The problem with environmental data collection by satellites is that satellite data cannot be collected every day. This is because in Southeast Asia, there are many cloudy days in the rainy season, and optical data cannot be obtained on cloudy days. As a result, a sufficient amount of data required for analysis cannot be collected in a one-year period. It is necessary to complement the collected data using past satellite data.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, the following activities will be carried out in the project.

Collection of catch data, creation of database

Review the contents of the catch data recorded by fishermen at five sites in five AMS countries, and input the data into Excel to create a database.

Collection of environmental data by satellite and creation of database

Collect environmental data (site area, water temperature, rainfall, chlorophyll) in 5 sites and create a database.

In order to verify the environmental data by satellites, actual measurement data will be collected and the satellite data will be corrected based on the actual measurement values.

Analysis of the relationship between catch data and environmental data

Analyzes collected catch and environmental data using mathematical and GIS mapping / remote sensing techniques to clarify relationships. The analysis results will be edited and compiled.

Preparation of analysis manual and final report

Create a technical manual that shows how to analyze using GIS mapping/Remote sensing technology. The final report will be created.

Hold workshop to disseminate analytical methods

Workshops on analytical methods using GIS mapping/Remote sensing technology will be held to disseminate the technique to AMS.

2. Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Output 1	The geographical and environmental data on satellites and the catch data from the fishing ground in inland water of target sites in AMS are analyzed by GIS Mapping technology, and guideline of analytical method is created.	
Activity 1.1	Data of catch amount by fishing ground necessary for GIS Mapping analysis at project sites (The planned countries as project sites: Cambodia, Indonesia, Lao PDR, Thailand) are collected and compiled <i>Estimated expenditures:</i>	71,500
	<ul style="list-style-type: none"> • <i>Reward for fishermen to collect data</i> = US\$ 27,000 • <i>Travel cost</i> = US\$ 15,000 • <i>Daily subsistence allowance</i> = US\$ 12,500 • <i>Accommodation</i> = US\$ 9,000 • <i>Hare /Rental Others</i> = US\$ 8,000 	
Activity 1.2	Environmental data on the geographical and inland water aquatic organism habitats based on satellite images for each target site of AMS are collected and compiled <i>Estimated expenditures:</i> <i>Consultant fee for collecting data by satellite</i> US\$ 5,800	5,800
Activity 1.3	The relation among geographical/environmental data (Inland water area, precipitation amount, temperature etc.) based on satellites and the catch data from the fishing ground of target sites of AMS are analyzed and clarified with multivariate analysis by GIS Mapping technology <i>Estimated expenditures:</i> <i>Consultant fee for analysis between catch data and environmental data</i> =US\$6,000 <i>Working group meeting</i> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 4,000 • <i>Daily subsistence allowance</i> = US\$ 2,000 • <i>Accommodation</i> = US\$ 1,500 • <i>Meeting package</i> = US\$ 1,500 • <i>Others</i> = US\$ 700 	15,700
Output 2		
Activity 2.1	To summarize the result of catch monitoring method using GIS Mapping/RS technology obtained through activity 1. <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Report of analysis making</i> =US\$ 1,200 • <i>Technical Manual Making</i> =US\$ 2,250 • <i>Consumable</i> =US\$ 1,500 	4,950

Proposed Activities	Descriptions	Proposed Budget
Activity 2.2	To create technical manual on analysis methods using GIS Mapping technology. <i>Estimated expenditures:</i> <i>Analysis result report meeting (2 times)</i> <i>Cost of times</i> <ul style="list-style-type: none"> • <i>Travel cost</i> = US\$ 5,000 • <i>Daily subsistence allowance</i> = US\$ 4,100 • <i>Accommodation</i> = US\$ 3,000 • <i>Hare/Rental Others</i> = US\$ 2,700 <li style="text-align: right;"><i>Sub total</i> = US\$ 14,800 	2,9750
Activity 2.3	To hold the workshop on the catch analysis using GIS Mapping /RS technology for disseminating technology to AMSs. <i>Estimated expenditures:</i> <i>Analysis result report meeting (2 times)</i> <i>Workshop for disseminating GIS mapping /RS technology</i> <ul style="list-style-type: none"> • <i>Travel cost</i> = US\$ 6,000 • <i>Daily subsistence allowance</i> = US\$ 3,000 • <i>Accommodation</i> = US\$ 3,000 • <i>Meeting package</i> = US\$ 2,000 • <i>Others</i> = US\$ 1,200 <li style="text-align: right;"><i>Sub total</i> =15,200(2times) = US\$ 30,405 	30,405

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun
Output 1:						
Activity 1.1						
Activity 1.2						
Activity 1.3						
Output 2:						
Activity 2.1						
Activity 2.2						
Activity 2.3						

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Activity 1.	
Activity 1.1. Data of catching amount by fishing ground necessary for GIS mapping analysis at project sites in AMS are collected and compiled	<ul style="list-style-type: none"> • To collect catch data by fishing ground in catching areas of fisheries resources in target sites of each country. The fisheries data index CPUA (catch per unit area) will be designed such as catch amount, fisheries type, number of fishing operation, which can help to get enough raw data for research. • To process and compile the catch amount data from the fishing ground in target sites of AMS, Digitization work will be done to store the collected data in the database. A certain method will be applied to remove the wrong data.

Planned activity	Expected Activity Results
<p>Activity 1.2. Environmental data on the geographical and inland water aquatic organism habitats based on satellite images for each target site of AMS are collected and compiled</p>	<ul style="list-style-type: none"> • To analyze which satellite sources can provide the suitable and reliable geographical/environmental data on the target fisheries area, and collect them, where a series of necessary index will be predefined such as land surface temperature, water area, phytoplankton abundance (chlorophyll-a), rain fall, etc. • To process and compile the geographical and environmental data based on satellites. If possible, the data in recent several years will be processed and stored so as to analyze the development trend by satellite of the target site of each country
<p>Activity 1.3 To clarify the illation among geographical/environmental data based on satellites and the catch data from the fishing ground of target sites of AMS are analyzed and clarified with multivariate analysis by GIS mapping technology</p>	<ul style="list-style-type: none"> • To analyze all the collected data in target sites of each country by various GIS mapping and analysis technologies • To consider the suitable catch monitoring method with multivariate analysis using GIS mapping technology.
<p>Activity 2.</p>	
<p>Activity 2.1. To summarize the result of catch monitoring method using GIS Mapping/RS technology obtained through activity 1.</p>	<ul style="list-style-type: none"> • Catch data and satellite environmental data collected at five sites are analyzed and compiled the results.
<p>Activity 2.2 To create technical manual on analysis methods using GIS Mapping technology.</p>	<ul style="list-style-type: none"> • Manuals on technical methods for analyzing catch and environmental data will be prepared.
<p>Activity 2.3 To hold the workshop on catch analysis using GIS mapping /RS technology.</p>	<ul style="list-style-type: none"> • Analytical techniques using GIS mapping technology will be disseminated to AMS through workshop.

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

			Project ID: 201503002
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources		
Program Strategy No. :	II	Total Duration:	2015 - 2019
Lead Department:	Aquaculture Department (AQD)	Lead Country:	Philippines
Donor/Sponsor:	Japanese Trust Funds (JTF)	Total Donor Budget:	USD 417,420
Project Partner:	None	Budget for 2019:	USD 64,540
Project Leader:	Koh-ichiro Mori / AQD	Project Participating Country (ies) :	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

The Project titled “Environment-friendly, sustainable utilization and management of fisheries and aquaculture resources” was proposed to:

1) Establish environment-friendly, responsible aquaculture technology

Nature-conscious culture technologies guaranteeing environment-friendliness.

- Use of plant-origin feed ingredients that are available in the region will be explored in the development and/or refinement of aquafeed for cultured freshwater fish species such as tilapia
- Ecosystem-based pond management strategies will be developed using shrimp, mud crab, milkfish, etc. as the target culture species through aquasilviculture.

2) Promote community-based production and resource enhancement of high-value aquatic resources

- Community-based integrated production of abalone *Haliotis asinina* and sea cucumber *Holothuria scabra* through culture, sea ranching and stock enhancement is proposed for low-income households who live in environments without electricity but with natural food for abalones and sea cucumbers. Seeds will be produced in small-scale solar-powered hatchery.
- Development of technologies on appropriate transport and acclimation strategies of seahorses from the hatchery to the release site; to determine the appropriate size of seahorses for release as well as the appropriate time of release; to develop appropriate monitoring strategies of the released seahorses; and to establish a community-based hatchery for seahorses.

3) Disseminate and demonstrate resource enhancement practices.

- Extension and demonstration for the breeding, hatchery seed production, nutrition and health management in grouper, sea bass, snapper, etc. through training program. Special training focusing on the culture of important fisheries commodities such as giant freshwater prawn, cat fish, big head carp.

2. Background and Justification

Among increasing demand for food due to rapid increase of world population, aquatic food production has been increasing steadily (FAO, 2012). However, capture production has attained the saturation levels and been stagnated since mid-1990s, and this shows that the importance of aquaculture is ever growing in these decades and in the future. In 2010, 47 % of the total production was supported by culture production. Nowadays, culture production in Asia accounts for 91.5 % of the world production. In 2010, four SEAFDEC Member Countries (MCs), which is, Indonesia, Viet Nam, Philippines, and Thailand, were included in the top ten countries in the world. Indeed, the remarkable increase in aquaculture was more pronounced in the Southeast Asian region compared to the world as shown in the increase of culture production in 2010 compared to that in 2001, showing 3.52 versus 1.78 times, respectively.

On the other hand, the rapid growth in aquaculture also brought negative impacts into our region such as: degradation of the culture sites, destruction of sensitive ecosystems, decrease in bio-diversity, spread of diseases, social conflicts, etc. All of them hinder sustainability of the aquatic food production. Majority of the repercussions which affect not only stabilities of culture production but also stock levels of wild aquatic species, particularly, have been amplified by paucities of consideration on impact of intense anthropological pressures on natural environments and resources, which also preclude efforts towards food security and poverty alleviation in the region. These undesirable ramifications would not happen if the responsible utilization and management were correctly and appropriately practiced.

Among the countermeasures to address the environmental and social issues arising from fisheries and aquaculture practices, active approaches for establishment of environment-friendly culture technologies, promotion of community-based management of aquatic resources and replenishment of endangered species are becoming increasingly significant to secure the sustainable utilization and management of aquatic species in our region. So far, the Aquaculture Department of Southeast Asian Fisheries Development Center (SEAFDEC/AQD) has acquired useful information and developed skills especially in the fields of feed development, culture technology with mangrove forests, and community-based management for aquatic species production under the regional program "Promotion of sustainable aquaculture and resource enhancement in Southeast Asia" funded by the Government of Japan Trust Fund-V (JTF5) in 2010-2014. However, the said activities should be further strengthened so that the sustainable utilization and management of aquatic resources will be accomplished in responsible manners in the Southeast Asian region. Varieties of endeavour to diminish or take away the negative factors are also required at once in such activities. On the other hand, approaches towards issues on the internationally over-exploited species are still primitive and should be firmly addressed. Particularly, to be correctly justified with the international trade regulations, we need to hurry to establish management protocols and technologies to secure the sustainable utilization under the appropriate conservation.

SEAFDEC has continuously been trying to contribute to food security and poverty alleviation. Environment-friendly, sustainable utilization and management of aquatic resources would be the just wholesome practices towards these goals.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To establish environment-friendly, responsible aquaculture technology	Outcome 1: Use of plant-origin feed ingredients that are available in the region for cultured freshwater fish species such as tilapia. Promoting the aquasilviculture of shrimp as an ecosystem based management strategy	Output 1: Exploration of plant-origin feed ingredients that are available in the region for cultured freshwater fish species such as tilapia. Establishment of ecosystem-based pond management strategies for increased production in ASEAN Member States.	Activity 1: Establishment of environment-friendly, responsible aquaculture technology <ul style="list-style-type: none"> The replacement of fishmeal as the main source of protein in feeds that will further improve production traits of tilapia. Test of refined formulated diets in cages and pond culture systems using improved feeding management scheme Determination of; 1) the time required for a mangrove habitat to remove nutrients (<i>i.e.</i> N, P) from shrimp farm effluents, 2) appropriate pond to mangrove area ratio that will efficiently remove nutrients from shrimp pond effluent, and 3) factors affecting mangrove efficiency to remove nutrients (<i>i.e.</i> surface area mangrove species, bark, leaf litter, etc.).
Objective 2: To promote community-based production and resource enhancement of high-value aquatic resources to secure the livelihood with avoiding rampant, illegal fishing and social conflicts.	Outcome 2: Promotion for the community-based production and resource enhancement of high-value aquatic resources	Output 2: Improvement of organizational, management and entrepreneurial skills of fisherfolks to sustain livelihoods from production, sea ranching and stock enhancement high-value aquatic products. Involvement of the community in the management of the natural resources by disseminating information and participating in the protection and conservation of the coral and sea grass areas which are the natural habitat of seahorses	Activity 2: Promote community-based production and resource enhancement of high-value aquatic resources <ul style="list-style-type: none"> Sustain the productivity of community-based integrated production abalones and sea cucumbers in the stock enhancement site and surrounding fishing grounds through effective fisheries governance. Production of juveniles for release from a small-scale solar-powered hatchery operated by fisherfolks. Promote replication of CBRE in other similar site in the Philippines and other appropriate sites. Development of technologies on appropriate transport and acclimation strategies of seahorses from the hatchery to the release site; to determine the appropriate size of seahorses for release as well as the appropriate time of release; and to develop appropriate monitoring strategies of the released seahorses; and to establish a community-based seahorse hatchery in the pilot site.

Objective	Outcomes	Outputs	Activities
Objective 3: To extend and demonstrate aquaculture technologies to member countries.	Outcome 2: Extending the technologies to rural Member Countries to hasten economic development in the region.	Output 3: Extension of technologies to rural Member Countries to hasten economic development in the region.	Activity 3: Technology and information transfer on resource enhancement practice through training. <ul style="list-style-type: none"> • Extension and demonstration for the breeding, hatchery seed production, nutrition and health management in grouper, seabass, snapper etc. through training program. • Special training focusing on the culture of important fisheries commodities such as giant freshwater prawn, cat fish, big head carp.

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Establishment of environment-friendly, responsible aquaculture technology	<p>Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits</p> <p>Use of plant-origin feed ingredients that are available in the region will be explored in the development and/or refinement of aquafeed for cultured freshwater fish species such as tilapia. Activities are geared toward the replacement of fishmeal as the main source of protein in feeds that will further improve production traits of tilapia.</p> <p>Sub-activity 1.2 Responsible aquaculture through aquasilviculture</p> <p>Aquasilviculture as an ecosystem-based pond management strategy will be investigated. Micro-organisms present in the mangrove forest has the ability to transform nutrients to bioavailable form that can be eaten by microorganisms lower in the food web which in turn can serve as food to organisms higher in the food web like the crabs. This process of transformation also improves water quality. The ability of mangroves to improve water quality is affected by the mangrove to pond area ratio (MPR). This study aims to establish the duration for a mangrove habitat to remove nutrients from shrimp pond including other factors that might affect its efficiency</p>
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources	<p>Sub-activity 2.1 Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement</p> <p>Sea cucumber or sandfish are detritus feeders in intertidal flats and reef areas that help aerate marine sediments and recycle nutrients necessary for maintaining marine ecosystems. Donkey ear abalones are gastropods that feed on encrusting algae and micro-particulates in coralline areas. Households in coastal and island communities earn income from selling these high-value export commodities. These species have become overexploited. Community-based integrated production of these species through culture, sea ranching and stock enhancement is proposed for low-income households who live in environments without electricity but with natural food for abalones and sea cucumbers. Thus, seeds will be produced in small-scale solar-powered hatchery. This project aims to maintain the health of the intertidal and reef environment through production systems that use hatchery-bred seeds produced from local broodstocks and grown with natural food while providing sustainable sources of income for coastal dwellers in remote island communities and improve governance of coastal resources in the Philippines and similar areas in Member Countries in Southeast Asia.</p>

Activity	Description
	<p>Sub-activity 2.2 Promotion of resource enhancement of seahorses</p> <p>Seahorses, which are highly exploited for their high price, were among the first marine fishes of commercial importance to be listed in the International Union for Conservation of Nature (IUCN) and all seahorses (genus <i>Hippocampus</i>) are listed the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) Appendix II effective May 15, 2004. Seed production technology in seahorses is expected to provide the needed seed for the resource enhancement in the potential release sites. In addition, the baseline assessment of the seahorse natural stocks in the potential release site was conducted in JTF5. The study aims to promote resource enhancement of seahorses by developing appropriate release and monitoring strategies, conduct biological and ecological studies for monitoring of wild and released stocks, and involve the community in the management of the natural resources by establishing a community-based seahorse hatchery.</p>
Activity 3 Technology extension and demonstration	<p>Sub-activity 3.1 Marine fish hatchery training program</p> <p>Aquaculture of high-value marine finfish species continues to develop rapidly in Southeast Asia. This training program will extend and demonstrate the breeding, hatchery seed production, nutrition and health management in grouper, seabass, snapper etc.</p> <p>Sub-activity 3.2 Rural aquaculture program</p> <p>Training focusing on promotion of community-based freshwater aquaculture for remote rural areas of Southeast Asia will be organized by SEAFDEC/AQD under this sub-activity, which will promote capacity building for establishing appropriate aquaculture system applicable in remote rural area.</p>

3.3 Activity, Sub-activity and Proposed Budget for 2014-2019

(Unit: USD)

Activity	Sub-Activity	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
Activity 1 Establishment of environment-friendly, responsible aquaculture technology	Sub-activity 1.1: Use of plant-based protein sources in tilapia feeds for improved production traits	11,000	8,800	8,800	18,800	8,800
	Sub-activity 1.2: Responsible aquaculture through aquasilviculture	11,000	8,800	8,800	8,800	8,800
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources	Sub-activity 2.1: Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	20,000	15,000	15,000	29,000	15,000
	Sub-activity 2.2: Promotion of resource enhancement of seahorses	11,000	8,800	8,800	13,880	8,800
Activity 3 Technology extension and demonstration	Sub-activity 3.1: Marine fish hatchery training program	8,000	7,500	7,500	21,000	7,500

Activity	Sub-Activity	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
	Sub-activity 3.2: Rural aquaculture program	9,000	8,500	8,500	10,500	8,500
Activity 4 Publication		0	0	0	0	0
Activity 5 Annual progress meeting and international workshop	Sub-activity 5.1: Annual progress meeting	5,000	4,000	4,000	4,000	3,140
	Sub-activity 5.2: International workshop	0	0	0	35,000	0
Activity 6 Coordination by Project Leader		4,000	4,000	4,600	4,000	4,000
	Sub-Total Budget	79,000	65,400	66,000	142,480	64,540

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Activity 1.1 Refinement of the previous tilapia feed formulation was done to include other low-cost feed ingredients (e.g. poultry by-product meal) in the formulation. Indoor feeding trials of tilapia fingerlings were conducted to test six diet formulations, containing fermented (bacteria- and *Trichoderma*-treated) and non-fermented okara meal, which were compared to a fishmeal-based (FM) diet. The three best performing diets were selected based on improved production traits of tilapia fingerlings such as weight gain and specific growth rate. The performance of these diets is currently being examined in both outdoor tank- and lake-based cages.

Activity 1.2 Compared water quality and shrimp performance of aquasilviculture ponds (separate and mixed) with non-aquasilviculture ponds.

Activity 2.1 The solar-powered hatchery is already operational but abalone spawning and natural food production needs improvement. Monitoring of abalone and sandfish stocks in the release sites continue to show increase. Replication of the CBRE in in Camarines Sur has been initiated.

Activity 2.2 Trials on nursery rearing of seahorses using natural food from the local area and train the fishermen in the community to culture seahorse.

Activity 3 Technology and information transfer on resource enhancement practice through training.

Activity 5 The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was conducted at Iloilo city, 25-27 June, 2019.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Establishment of environment-friendly, responsible aquaculture technology					
Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits	R&D				6,600 (for verification)
Sub-activity 1.2 Responsible aquaculture through aquasilviculture					
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources					
Sub-activity 2.1 Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	R&D	40 (1)	10 (1)	120 (1)	29,000
Sub-activity 2.2 Promotion of resource enhancement of seahorses	R&D		2 (1)	5 (1)	13,880
Activity 3 Technology extension and demonstration					
Sub-activity 3.1 Marine fish hatchery training program	II: Training	8 (5)			7500 as of July 2019
Sub-activity 3.2 Rural aquaculture program	II: Training to be (conducted 19 Nov.-3 Dec. 2019)	Not applicable at the moment.	Not applicable at the moment.	Not applicable at the moment.	
Activity 4 Publication					
Activity 5 Annual progress meeting and international workshop	Workshop	19 (7)	33 (14)	1 (0)	3,140

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

1: unconfirmed

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Establishment of environment-friendly, responsible aquaculture technology		
Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits	To produce tilapia with improved production traits using agricultural wastes and by-products as feed ingredients	Information on the effect of agricultural wastes and by-products (ABPs) as alternative ingredients in tilapia feeds on production parameters has been obtained based on the results of indoor tilapia feeding trials. The three best performing diets have been selected and currently being tested in tank- and lake-based cage culture conditions. Economic analysis to determine the viability of using agricultural wastes and by-products in tilapia diets shall be made.

Planned activity	Expected outcome/output	Achievements
Sub-activity 1.2 Responsible aquaculture through aquasilviculture	To compare culture water quality and shrimp performance of aquasilviculture ponds (mixed and separate) and ponds without mangroves.	Results of the first Run showed higher shrimp survival in both separate (47%) and mixed (39%) aquasilviculture ponds, compared to non-aquasilviculture pond (0%). WSSV load was higher in non-aquasilviculture pond (10^{11} copies/g) compared to aquasilviculture ponds (10^6 copies/g). Water quality was also better in aquasilviculture ponds; lower temperature, salinity and ammonia were observed.
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources		
Sub-activity 2.1 Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	Aims to increase and sustain high CPUE in release site and spill-over areas; complete and operationalize the solar-powered hatchery for abalone and sandfish; replicate project in other site; and conduct project impact assessment before end of Project.	Since 2015, after the last batch of abalone seeding, monthly monitoring showed CPUE of abalone in the release and spill-over areas continue to increase. CPUE is >150 individuals per hour dive for 3 abalone fishers. Survival, growth and density of sandfish increase, but recovery of sandfish is challenged by social problems. The hatchery structure and reinforcement was completed; hatchery and nursery operations were demonstrated hands-on to local fisherfolks. Two fisherfolks already operate the hatchery and a local electrician oversees the solar-power setup. However, not all hatching runs are successful. Site assessment and social preparations to replicate the project in Camarines Sur province already conducted. Preparation for project impact assessment in Sagay is on-going.
Sub-activity 2.2 Promotion of resource enhancement of seahorses	To determine the appropriate time of release; to determine growth and survival of the released seahorses; and to promote involvement of the community in the management of the natural resources; and to establish a community-based hatchery for seahorse.	Monthly monitoring of seahorse in the pilot site increased over the past years (2015-2019). In 2019, average number of seahorse increased at 33/sampling from 30/sampling in 2015-2018. Backyard hatchery of seahorse on a remote coastal community in Molocaboc Island was developed using solar-powered aerators and utilizing the available natural food collected from the pilot site. New-born and 3-4 months old juvenile seahorses are reared using copepods and mysid shrimps. Nursery rearing of juvenile seahorses in submerged pens until they reach 7 cm stretched height using coral rubbles as substrate for seahorses requires intensive labor in the maintenance of pens. Information education communication (IEC) activities will be continuously conducted to promote resource conservation and protection of seahorses by giving lectures to school children, giving out posters and interviews with the local community. Information education communication (IEC) activity conducted on July 17, 2019 among fisherfolk organization members
Activity 3 Technology extension and demonstration		
Sub-activity 3.1 Marine fish hatchery training program	To train participants to operate a fish hatchery by providing them	The International Training Course on Marine Fish Hatchery was conducted at Tigbauan Main Station from June 24 – July 30, 2019. There were 8 participants. Four (4) participants (1 from Viet Nam; 1 from BFAR 3, 1 from Surigao del

Planned activity	Expected outcome/output	Achievements
	with technical knowledge and skills on spawning and larval rearing of marine fishes.	<p>Sur State University, 1 from Eastern Samar State University) awarded GOJ-TF Training Fellowship Grants. The remaining 4 participants from the Philippines were business owners from the private sector. The participants reared the following species: milkfish, sea bass, tiger grouper, rabbitfish and pompano, with the following survival rates (%): Milkfish (3.75-36); sea bass (40-43.3); tiger grouper (estimated 11.67-15); rabbitfish (estimated 0.83-2); pompano (estimated 0.02-8).</p> <p>The trainees cited the following reasons for the low survival rates: clay, turbid seawater in larval rearing tanks during rainy days, insufficient supply of rotifer for feeding in the afternoon, weak flow or limited supply of seawater, presence of other fish in larval rearing tanks and contamination of natural food. As solutions to the above problems, the trainees made the following recommendations: improve water filtration system, increase number of tanks for natural food culture, provide separate seawater reservoir for larval rearing tanks, provide partition between phytoplankton and zooplankton culture tanks</p>
Sub-activity 3.2 Rural aquaculture program	Enhance participants' knowledge and skills on freshwater aquaculture technologies from broodstock development to seed production, nursery and grow-out phase.	Preparations (<i>e.g.</i> sending out of invitation letters to SEAFDEC Member Countries, review of training course curriculum and details of schedule, etc.) are in progress. This year's International Training Course on Community-Based Freshwater Aquaculture for Remote Rural Areas in Southeast Asia will be held from November 19 to December 3, 2019 at AQD's Freshwater Station in Binangonan, Rizal.
Activity 4: Publication	To print proceedings for workshop	The proceedings of International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)" to be printed in first quarter of 2020.
Activity 5: Annual progress meeting and international workshop	To hold international workshop	The International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)" was conducted at Iloilo city from 25-27 June, 2019. There were fifty-three participants. Nineteen participants from Member Countries, one participant from other country and thirty-three participants from SEAFDEC were attended.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
1. Frolan A. Aya, John Carlo L. Unida, Mary Jane P. Sayco, Maria Rowena Romana-Eguia, Nerissa D. Salayo (2019) Converting Agricultural Wastes and By-Products into Valuable Feed Ingredients for Tilapia Culture. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.	Book of Abstract	
2. Eleonor A. Tendencia (2019) Responsible Aquaculture through Aquasilviculture. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.	Book of Abstract	
3. Nerissa D. Salayo, Jon P. Altamirano, Margarita T. Arnaiz, QS Montinola, RT Barrido, RJG Castel, N Pacardo, RN Baylon (2019) Community-based Integrated Production of Abalone, <i>Haliotis asinina</i> , and Sandfish, <i>Holothuria scabra</i> , through Culture, Sea Ranching, and Stock Enhancement. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.	Book of Abstract	
4. Shelah Mae B. Ursua (2019) Promotion of Resource Enhancement of Seahorses. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.	Book of Abstract	
5. Rosenio R. Pagador (2019) Marine Fish Hatchery Training Course. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.	Book of Abstract	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1 Establishment of environment-friendly, responsible aquaculture technology	
Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits	Positive comments from the evaluators during the annual review of GOJ-funded projects. Preliminary results of the study have been disseminated to local and international participants during the training courses organized by AQD.
Sub-activity 1.2 Responsible aquaculture through aquasilviculture	Not applicable
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources	
Sub-activity 2.1 Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	<p>During field trips, participants in AQD training courses on hatchery and grow-out of abalone and sandfish evaluated this CBRE project in Sagay as successful. Some AQD trainees participate in monthly monitoring to assess performance of stock enhancement of abalone and sandfish. This activity consistently obtained high rating (8-10/10) during GOJ Annual Project Review and Evaluation.</p> <p>The fisherfolks in Sagay learned from demonstration and participation in monitoring released stocks. Fisherfolks</p>

Planned activity	Evaluation/ Views from Participants
	capacitated in managing released abalone and sandfish stocks; and obtained economic benefit from regulated harvests (>6cm abalone shell length, >320g sandfish live weight) inside and outside the release sites.
Sub-activity 2.2 Promotion of resource enhancement of seahorses	Progress report presented during SARSEA meeting on June 25-27, 2019. Low-cost seahorse hatchery in a remote community established in Molocaboc Island visited by local communities, BFAR personnel and trainees/students.
Activity 3 Technology extension and demonstration	
Sub-activity 3.1 Marine fish hatchery training program	Participants evaluated the conduct of the training course and gave an overall rating of very good, covering the period 2015- 2019, based on the following criteria: relevance of topics, technical knowledge learned by the participants, their confidence to do duties upon return, and overall coordination of training activities
Sub-activity 3.2 Rural aquaculture program	Not applicable at the moment. Training course on rural aquaculture will be conducted from November 19 to December 3, 2019.
Activity 4: Publication	Not applicable
Activity 5: Annual progress meeting and international workshop	The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was highly evaluate from Participants (average mark was 4.6 out of 5).

6. Major Impacts/Issues

Activity 1.1 Project reached 95% completion; sub-activities on nutritional quality, protein enrichment of ABPs, pesticide residue levels and anti-nutritional factors (ANFs) analyzed to assess suitability of ABPs as alternative feed ingredients for tilapia. Enrichment studies have been conducted to improve the nutritional value as well as possible reduce the ANFs in ABPs. Laboratory trials have been conducted to examine the performance of mixed-sex tilapia fingerlings fed on diets with non-fermented and fermented ABPs. On-farm trials are needed to verify the results of the laboratory trials using sex-reversed tilapia fingerlings. While some equipment has been fabricated to process huge amount of ABPs (*e.g.* okara meal), plans to develop, in collaboration with government agency or academe, a low-cost equipment such as fermentor to process and treat ABPs into utilizable feed ingredients.

Activity 2.1 The major impact of the CBRE project is the rebuilding of overfished fisheries through releases of hatchery-reared juveniles and the community-based and tri-party collaboration to implement and manage the CBRE. The completed abalone and sandfish hatchery and nursery provided assurance of sustainable CBRE because juveniles for release can be produced locally on small-scale. Fisherfolks have been capacitated in aquaculture operations that will supply seeds for stock enhancement, and also improved their understanding of fish biological processes that enabled them as better stewards of the fisheries and environment. The regulated harvest of abalone (>6cm shell length) and sandfish (320g live weight) from the CBRE site continue to contribute to the income of fishing households and provide funds for their fisherfolks organization. The CBRE can be promoted and replicated in other appropriate sites.

Activity 5 The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was highly evaluate from Participants (average mark was 4.6 out of 5). The participants could be updated on the issues related to sustainable aquaculture, aquatic animal health and resource enhancement, and could put forward recommendations to address the issues.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

Activity 1.1 A survey of the major crop industries revealed that high amount of wastes was generated after processing. Analysis of the pesticide residue levels, anti-nutritional factors, and the proximate composition of agricultural wastes and by-products (ABPs) were done to assess the suitability of ABPs as alternative ingredients in tilapia diets. Among the ABPs examined, mango and citrus peels had pesticide residue levels exceeding the limit of quantification of 0.01 mg/kg measured by the Department of Agriculture - Bureau of Plant Industry National Pesticide Analytical Laboratory. Although, these levels were still lower than the maximum residue limits (MRLs) set by the FAO Codex Alimentarius. The limitations to use ABPs in aquaculture feeds were mostly associated with high levels of lignin, saponins, phenols and low to moderate levels of tannins. Proximate composition of selected ABPs had shown their potential as either protein or energy sources in fish feeds. Enrichment studies using ensiling and solid state fermentation of ABPs with *Trichoderma*, *Bacillus subtilis* and yeast were conducted as well to improve the nutritional value of selected ABPs. Information on the effect of mango peel silage (MPS) supplementation on reproductive performance of Nile tilapia broodstock in tanks and lake-based cage conditions was known, with higher fry production noted for groups supplemented with MPS at 50%. The optimal inclusion levels of soybean curd residues (or okara meal (OM)) and citrus by-products (*e.g.* citrus peel and citrus pulp) in diets for tilapia fingerlings were determined at 30% and 1%, respectively. The performance of tilapia diets with non-fermented and fermented soybean curd residues examined previously in indoor feeding trials is currently being tested in outdoor tank and lake-based cage conditions. Preliminary study information has been disseminated to participants in training courses organized by AQD, which included BFAR staff.

Activity 1.2 A previous study reported that the presence of mangroves in the receiving environment enhances shrimp survival via an improved incoming water quality. The present study determines the time required for a mangrove habitat to remove nutrients from shrimp farm effluents. Results showed that ammonia, phosphate, chlorophyll *a* and total suspended solids were fluctuating but statistically lower in water drained into mangrove habitat (MPR=2:1 and MPR=4:1) compared to area without mangrove. At MPR=4:1, ammonia is removed from the water after 3 days; TSS after 2 days; phosphate and chlorophyll after 7 days. At MPR=2:1, only ammonia can be efficiently removed and after 3 days. Nutrient removal from the water can be attributed to the nutrient uptake by the mangrove as manifested in the greater increase in growth in terms of stem length of saplings and trees in area receiving shrimp farm effluents compared to those not receiving. Water quality and shrimp performance in aquasilviculture (separate and mixed) and non-aquasilviculture ponds were compared. Results showed higher shrimp survival in both separate (47%) and mixed (39%) aquasilviculture ponds, compared to non-aquasilviculture pond (0%). WSSV load was higher in non-aquasilviculture pond (10^{11} copies/g) compared to aquasilviculture ponds (10^6 copies/g). Water quality was also better in aquasilviculture ponds; lower temperature, salinity and ammonia were observed.

Activity 2.1 The CBRE project has successfully demonstrated that hatchery-reared abalone and sandfish juveniles can rebuild overfished fisheries. The community-based and tri-party collaborative approach between fishers, local government, and research and donor institutions enabled better governance of enhanced fisheries and can provide economic benefits to marginalized fishing communities. Hands-on training in the on-site hatchery capacitated fisherfolks to enable production of seeds for sustaining enhancement activities.

Activity 2.2 To promote resource enhancement of seahorses this study aims to develop appropriate release and monitoring strategies of seahorses with the involvement of community in the management of the natural resources. Transport trials on juvenile seahorses (5-7 cm stretched height) showed optimum stocking density of 3 ind/L for up to 12 h duration. Monthly monitoring of wild seahorses on a patch reef in Molocaboc Island, showed stretch height of seahorses (12-13 cm) and body weight (5.7-8.5 g) were not significantly different from 2015 to 2019. Higher percentage of juveniles was sampled in 2018 and 2019 (5.3%) than in 2015, 2016 and 2017 (1.6, 1.4 and 0.5%, respectively). Gonad development stage showed reproductively mature male and female seahorses were present all year round. Average number of animals (30-34 ind/sampling) in 2016 to 2019 were higher than in 2015 (23 ind/sampling) and 2013 (5 ind/sampling).

A low-cost seahorse hatchery facility and fixed-bottom nursery pens are being developed to train the local community on the technique of seahorse seed production using the available natural food in the coral reef areas. Annual information, education and communication (IEC) campaign to the local community includes lectures on seahorse biology and resource management.

Activity 3.1) The main objective of the marine fish hatchery training program is to provide participants

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1 Establishment of environment-friendly, responsible aquaculture technology	
Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits	<ol style="list-style-type: none"> 1) Review of secondary data of major crop production; conduct interview/ survey of major crop producers and processing plants 2) Analyze chemical composition/ or presence of anti-nutritional factors (ANFs) and pesticide residue levels in agricultural wastes and by-product (ABPs) 3) Testing of processing techniques to improve nutritional value of selected ABPs 4) Conduct of laboratory and outdoor feeding trials to assess the effects of ABPs on performance of tilapia broodstock and fingerlings
Sub-activity 1.2 Responsible aquaculture through aquasilviculture	<ol style="list-style-type: none"> 1) Duration for a mangrove habitat to remove nutrients from shrimp pond including factors affecting mangrove efficiency in nutrient removal of shrimp pond effluents were investigated. 2) The appropriate mangrove to pond area ratio that efficiently remove nutrients from shrimp pond effluents were determined. Culture water quality and shrimp performance of aquasilviculture ponds (mixed and separate) and ponds without mangroves were compared.
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources	
Sub-activity 2.1 Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	<ol style="list-style-type: none"> 1) Release abalone and sandfish and abalone juveniles; and monthly monitoring of growth, survival and increase in CPUE, including indications of spill-overs to sustain stocks. 2) Construction and operationalization of the solar-powered hatchery; and training of fisherfolks on hatchery operations 3) Site assessment and social preparations to replicate the project in Camarines Sur province already conducted. 4) Preparation for project impact assessment.
Sub-activity 2.2 Promotion of resource enhancement of seahorses	To promote resource enhancement of seahorses by developing appropriate release and monitoring strategies, conduct biological and ecological studies for monitoring of wild and released stocks, involve the community in the management of the natural resources and establish a community-based seahorse hatchery and nursery pens.
Activity 3 Technology extension and demonstration	
Sub-activity 3.1 Marine fish hatchery training program	<ol style="list-style-type: none"> 1) Conduct of the marine fish hatchery training program for SEAFDEC Member Countries, a 37 days training program consisting of lectures and hands-on activities on fish broodstock management, natural food culture, fish health management, fish nutrition, feeds and feeding management, larval rearing of milkfish, sea bass, rabbitfish, groupers, mangrove red snapper and pompano. 2) The course curriculum also includes visits to AQD stations in Dumangas and Guimaras, as well as private farms and hatcheries.

List of Activities	Description of Implemented Activities
Sub-activity 3.2 Rural aquaculture program	<ol style="list-style-type: none"> 1) Conduct of preparatory activities such as sending out of acceptance letters, revision of training prospectus and details of training activities 2) Coordination of training activities such as lectures, practical sessions, farm visits and field trips to various research institutions 3) Preparation of training report
Activity 4 Publication	The proceedings of International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” to be printed in first quarter of 2020.
Activity 5 Annual progress meeting and international workshop	Annual and semi-annual progress meeting were conducted every year. The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was conducted at Iloilo city from 25-27 June, 2019.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1 Establishment of environment-friendly, responsible aquaculture technology	
Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits	<ol style="list-style-type: none"> 1) Survey of major crop industries revealed high amount of agricultural wastes and by-products (ABPs) generated after processing. No use in aquaculture was reported as well as treatments done prior to disposal of these ABPs. 2) Among the ABPs examined, mango and citrus peels had pesticide residue levels exceeding the limit of quantification of 0.01 mg/kg measured by the Department of Agriculture - Bureau of Plant Industry National Pesticide Analytical Laboratory. However, these levels were still lower than the maximum residue limits (MRLs) set by the FAO Codex Alimentarius. ABPs contained high levels of lignin, saponins, phenols and low to moderate levels of tannins. Based on the proximate composition, ABPs can either be a protein or energy source in fish feeds. 3) Enrichment studies of ABPs by ensiling or with <i>Trichoderma harzianum</i> Rifai by solid state fermentation have been shown to improve their protein contents with nutrient supplementation. Fermentation of ABPs particularly soybean curd residues with <i>Bacillus subtilis</i> and yeast was also done in the laboratory. 4) Feeding trials showed that dietary substitution of fishmeal with mango peel silage did not show any adverse effects on fry production of Nile tilapia broodstock. Tilapia fingerlings grew well in diets with 30% soybean cured residues as well as when fed diets supplemented with 1% each of citrus pulp and citrus peel.
Sub-activity 1.2 Responsible aquaculture through aquasilviculture	<ol style="list-style-type: none"> 1) Results showed that ammonia, phosphate, chlorophyll a and total suspended solids were fluctuating but statistically lower in water drained into mangrove habitat (MPR=2:1 and MPR=4:1) compared to area without mangrove. At MPR=4:1, ammonia is removed from the water after 3 days; TSS after 2 days; phosphate and chlorophyll after 7 days. At MPR=2:1, only ammonia can be efficiently removed and after 3 days. 2) The growth of plants in areas receiving and not receiving shrimp farm effluents were compared by measuring the monthly increase in height of the seedlings and the increase in length in the stem between two nodes in saplings and trees. After 3 months, increase in growth was greater in plants in area receiving shrimp farm effluents compared to those not receiving, except for the seedlings. This indicate that mangroves purify the water by nutrient uptake as supported by the data showing greater

List of Activities	Achievements and Outcomes/Outputs of Activities
	<p>increase in stem length in saplings and trees.</p> <p>3) Results of the first run showed higher shrimp survival in both separate (47%) and mixed (39%) aquasilviculture ponds, compared to non-aquasilviculture pond (0%). WSSV load was higher in non-aquasilviculture pond (1011 copies/g) compared to aquasilviculture ponds (106 copies/g). Water quality was also better in aquasilviculture ponds; lower temperature, salinity and ammonia were observed.</p>
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources	
Sub-activity 2.1 Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	<p>1) The solar-powered hatchery structure was completed; hatchery and nursery operations were demonstrated hands-on to local fisherfolks. Two fisherfolks already operate the hatchery and a local electrician oversees the solar-power setup.</p> <p>2) Monthly monitoring showed CPUE of abalone and sandfish in the release and spill-over areas continue to increase. The corals where abalone lives grew due to protection by local fisherfolks.</p> <p>3) Site assessment and social preparations to replicate the project in Camarines Sur province already conducted. Preparation for project impact assessment in is on-going.</p>
Sub-activity 2.2 Promotion of resource enhancement of seahorses	<p>1) Transport trials on three size groups of juvenile seahorses (5, 6, and 7 cm stretched height) showed optimum stocking density of 3 ind/L for all size groups up to 12 h transport duration.</p> <p>2) Monthly monitoring of seahorses on a patch reef in Molocaboc Island, showed average stretch height of seahorses (11.9 - 12.7 cm) and body weight (5.74-8.5 g) was not significantly different from 2015 to 2019.</p> <p>3) Higher percentage of juveniles were sampled in 2018 and 2019 (5.3%) than in 2015, 2016 and 2017 (1.6, 1.4 and 0.5%, respectively), which accounted for the decrease of the average body weight.</p> <p>4) Gonad development stage showed reproductively mature male and female seahorses were present all year round.</p> <p>5) Average number of animals (30-34 ind/sampling) in 2016 to 2019 was higher than in 2015 (23 ± 4 ind/sampling).</p> <p>6) A low-cost seahorse hatchery facility and fixed-bottom nursery pens are being developed to train the local community on the technique of seahorse seed production using the available natural food in the coral reef areas.</p> <p>7) Annual information, education and communication (IEC) campaign to the local community includes lectures on seahorse biology and resource management.</p>
Activity 3 Technology extension and demonstration	
Sub-activity 3.1 Marine fish hatchery training program	<p>1) Implemented the Marine fish hatchery training course as scheduled; participants from Member Countries successfully cultured phytoplankton (green algae) and zooplankton (rotifer); successfully reared marine fishes (milkfish, groupers, sea bass, mangrove red snappers, rabbitfish and pompano) from day 0 until termination of larval rearing runs or the duration of the training course; and lastly, GOJ-funded participants submitted narrative reports.</p>
Sub-activity 3.2 Rural aquaculture program	<p>1) Preparatory activities were successfully done for the yearly conduct of the rural aquaculture training program</p> <p>2) Training activities were done as scheduled, with the conduct of rapid rural appraisal activities in small-scale fish farming communities closely coordinated with the Municipal Agricultural Offices; a total of 25 participants completed the rural aquaculture program from 2015-2018</p>

List of Activities	Achievements and Outcomes/Outputs of Activities
	3) Training report submitted summarizing the activities conducted, recommendations, project proposals, and assessment on the overall conduct of the training program
Activity 4 Publication	
Activity 5 Annual progress meeting and international workshop	Annual and semi-annual progress meeting were conducted every year, it contributed for proper practice of the project. The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was conducted at Iloilo city from 25-27 June, 2019. There were fifty-three participants. Nineteen participants from Member Countries, one participant from other country and thirty-three participants from SEAFDEC were attended. The participants also reported on the status of sustainable aquaculture, resource enhancement and aquatic animal health of their respective countries. The participants could be updated on the issues related to sustainable aquaculture, aquatic animal health and resource enhancement, and could put forward recommendations to address the issues.

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Activity 1.1 Project reached 95% completion; sub-activities on nutritional quality, protein enrichment of ABPs, pesticide residue levels and anti-nutritional factors (ANFs) analyzed to assess suitability of ABPs as alternative feed ingredients for tilapia. Enrichment studies have been conducted to improve the nutritional value as well as possible reduce the ANFs in ABPs. Laboratory trials have been conducted to examine the performance of mixed-sex tilapia fingerlings fed on diets with non-fermented and fermented ABPs. On-farm trials are needed to verify the results of the laboratory trials using sex-reversed tilapia fingerlings. While some equipment has been fabricated to process huge amount of ABPs (*e.g.* okara meal), plans to develop, in collaboration with government agency or academe, a low-cost equipment such as fermentor to process and treat ABPs into utilizable feed ingredients.

Activity 2.1 The major impact of the CBRE project is the rebuilding of overfished fisheries through releases of hatchery-reared juveniles and the community-based and tri-party collaboration to implement and manage the CBRE. The completed abalone and sandfish hatchery and nursery provided assurance of sustainable CBRE because juveniles for release can be produced locally on small-scale. Fisherfolks have been capacitated in aquaculture operations that will supply seeds for stock enhancement, and also improved their understanding of fish biological processes that enabled them as better stewards of the fisheries and environment. The regulated harvest of abalone (>6cm shell length) and sandfish (320g live weight) from the CBRE site continue to contribute to the income of fishing households and provide funds for their fisherfolks organization. The CBRE can be promoted and replicated in other appropriate sites.

Activity 3.2 The rural aquaculture training program was successful in view of the recommendations from the participants to further continue the conduct of this training program. The Rapid Rural Activities (RRA) provided the participants with a learning opportunity to interact with various stakeholders in a community. Engaging the community will definitely enhance their social role as extension workers in disseminating the aquaculture technologies as well as educating the stakeholders on good aquaculture practices. Participants were pleased with the overall coordination and quality of the training.

Activity 5 The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was highly evaluate from Participants (average mark was 4.6 out of 5). The participants could be updated on the issues related to sustainable aquaculture, aquatic animal health and resource enhancement, and could put forward recommendations to address the issues.

Publications and Others

- Maria Rowena R. Romana-Eguia, Fe D. Parado-Estepa, Nerissa D. Salayo and Ma, Junemie Hazel Lebata-Ramos edit. (2015) Resource Enhancement and Sustainable Aquaculture Practices in Southeast Asia (RESA2014). Proceedings of the international Workshop, ISBN: 978-971-9931-04-1, SEAFDEC AQD
- Salayo ND, Castel RJG, Barrido RT, Tormon DHM, Azuma T. (2016) Community-based stock enhancement of abalone, *Haliotis asinina* in Sagay marine reserve: Achievements, limitations and directions. In: Hajime K, Iwata T, Theparoonrat Y, Manajit N, Sulit VT (eds.). Consolidating the Strategies for Fishery Resources Enhancement in Southeast Asia. Proceedings of the Symposium on Strategy for Fisheries Resources Enhancement in the Southeast Asian Region, Pattaya, Thailand; 27-30 July 2015; Samutprakan, Thailand: Training Department, Southeast Asian Fisheries Development Center; pp. 131-135.
- SEAFDEC AQD (2017) "AQUACULTURE: KEY TO REBUILDING COASTAL RESOURCES AND LIVELIHOOD THROUGH" Community-Based Resource Enhancement (CBRE) in Sagay Marine Reserve, Sagay City, Philippine (Flyers/Brochures), SEAFDEC AQD.
- SEAFDEC AQD (2017) "ABALONE Culture" (Flyers/Brochures), SEAFDEC AQD.
- S.M.B. Ursua (2017). Initiating resource enhancement of seahorses: a case study of Sagay Marine reserve in Central Philippines. Fish for the People, Vol. 15 Number 3, pages 56-59.
- Aya FA (2017) Utilizing alternative ingredients in aquafeeds for sustainable aquaculture. Fish for the People Vol. 15 No. 3, 37-44 (some of project activities were discussed in this paper)
- Tendencia EA, VJ Estilo (2018) Ecological Approaches Toward Sustainable Aquaculture. Presented at the 4th International Conference on Tropical and Coastal Ecosystem and Development (4th ICTCRED), 30-31 Oct 2018, Semarang Indonesia
- Nerissa D. Salayo(2018) Updates on SEAFDEC/AQD Resource Enhancement Activities, Regional Technical Meeting on Resource Enhancement in SEA, Bangkok Thailand, 24-26 April 2018.
- Frolan A. Aya, John Carlo L. Unida, Mary Jane P. Sayco, Maria Rowena Romana-Eguia, Nerissa D. Salayo (2019) Converting Agricultural Wastes and By-Products into Valuable Feed Ingredients for Tilapia Culture. Presented at the International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)", 25-27 Jun 2019, Iloilo Philippines.
- Eleonor A. Tendencia (2019) Responsible Aquaculture through Aquasilviculture. Presented at the International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)", 25-27 Jun 2019, Iloilo Philippines.
- Nerissa D. Salayo, Jon P. Altamirano, Margarita T. Arnaiz, QS Montinola, RT Barrido, RJG Castel, N Pacardo, RN Baylon (2019) Community-based Integrated Production of Abalone, *Haliotis asinina*, and Sandfish, *Holothuria scabra*, through Culture, Sea Ranching, and Stock Enhancement. Presented at the International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)", 25-27 Jun 2019, Iloilo Philippines.
- Shelah Mae B. Ursua (2019) Promotion of Resource Enhancement of Seahorses. Presented at the International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)", 25-27 Jun 2019, Iloilo Philippines.
- Rosenio R. Pagador (2019) Marine Fish Hatchery Training Course. Presented at the International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)", 25-27 Jun 2019, Iloilo Philippines.

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

			Project ID: 201503001
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region		
Program Strategy No. :	II	Total Duration:	2015-2019
Lead Department:	Aquaculture Department (AQD)	Lead Country:	Philippines
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 383,107
Project Partner:	None	Budget for 2019:	USD 65,510
Project Leader:	Koh-ichiro Mori / AQD	Project Participating Country(ies):	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

This Project titled “Reinforcement and optimization of fish health management and the effective dissemination” was proposed to:

1) Develop and accelerate rapid and effective fish and shrimp health management

Preventive management strategies should be established to maintain the disease-free status for cultured stocks. Technology for early detection of these devastating viruses should be developed using optimized practical molecular diagnostic tools.

2) Enhance efficacy of vaccine treatment in tropical cultured species

Vaccines for NNV and WSSV have been developed. However, the efficacies of these treatments need further improvement. Technology of oral delivery of vaccine will be developed for the practical use in aquafarmers using carriers possessing immunomodulatory to enhance the overall immunogenicity of the vaccine.

3) Establish protective measures against persistent and emerging parasitic diseases of tropical fish

Avoidance of persistent and emerging parasitic diseases is of prime importance to secure sustainable production of food fish in the Southeast Asian Region. To avoid economic losses due to pressing problems attributed to parasitic infections in cultured fish, novel and practical prevention and control strategies should be established. Additionally, the species diversity of emerging parasites including their morphological characteristics and life cycle should be thoroughly investigated.

4) Identify risk factors and develop protective measures against Early Mortality Syndrome (EMS)

Based on the etiological agents together with identification of risk and protective factors, the protective measures will be developed against EMS. Guidelines to protect shrimp from EMS will be established.

5) Extend & demonstrate technology to practitioners, officers, etc. of Member Countries

Training programs will be implemented on specific topics based on the request from Member Countries, which necessitate the information dissemination on fish health management. In the first year, 2015, the 2-3 days course about EMS will be commenced in Myanmar.

2. Background and Justification

The Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC/AQD) initiated the Fish Disease Projects funded by the Government of Japan in response to numerous requests from various sectors for intensified research on fish health-related problems arising in the Southeast Asian region. Phase I (2000-2004) of the said projects focused on technologies to control diseases through timely

and accurate recognition, sound diagnostic capabilities, and control measures for various diseases. Phase II (2005-2009) focused on disease surveillance activities based on the results of the earlier program. Thereafter, the importance of accelerating the delivery of information awareness among aquafarmers and the establishment of disease prevention methods emerged after reviewing the outcomes of the previous two project phases. To attain the above targets, Phase III (2010-2014) with the main topic “Accelerating awareness and capacity building in Southeast Asia” has been focusing on the greater dissemination of knowledge relevant to fish health management, especially to the SEAFDEC Member Countries (MCs) whose capacities still need to be developed and improved. At the same time, innovative researches and technology development have been also implemented.

An integrated fish-health-care system expected to be established through the Phase III project aimed to ensure a holistic approach toward “healthy and wholesome” aquaculture practices enabling a stable supply of safe aquaculture products. The concept of the holistic approach was one of the six themes under Sustainable Aquaculture during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People” that was held in Bangkok in November 2001, and later in June 2011.

In practice, irrespective of the correct direction of the approach, however, there are still high needs for information dissemination and technology transfer in MCs, especially in lesser developing countries in terms of fish health management. In addition, serious issues relevant to the fish health management to be overcome have been often emerging, battering and disconcerting aqua farmers as shown in emerging diseases like Early Mortality Syndrome (EMS) hindering the wholesome development of aquaculture in our region. Realizing that the global market has become more stringent for exporting countries like the Southeast Asian countries, it is highly recommended to effectively disseminate the useful information such as precaution of potential diseases outbreak and recommendation of appropriate fish health management to local government unit officers, aquafarmers, traders, etc. promptly and appropriately. Urging better understanding on the risks, impacts and management problems related to diseases is very important because health management practices significantly affect product quality as well as quantity, and thus link with the economic stability for aquafarmers and fisheries community development.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
	Outcome 1: Development and acceleration of rapid and effective fish and shrimp health management.	Output 1: Establishment of the early and effective intervention strategies through strict monitoring of the health status on cultured shrimp and fish by the farmers.	Activity 1: Development and acceleration of rapid and effective fish and shrimp health management <ul style="list-style-type: none"> ➤ Determination of threshold infection levels for WSSV and other pathogen such as VP_{AHPND} ➤ Development of optimized q-PCR protocols for the detection of WSSV and VP_{AHPND}
Objective 2: To enhance efficacy of vaccine treatment in tropical cultured species	Outcome 2: Enhancement of efficacy of vaccine treatment in tropical cultured species.	Output 2: Development of the practical method of delivering vaccine to fish with increased efficacy thereby preventing unwarranted outbreaks of VNN in hatcheries and grow-out culture systems.	Activity 2: Enhancement of efficacy of vaccine treatment in tropical cultured species <ul style="list-style-type: none"> ➤ Evaluation of the field efficacy of the inactivated NNV vaccine against natural or experimental NNV infection in pompano (net cage, open sea) and grouper (earthen pond) ➤ Elucidation of the effect of primary sublethal NNV injection followed by lethal NNV injection in pompano in conjunction with the antibody production and conferment of protection (RPS)

Objective	Outcomes	Outputs	Activities
		Development of the method of delivering vaccine to shrimp with increased efficacy and prevention of white spot disease by interfering with its replication in the host.	<ul style="list-style-type: none"> ➤ Evaluation of the efficacy of RNAi in protecting shrimp against WSSV infection ➤ Development of delivery scheme using a combination of the antiviral treatments ➤ Development of low-cost delivery method for the antiviral treatments: tank studies ➤ Field Efficacy Evaluation of the combined antiviral treatment
Objective 3: To establish protective measures against persistent and emerging parasitic diseases of tropical fish	Outcome 3: Establishment of protective measures against zoonotic diseases of fish.	Output 3: Establishment of practical and efficient protocol for the prevention and control of persistent and emerging fish parasites	Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish <ul style="list-style-type: none"> ➤ Development of practical strategies that could be adopted by farmers to address the pressing problem on mass mortalities of net-caged and pond reared fishes attributed to persistent and emerging fish parasites
Objective 4: To identify risk factors and develop protective measures against Early Mortality Syndrome (EMS) /Acute Hepatopancreatic Necrotic Disease (AHPND)	Outcome 4: Development of protective measures against emerging diseases.	Output 4: Establishment of practical and effective methods for the prevention and control of EMS	Activity 4: Epidemiology of the Early Mortality Syndrome (EMS) <ul style="list-style-type: none"> ➤ Development of the protective measures against EMS, based on the etiological agents together with identification of risk and protective factors. ➤ Establishment of guidelines to protect shrimp from EMS.
Objective 5: To extend & demonstrate technology to practitioners, officers, etc. of Member Countries	Outcome5: Technology extension and demonstration to practitioners, officers, etc. of Member Countries through training courses.	Output5: Effective and functional development of fish health management and guarantee for the sustainable development of aquafood production together with the poverty alleviation in Southeast Asian countries.	Activity 5: Technology extension and demonstration <ul style="list-style-type: none"> ➤ Implementation of training programs on specific topics based on the request from Member Countries, which necessitate the information dissemination on fish health management.

3.2 Overall Scope/Description of Project

Activity	Description
<p>Activity 1: Development and acceleration of rapid and effective fish and shrimp health management</p>	<p>Viral and bacterial diseases have caused major constraints in shrimp farming in most Asian countries and in the world. The continued occurrence of the most devastating viral disease, the white spot syndrome virus (WSSV), and other pathogens such as VP_{AHPND} that cause acute hepatopancreatic necrosis disease (AHPND) necessitate the establishment of domesticated shrimp stocks that are free of these pathogens. Early detection of these devastating pathogens is the most efficient response to be able to implement immediate and appropriate interventions for the control of the spread of infection. Early detection of these devastating pathogens is the most efficient response to be able to implement immediate and appropriate interventions for the control of the spread of infection. Prompt diagnosis will give fish and shrimp farmers better health management of their stocks which will in turn minimize the losses due to diseases. Molecular-based techniques such as the use of polymerase chain reaction (PCR), quantitative polymerase chain reaction (q-PCR) and loop mediated isothermal amplification (LAMP)-based detection methods will be considered. Development and optimization of conventional and quantitative polymerase chain reaction-based detection methods will enable farmers to strictly monitor health status so that early and effective intervention strategies can be implemented. Adoption and development of LAMP offers a cheaper, more rapid and convenient detection method for existing and emerging shrimp and fish pathogens. These developed and optimized practical molecular diagnostic tools will be primarily adopted in Fish Health Diagnostic Laboratories. (Locations: Philippines and other Member Countries concerned)</p>
<p>Activity 2: Enhancement of efficacy of vaccine treatment in tropical cultured species</p>	<p>Sub-activity 2.1 Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish. This study will pilot test the field efficacy of the previously developed inactivated NNV vaccine in pompano and groupers reared in floating net cages and earthen pond, respectively. Moreover, the feasibility of using a sublethal dose of NNV followed by subsequent exposure of these fish to a higher inoculum dose of the homologous NNV as a practical strategy to induce potent production of NNV-neutralizing antibodies and concomitant protection against experimental NNV challenge will be elucidated. Outputs of this study are expected to be used as practical strategies to combat unwarranted outbreaks of VNN in pompano, groupers, and other susceptible marine fish species particularly during the nursery or early phase of culture when these fish species are highly susceptible to the disease.</p> <p>Sub-activity 2.2 Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV The objective of the study is to develop and adopt methods to enhance the efficacy of present vaccines for shrimp and other antiviral approaches such as RNAi. Similar to above, methods for vaccine production for WSSV will be adopted from JTF5 studies. The delivery vehicle will be based on the results of the previous vaccination study in shrimp. In addition, recent trends utilizing RNAi as an antiviral strategy in shrimp culture will be adopted. After the shrimp have been subjected to these antiviral treatments, the shrimp will be experimentally challenged based on established procedures.</p>

Activity	Description
	Efficacy of the vaccines/RNAi treatment will be evaluated based on RPS. The expected output from the study is a method of delivering vaccine to shrimp with increased efficacy and prevention of white spot disease by interfering with its replication in the host. (Location: Philippines and other Member Countries concerned)
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	The primary goal of this study is to develop practical strategies that could be adopted by farmers to address the pressing problem on mass mortalities of net-caged and pond reared fishes attributed to persistent and emerging fish parasites. The efficacy of new anti-parasitic agents in consonance with good aquaculture practices will be examined. In addition, the species diversity, morphology and life cycle, and epidemiology of emerging parasites in both marine and freshwater fishes will be investigated. Once pertinent data are generated, prevention and control measures against these parasites could be instituted.
Activity 4: Epidemiology of the Early Mortality Syndrome (EMS)/Acute Hepatopancreatic Necrotic Disease (AHPND)	Early Mortality Syndrome (EMS) otherwise known as Acute Hepatopancreatic Necrosis Syndrome (AHPNS) is an emerging disease affecting most Southeast Asian Countries whose putative disease-causing agent has been confirmed recently to be <i>Vibrio parahaemolyticus</i> . This study will try to develop protective measures based on the etiological agents together with identification of risk factors and protective factors. Visit to farms with (EMS/AHPNS) outbreaks (Thailand, Viet Nam, and Indonesia) will be undertaken to collect samples and other farm data. Samples of EMS/AHPNS – “infected” shrimp will be analyzed using histopathological techniques. Measures to exclude the pathogen from the farm, good management practices, good nutrition, and proper handling of the fish to prevent unnecessary stress to the animals will be formulated. From these broad measures, specific protocols to prevent the outbreak of this disease will be developed in cooperation with farmers and hatchery operators. Expected output of the study will be specific recommendations and guidelines to protect shrimp from EMS/AHPNS. (Location: Member Countries concerned)
Activity 5: Technology extension and demonstration	An important component of an effective aquatic health management system requires trained government and private industry personnel for roles in disease diagnostics, epidemiology, biosecurity, disease emergency management, and scientific research. The availability of trained personnel designated to fill these roles directly impacts the strength of the aquatic animal health management system of a certain country in the region. On-site training/ hands on activities and guided research designed for fish health personnel to keep abreast with diseases confronting important aquatic species in the region is a pragmatic strategy aimed at generating a pool of information essential for the formulation of practical disease prevention and control strategies and enhancement of fish health workers’ capacity to plan and execute appropriate and timely scientific research. (Location: Member Countries concerned)
Activity 6: Publication	Manuals, posters, pamphlets and flyers describing disease prevention methods will be published and distributed.
Activity 7: Annual progress meeting and international workshop	<p>Sub-activity 7.1 Annual progress meeting Annual meeting organized by SEAFDEC/AQD is held to review the project achievement. Evaluators will be invited to join the meeting to review/evaluate the project achievements.</p> <p>Sub-activity 7.2 International workshop The workshop, not only receive participants from Member Countries, but also invite expert scientists as key note speakers to facilitate to spread and exchange brand-new information on fish health management between SEAFDEC and various institutions.</p>

Activity	Description
Activity 8: Coordination by the project leader	The project leader coordinates and encourages the research, training and dissemination, and also facilitates information exchange not only between activities but also among Member Countries.

3.3 Activity, Sub-activity and Proposed Budget for 2014-2019

(Unit: USD)

Activity	Sub-Activity	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
Activity 1: Development and acceleration of rapid and effective fish and shrimp health management		11,000	8,800	8,800	18,800	8,800
Activity 2: Enhancement of efficacy of vaccine treatment in tropical cultured species	Sub-activity 2.1: Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	11,000	8,800	8,800	15,800	8,800
	Sub-activity 2.2: Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	11,000	8,800	8,800	10,800	10,800
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish		11,000	8,800	8,800	15,800	8,800
Activity 4: Epidemiology of the Early Mortality Syndrome (EMS) /Acute Hepatopancreatic Necrotic Disease (AHPND)		11,000	8,800	8,800	8,800	8,800
Activity 5: Technology extension and demonstration		15,000	14,000	14,000	24,000	14,000
Activity 6: Publication		0	0	0	0	0
Activity 7: Annual progress meeting and international workshop	Sub-activity 7.1: Annual progress meeting	5,000	4,000	4,000	4,000	0
	Sub-activity 7.2 : International workshop	0	0	0	0	0
Activity 8: Coordination by the project leader		6,438	4,159	5,000	5,000	5,510
	Sub-Total Budget	81,438	66,159	67,000	103,000	65,510

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Activity 1 Preliminary infection experiment for the determination of LD₅₀ for the 4 weight ranges has been conducted. The time course experiments were conducted to determine the threshold levels of WSSV infection using 4 weight ranges have been completed. Standard curve has been established using WSSV plasmid. Threshold infection level for WSSV has been determined. The time course experiment on AHPND using the three (3) body weight ranges (ABW= 3-5g, 15-18g, 20g-up) was already conducted. The standard curve for the real-time PCR was established.

Activity 2.1 The field efficacy of the inactivated nervous necrosis virus (NNV) vaccine against viral nervous necrosis (VNN) in grouper (*Epinephelus coioides*) was verified as evidenced by the upregulation of NNV-neutralizing antibodies in the sera of vaccinated fish examined at different time points post-vaccination coupled by the conferment of protection, *i.e.* higher survival rate, in vaccinated fish challenged with the homologous NNV. On the contrary, NNV-neutralizing antibodies were not detected in surviving and dead unvaccinated fish. Additionally, high NNV titers (>10⁹ TDID₅₀/g) were quantified in the brains of dead unvaccinated fish.

Activity 2.2 Effective dose and frequency of oral administration via feeding as well as optimum ratio of dsRNA to rVP28 were determined. Verification of results in a pond trial is ongoing.

Activity 3 Efficacy of orally administered garlic extract using allicin powder against *Trichodina* sp. in Nile tilapia has been tested and the efficacy of garlic extract against infection with sealice in pompano has been conducted.

Activity 4 Efficacy of aged seawater against AHPND was evaluated.

Activity 5 On-site training courses are conducted in Myanmar and Cambodia in the last quarter of 2019. Annual and semi-annual progress meetings were conducted every year.

Activity 7 The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was conducted at Iloilo city, 25-27 June 2019.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Development and acceleration of rapid and effective fish and shrimp health management	Research				8,800
Activity 2 Enhancement of efficacy of vaccine treatment in tropical cultured species					
Sub-activity 2.1 Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish					
Sub-activity 2.2: Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	Research		11 (5)		4,000
Activity 3: Establishment of protective measures against persistent and emerging parasitic	Research				

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
diseases of tropical fish					
Activity 4: Epidemiology of the Early Mortality Syndrome (EMS) /Acute Hepatopancreatic Necrotic Disease (AHPND)					
Activity 5 Technology extension and demonstration	II: Training Not applicable at the moment.				14,000
Activity 6: Publication					
Activity 7: Annual progress meeting and international workshop	Workshop	19 (7)	33 (14)	1 (0)	0

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Development and acceleration of rapid and effective fish and shrimp health management	Determination of threshold infection levels for WSSV and other pathogens such as VP _{AHPND} at different age/weight ranges	<p>Standard curve has been established using WSSV plasmid. Load of the viral stock was determined using q-PCR to be 1.6×10^7 copies/g. The viral load from natural infection was also measured. Viral load for one-step positive tissues ranges from 3.2×10^9 to 5.1×10^{10} copies/g while the range for the nested positive tissues were from 7.4×10^3 to 1.2×10^5 copies/g. In the artificial infection (time course experiment), the one-step positive tissues range from 1.2 to 5.1×10^9 copies/g while the range for nested is from 3.3 to 9.3×10^6 copies/g. The threshold level of infection for WSSV was between 10^5 and 10^7 copies/g where mortality is not yet observed. The results also show that threshold level of infection for WSSV is not weight dependent. It should be noted however, that clinical signs of WSSV such as white spots were not observed in the artificial infection experiment. The q-PCR protocol was optimized in TF 5. The protocol was successful and can be used for diagnostic purposes</p> <p>For AHPND, the time course experiments for the three (3) body weight ranges (ABW= 3-5g, 15-18g, & 20g-up) were already conducted. The time course experiment for the last body weight range (ABW= 7-8 g) will be conducted in the last quarter of 2019. The refinement of the standard curve for the real-time PCR is still ongoing. The standard curve samples were already established.</p>
Activity 2 Enhancement of efficacy of vaccine treatment in tropical cultured species		

Planned activity	Expected outcome/output	Achievements
<p>Sub-activity 2.1 Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish</p>	<p>Field efficacy of formalin-inactivated NNV vaccine elucidated in pond-reared groupers</p>	<p>Grouper juveniles (MBW: 8.3±1.2 g) intraperitoneally injected with 100 µl of inactivated NNV vaccine (pre-inactivation titer: 10^{9.2} TCID₅₀/ml) exhibited neutralizing antibody titers from Day 30 (mean titer 1:1792±701) to Day 150 (1:704±351) with the highest titer observed at Day 60 (1:6656±3435) post-vaccination. Because no mortality was encountered in both vaccinated and unvaccinated fish during the course of the pond experiment, Day 30 post-vaccinated (n=20; MBW: 21±3.4 g) and L15-injected/control (n=20; 20.6±1 g) fish were intramuscularly challenged with NNV (10^{6.5} TCID₅₀/fish). Nil and 25% mortality were respectively obtained in both vaccinated and unvaccinated fish. NNV titers in the brains and kidneys of dead unvaccinated fish ranged from 10^{10.9}~10^{11.4} TCID₅₀/g and 10⁸~10^{8.9} TCID₅₀/g, respectively. On the contrary, NNV was not detected in the brains and kidneys of any vaccinated fish examined. Additionally, NNV-challenge of Day 120 vaccinated (n=20; 178±27 g) and L15-injected/control (n=20; 176±19 g) fish likewise resulted in nil mortality, suggesting an age or weight dependent susceptibility to NNV.</p> <p>Recently, IM injection of sublethal dose of NNV in pompano juveniles (MBW: 4.7±1.7 g) resulted in 0~15% mortality rate. When these surviving fish were re-challenged with a lethal dose of NNV at 1 and 2 months post-primary sublethal NNV injection, none of these fish died nor manifested any VNN associated symptoms/ signs. On the contrary, control (naïve) fish groups resulted in 70~80% mortality rates. Determination of antibody and NNV titers in the sera of fish (primary and post-NNV challenge) collected at different point post-NNV injection and brains of dead fish, respectively, is ongoing. Current findings indicate that in natural NNV infection, upregulation and subsequent proliferation of anti-NNV neutralizing antibodies play an important role in suppressing or controlling the progression of the disease.</p>
<p>Sub-activity 2.2 Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV</p>	<p>To develop a vaccination scheme using a combination of the two antiviral treatments (rVP28 vaccination and rVP28 RNAi treatment).</p> <p>To develop a low-cost delivery protocol for the antiviral treatments in tanks.</p>	<p>dsRNA was produced using a low-cost bacterially expressed dsRNA production method. The efficacy of dsRNA was tested in several challenge experiments using various dsRNA doses, different frequency of dsRNA administration, and inclusion of heterologous dsRNA to test the specificity of gene silencing. The best treatment was determined to be a dose of 20 µg/shrimp administered 4 times over 28 days (total = 80 µg/shrimp). Furthermore, the silencing was found to be specific to VP28 dsRNA. Moreover, production of rVP28 and dsRNA and determination of their encapsulation efficiency and yield in chitosan and alginate microparticles were conducted. In 2019, optimum ratio of dsRNA to rVP28 in microparticle carriers was determined to be 1:3. Pond trial to verify the above results is ongoing.</p>

Planned activity	Expected outcome/output	Achievements
Activity 3 Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	1) To test the efficacy orally administered garlic (<i>Allium sativum</i>) extract (allicin powder) against <i>Trichodina</i> sp. in Nile tilapia (<i>Oreochromis niloticus</i>). 2) To assess the ability of efficacy of garlic extract against infection with sea lice (<i>Caligus</i> sp.) in pompano (<i>Trachinotus blochii</i>).	1) Results showed that tilapia fed with allicin powder-supplemented diets showed significant reduction in the prevalence and mean intensity of ciliate parasites (<i>Trichodina</i> sp.) as compared to the control. Histopathological changes such as fragmented muscle and disarranged collagen bundle along the muscle of tilapia fed positive control were seen. Gills of fish fed with control diet showed hyperplasia and fusion of gill lamellae. Liver of tilapia fed with Diet 5 (5g/kg) showed congestion and vacuolation of the hepatocytes. In vitro results of garlic extract (allicin powder) efficacy testing on <i>Trichodina</i> revealed that the time required for killing of <i>Trichodina</i> parasites at lowest concentration (150 ppm) was 45 mins. However, at the highest concentration (400 ppm) it required 10 mins to kill all parasites. Bath treatment will be conducted upon the availability of infested tilapia with Trichodinids. 2) On the other hand, toxicity trials were performed to determine the concentration of garlic extract as therapeutic immersion treatment for sea lice in pompano (<i>Trachinotus blochii</i>). Results yielded from the experiment showed that the median lethal concentration (LC50) of allicin powder to pompano for 24, 48, 72 and 96 h of exposure were 29.18, 23.31, 16.79 and 6.64 mg/L respectively. Histopathology revealed that the gills of <i>T. blochii</i> in the control group showed no signs of abnormalities while the gills of test fish with the supplemented garlic extract diet showed epithelial lifting, hyperplasia, and fusion of the secondary lamellae. While the liver of test fish in the control group showed vacuolation of the hepatocytes, the liver of fish fed with supplemented garlic extract diet, on the other hand, showed severe congestion of blood vessels and vacuolation, pyknosis and dilations of sinusoids. <i>In-vitro</i> parasite survival experiment, oral treatment and bath treatment will be undertaken.
Activity 4 Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)	To clarify the efficiency of green-water system using brown mussel against AHPND in a simulated tank experiment. To investigate other alternative measures that will mitigate the effect of AHPND aside from the green-water system	The efficiency of raw seawater aged at different periods (28 days, 14 days, 7 days and 0 day) in shrimp with high (one-step PCR positive) and low (nested PCR-positive) VP _{AHPND} infection were investigated. Significantly higher shrimp survival was observed in shrimp with low VP _{AHPND} infection compared to shrimp with high VP _{AHPND} infection. Among shrimp with low VP _{AHPND} infection, higher survival was observed in those maintained in seawater aged for 14-28 days (70% and 63%, respectively) compared to those maintained in seawater aged for 7 days (48%) and non-aged seawater (39%). Survival in shrimp with high infection maintained in 0 to 4 days ranged from 8.4 to 19%. Experiment to clarify the effect of brown mussel was not done due to the lack of brown mussel source.
Activity 5 Technology extension and demonstration	On-site training courses on basic fish bacteriology,	Coordination with the DOF of Myanmar to conduct an on-site training that specifically focuses on issues pertinent bacterial aeromonad septicemia in cultured

Planned activity	Expected outcome/output	Achievements
	antimicrobial assay and disinfection techniques implemented in Cambodia and Myanmar	freshwater fish species is currently being undertaken. The target date of training will be in November 2019.
Activity 6: Publication	To print proceedings for workshop	The proceedings of International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” to be printed in first quarter of 2020.
Activity 7: Annual progress meeting and international workshop	To hold international workshop	The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was conducted at Iloilo city from 25-27 June, 2019. There were fifty-three participants. Nineteen participants from Member Countries, one participant from other country and thirty-three participants from SEAFDEC were attended. The participants also reported on the status of sustainable aquaculture, resource enhancement and aquatic animal health of their respective countries. The participants could be updated on the issues related to sustainable aquaculture, aquatic animal health and resource enhancement, and will put forward recommendations to address the issues.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
1. Pakingking Jr.,R, Bautista, NB and de Jesus-Ayson, EG (2018) Characterization of <i>Vibrio</i> isolates recovered from the eyes of cage-cultured pompano (<i>Trachinotus blochii</i>) infested with caligid parasites (<i>Lepeophtheirus spinifer</i>). Bulletin of the European Association of Fish Pathologists 38 (1): 35-41	Journal publication	
2 Pakingking Jr., Rolando, de Jesus-Ayson, Evelyn Grace, Reyes, Ofelia, Bautista, Norwell Brian (2018) Immunization regimen in Asian sea bass (<i>Lates calcarifer</i>) broodfish: a practical strategy to control vertical transmission of nervous necrosis virus during seed production. Vaccine 36: 5002–5009	Journal publication	
3. R Pakingking Jr. R. (2018) Immunization regimen in high value marine broodfish: a pragmatic strategy to control vertical transmission of nervous necrosis virus during seed production (Oral Presentation) Asian Aquaculture 2018: Celebrating Asian Aquaculture, Asian Institute of Technology Convention Center, Klong Luang, Pathumthani, Thailand, 3-6 December 2018	Book of Abstract	
4. Leobert D. de la Peña (2019) Establishment of Threshold Infection Levels for WSSV and Other Pathogens such as VP _{AHPND} in Penaeid Shrimp. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.	Book of Abstract	
5. Rolando Pakingking Jr. and Evelyn Grace de Jesus-Ayson (2019) Enhancement of Vaccine Efficacy for the Prevention of Viral Nervous Necrosis in High Value Marine Fish. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource	Book of Abstract	

List of completed publications for the year 2019	Type of media	Attached e-file
Enhancement in Southeast Asia (SARSEA 2019)", 25-27 Jun 2019, Iloilo Philippines.		
6. Edgar C. Amar (2019) Application of Adjuvants, Carriers and RNAi to Enhance the Antiviral Immune Response of Shrimp to WSSV. Presented at the International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)", 25-27 Jun 2019, Iloilo Philippines.	Book of Abstract	
7. Gregoria Erazo-Pagador (2019) Establishment of Protective Measures Against Persistent and Emerging Parasitic Diseases of Tropical Fish. Presented at the International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)", 25-27 Jun 2019, Iloilo Philippines.	Book of Abstract	
8. Eleonor A. Tendencia (2019) Epidemiology of the Early Mortality Syndrome (EMS). Presented at the International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)", 25-27 Jun 2019, Iloilo Philippines.	Book of Abstract	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1 Development and acceleration of rapid and effective fish and shrimp health management	Not applicable
Activity 2 Enhancement of efficacy of vaccine treatment in tropical cultured species	
Sub-activity 2.1 Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	Not applicable
Sub-activity 2.2: Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	Not applicable
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	Not applicable
Activity 4: Epidemiology of the Early Mortality Syndrome (EMS) /Acute Hepatopancreatic Necrotic Disease (AHPND)	Not applicable
Activity 5 Technology extension and demonstration	Not applicable at the moment. To be conducted Dec. 2016
Activity 6: Publication	
Activity 7: Annual progress meeting and international workshop	The International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)" was highly evaluate from Participants (average mark was 4.6 out of 5).

6. Major Impacts/Issues

Activity 2.1) Unprecedented outbreaks of VNN in pond-reared groupers, particularly at the juvenile stages, could be avoided since single administration of the monovalent inactivated NNV vaccine effectively upregulated the production of NNV-neutralizing antibodies and concomitant conferment of protection against VNN. Moreover, the use of the inactivated vaccine in other warm-water marine fish species such as sea bass and pompano is highly feasible since VNN-induced mortalities in these fish species have been found to be caused by NNV strains belonging to a single genotype, *i.e.* RGNNV type.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

Activity 1 Determination of threshold infection levels for WSSV in shrimp at different ages/weight ranges were already established. The established threshold level will enable the farmers to strictly monitor the health status so that early and effective intervention strategies can be implemented and will serve as a reference in the monitoring and diagnostic schemes in the farm level, if it is still safe or dangerous. The study already completed the establishment of threshold infection level for the WSSV while for VP_{AHPND}, a few more activities are needed to finish the study at the end of 2019.

Activity 2.1 Single administration of the monovalent formalin-inactivated NNV vaccine in pompano and groupers was proven effective in upregulating the production of NNV-neutralizing antibodies and concomitant conferment of protection against VNN. Moreover, the potential use of this inactivated vaccine against NNV infection in other susceptible warm-water marine fish species particularly during the early phase of grow-out culture in earthen ponds or floating net-cages in the open sea is very much feasible since mortalities of these fish species have been found to be caused by NNV strains belonging to a single genotype, *i.e.* RGNNV type. Additionally, current trial, *i.e.* IP injection of sublethal dose of NNV in pompano juveniles followed by subsequent injection with a lethal dose of NNV at 1 and 2 months post-primary sublethal NNV injection, resulted in nil mortality coupled by the absence of any VNN associated symptoms/ signs; contrary to the control (naïve) fish which resulted in 70~80% mortality rates. Although determination of antibody and NNV titers in the sera of fish (primary and post-NNV injection) collected at different time points post-NNV injection and brains of dead fish, respectively, is still ongoing, current findings clearly indicate that in fish naturally infected with NNV, the humoral immune response plays an important or perhaps major role in suppressing or controlling the proliferation of NNV in the nervous tissues of infected fish, thereby abrogating the progression of the disease. The potentiality of using this approach as a practical vaccination strategy against NNV infection in susceptible fish species warrants further investigation.

Activity 2.2 dsRNA was produced using a low-cost bacterially expressed dsRNA production method. The optimum dose was determined to be 20 µg/shrimp administered 4 times over 28 days (total = 80 µg/shrimp). Furthermore, the silencing was found to be specific to VP28 dsRNA. The encapsulation efficiency and yield in chitosan and alginate microparticles were found to be adequate. The dsRNA to rVP28 ratio in microparticle carriers was determined to be 1:3. Pond trial to verify the above results is ongoing.

Activity 3 Experimental transmission of gill monogenean *Pseudorhabdosynochus lantauensis* on cultured orange spotted grouper (*Epinephelus coiodes*) fingerlings was conducted. The study also examined the anti-parasitic effect of garlic (*Allium sativum*) powder extract (allicin) against gill monogenean parasites (*P. lantauensis*), ciliates (*Trichodina* sp.) and sea lice (*Lepeoptheirus spinifer*, *Caligus* sp.) infecting grouper (*E. coiodes*), Nile tilapia (*Oreochromis niloticus*) and pompano (*Trachinotus blochii*) respectively. The efficacy of garlic extract was tested *in vitro* and *in vivo*. In addition, treatment of infected fish with garlic-supplemented diets was carried out. Histopathology of gills, liver, and kidney from the *in vitro* and oral treatments were analyzed. The hematocrit, hemoglobin, RBC count, WBC count, and WBC differential count of infected and uninfected fish: *E. coioides*, *O. niloticus* and *T. blochii* were also undertaken.

Activity 4 One of the most recent diseases affecting the shrimp industry is the early mortality syndrome (EMS). EMS characterized by observed mortality in shrimp within the first 35 days of culture is due to several diseases, one of which is the acute hepatopancreatic disease (AHPND). Re Immersion in 10⁷ cfu/ml VP_{AHPND}, either in the culture water or in a bacterial suspension for 15 minutes, can cause mortality

in healthy shrimp. Tank experiments done suggested that exposure to 35°C, 28ppt and 10 ppt increase the risk of shrimp mortality due to VP_{AHPND}. On the other hand, use of green water that has been stocked with siganid for not less than 2 weeks might provide some protection against the disease. Use of siganid water to culture shrimp improves shrimp growth and survival. Use of mussel may also improve shrimp survival but needs further investigation; whereas, the use of macro algae is not effective against VP_{AHPND}. Use of seawater aged for not less than 14 days may improve survival in shrimp with low VP_{AHPND} infection but in those with high VP_{AHPND} infection.

Activity 5 The on-site training courses conducted in Myanmar, Cambodia and Lao PDR primarily delved on health management of parasitic and bacterial diseases of cultured freshwater fish species. Because of the series of on-site trainings conducted, fish health staff (FHS) have been capacitated with the necessary knowledge and skills needed for the accurate laboratory diagnosis of bacterial and parasitic diseases affecting cultured freshwater fish species. Lectures focusing on major bacterial and parasitic diseases affecting cultured freshwater fishes in Myanmar, Cambodia and Lao PDR enabled fish health personnel to keep abreast with the latest issues on persistent and emerging transboundary diseases of aquatic organisms in the region. The theoretical knowledge acquired by the trainees have been further enhanced by the skills they learned from the hands-on exercises such as necropsy, parasite identification, bacteriological techniques including asepsis, biochemical characterization tests, in vitro drug sensitivity test, and infection bioassay among others. Notably, several staff from the DOF, academe, and other government and private agencies was able to avail of the on-site training courses by far conducted.

Activity 7 Annual and semi-annual progress meeting were conducted. The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was conducted in 2019.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1 Development and acceleration of rapid and effective fish and shrimp health management	Earlier, optimization of the protocols for conventional and real-time PCR was conducted. The optimized protocols were used in the determination of the threshold levels for WSSV and AHPND. Preliminary infection experiment for the determination of LD ₅₀ for the 4 weight ranges has been conducted. The time course experiments were conducted to determine the threshold levels of WSSV infection using 4 weight ranges have been completed. Standard curve has been established using WSSV plasmid. Threshold infection level for WSSV has been determined. The time course experiment on AHPND using the three (3) body weight ranges (ABW= 3-5g, 15-18g, 20g-up) was already conducted. The standard curve for the real-time PCR was established. These optimized protocols can be used in the detection of the target pathogens under the Diagnostic Services of the Fish Health Section.
Activity 2 Enhancement of efficacy of vaccine treatment in tropical cultured species	
Sub-activity 2.1 Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	The field efficacy of the previously developed inactivated Philippine strain of NNV vaccine was pilot tested in pompano reared in floating net cages in the open sea and in groupers reared in earthen ponds. The efficacy of the inactivated NNV vaccine, <i>i.e.</i> its immunogenicity and ability to confer protection against NNV infection, was clearly elucidated in these fish species, particularly in groupers, as evidenced by the presence of neutralizing antibodies in the sera of vaccinated fish examined at different time points post-vaccination. Moreover, when groupers were experimentally challenged with the homologous virus, higher survival rate was obtained in vaccinated fish compared with the control fish coupled by the absence and very high ($\geq 10^9$ TCID ₅₀ /g) NNV titers in the brains of vaccinated fish and unvaccinated fish, respectively. Recently, the potentiality of using sublethal dose of NNV as practical vaccination strategy in pompano juveniles was conducted. IM injection of sublethal dose of NNV in pompano juveniles resulted in 0~15% mortality rate. None of these surviving fish re-challenged

List of Activities	Description of Implemented Activities
	with a lethal dose of NNV at 1 and 2 months post-primary sublethal NNV injection died nor manifested any VNN associated symptoms/signs, contrary to 70~80% mortality rates obtained for control (naïve) fish groups. Determination of antibody and NNV titers in the sera of fish (primary and post-NNV challenge) collected at different point post-NNV injection and brains of dead fish, respectively, is ongoing.
Sub-activity 2.2: Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	The efficacy of dsRNA treatments in protecting shrimp against WSSV was evaluated. Then, a scheme combining the two antiviral treatments (rVP28 vaccination and rVP28 RNAi) was developed, including a low-cost delivery protocol for the antiviral treatments in tanks. A field trial using orally (feed)- delivered antiviral treatments is ongoing.
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	Experimental transmission of <i>P. lantauensis</i> in <i>E. coioides</i> juveniles showed 100, 80.0, 53.3% mortality in 10 fish/20L challenged with 800, 400 and 200 oncomiracidia, respectively, at day 4 post-challenge. No mortality was observed in fish infected with 100 oncomiracidia and the control (0 oncomiracidium). Histopathological analysis showed extensive hyperplasia and hypertrophy in the gill filaments of infected grouper challenged with 800 oncomiracidia. Hematological analysis revealed that hematocrit, hemoglobin and red blood cell were lower in infected fish than healthy individuals. In contrast, number of white blood cells was higher in infected fish compared to non-infected fish. The anti-parasitic effect of garlic (<i>Allium sativum</i>) extract (allicin powder) against monogenean parasites (<i>P. lantauensis</i>) showed that the 96 h (LC ₅₀) of garlic extract for 24, 48, 72 and 96 h of exposure are 6.24, 5.94, 5.15 and 3.659 ml/L respectively. <i>In vitro</i> trials revealed that at 2.5 ppm garlic extract, parasites detached and died at 20 and 40 min respectively, whereas, at 30 ppm, detachment and death occurred at 5 and 10 min respectively. Oral treatment of garlic (<i>A. sativum</i>) against <i>P. lantauensis</i> showed that fish fed with diets supplemented (0.10%, 0.50% and 1.0% allicin powder) showed reduced prevalence and mean intensity of parasites as compared to the control. Effect of garlic extract (allicin powder) as antiprotozoal to control trichodinosis in tilapia (<i>Oreochromis niloticus</i>) showed the LC ₅₀ values of garlic extract for 24, 48, 72 and 96 hours were 398.1, 360.7, 316.21 and 208.95 ppm respectively. Oral treatments using allicin powder-supplemented diet showed that tilapia fed with allicin showed reduced prevalence of <i>Tilapia sp.</i> infection as compared to the control <i>i.e.</i> 1.25, 2.5, 3.75 and 5 g/kg were 72%, 65%, 56%, 37% respectively, as compared to 100% in the control. Mean intensity of <i>Tilapia sp.</i> was reduced in fish fed with allicin diets as compared to the control. Histopathological analysis was conducted. Results showed that hematocrit, hemoglobin and red blood cell count were lower in infected fish than in healthy individuals. White blood cell count was higher in infected fish compared to non-infected fish. <i>In vitro</i> results of garlic extract (allicin powder) on <i>Trichodina</i> revealed that the time required for killing of <i>Trichodina</i> parasites at lowest concentration (150 ppm) was 45 mins. and at 400 ppm was 10 mins. Efficacy of garlic (<i>A. sativum</i>) extract as ant-parasitic against sea lice on pompano (<i>Trachinotus blochii</i>) showed that (LC ₅₀) values for 24, 48, 72 and 96 h of exposure were 29.18, 23.31, 16.79 and 6.64 mg/L respectively. Analysis of histopathology was conducted. <i>In-vitro</i> parasite survival experiment, oral treatment and bath treatment will be undertaken.
Activity 4 Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)	Tanks experiments were done to determine infection method to be used in the investigation of VP _{AHPND} risk factors and possible control measures. Based on farm reports, the role of different temperatures and salinities in shrimp mortalities due to VP _{AHPND} were investigated. Possible protective measures investigated were green water using siganid, macro algae and brown mussels; and the use of aged seawater.
Activity 5 Technology	The first on-site training course focusing on health management of

List of Activities	Description of Implemented Activities
extension and demonstration	<p>parasitic diseases of freshwater fish species was conducted at the Aquatic Animal Health Disease Controlling Section, DOF, Tharketa, Yangon, Myanmar last 18 to 22 January 2016. The theoretical and practical aspects of the training mainly delved on major parasitic diseases affecting cultured freshwater fishes in Myanmar. Because bacterial infections persistently affect freshwater fishes cultured in earthen ponds and reservoir, DOF's request to conduct a follow up on-site training course focusing on basic bacteriological techniques was realized from 7 to 11 November 2016. Lectures covered major bacterial diseases of freshwater fishes while hands-on exercises including bacterial isolation, purification, characterization, and infection bioassay were carried out.</p> <p>The third on-site training course focusing on health management of parasitic diseases was conducted from 6 to 10 December 2016 at the Fish Health Laboratory, Marine Research and Development Center (MARDeC), Sihanoukville, Cambodia, as per request of its country representative during the SEAFDEC council meeting. Lectures and hands on exercises respectively focused on major bacterial and parasitic diseases and parasite detection in freshwater fishes.</p> <p>Additionally, as per Lao PDR's request, a similar on-site training course focusing on health management of parasitic diseases was conducted from 20 to 24 November 2017 at Namxoung Aquaculture and Development Center (NADC), Lao PDR. Lectures delved on major bacterial and parasitic diseases of cultured freshwater fishes while hands-on exercises including fish necropsy, quantitative determination of parasite load, and identification. Updates on tilapia lake virus infection, an emerging and pressing problem besetting the tilapia aquaculture industry in Asia was also presented. Notably, the said training was featured in a national TV news program and national newspaper.</p>
Activity 6: Publication	The proceedings of International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)" to be printed in first quarter of 2020.
Activity 7: Annual progress meeting and international workshop	Annual and semi-annual progress meeting were conducted every year. The International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)" was conducted at Iloilo city from 25-27 June, 2019.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1 Development and acceleration of rapid and effective fish and shrimp health management	The determination of threshold infection levels for WSSV in shrimp at different ages/weight ranges will enable the farmers to strictly monitor the health status so that early and effective intervention strategies can be implemented and will serve as a reference in the monitoring and diagnostic schemes in the farm level, if it is still safe or dangerous.
Activity 2 Enhancement of efficacy of vaccine treatment in tropical cultured species	
Sub-activity 2.1 Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	Pompano juveniles (MBW: 5.7±0.4 g) were intraperitoneally (IP) vaccinated with inactivated NNV (pre-inactivation titer of 109.2 TCID ₅₀ / ml) and reared in floating net cages in the open sea. Fish injected with L-15 medium served as control. Vaccinated fish exhibited neutralizing antibodies as early as Day 30 (1:1493±498), peaked at Day 60 (4267±1260), but

List of Activities	Achievements and Outcomes/Outputs of Activities
	<p>thereafter gradually declined at Day 195 (453±203) and Day 210 (293±178) (harvest). On the contrary, all control fish examined did not possess NNV neutralizing antibodies (<1:40). However, protective effect of vaccine-induced antibodies could not be demonstrated since natural NNV infection was not encountered during the course of the experiment. Thus, the field efficacy of the vaccine was subsequently tested in groupers, a highly susceptible species to VNN.</p> <p>Grouper juveniles (MBW: 8.3±1.2 g) intraperitoneally injected with 100 µl of inactivated NNV vaccine (pre-inactivation titer: 109.2 TCID₅₀/ml) exhibited neutralizing antibody titers from Day 30 (mean titer 1:1792±701) to Day 150 (1:704±351) with the highest titer observed at Day 60 (1:6656±3435) post-vaccination. Because no mortality was encountered in both vaccinated and unvaccinated fish during the course of the pond experiment, Day 30 post-vaccinated (n=20; MBW: 21±3.4 g) and L15-injected/control (n=20; 20.6±1 g) fish were intramuscularly challenged with NNV (106.5 TCID₅₀/fish). Nil and 25% mortality were respectively obtained in both vaccinated and unvaccinated fish. NNV titers in the brains and kidneys of dead unvaccinated fish ranged from 1010.9~1011.4 TCID₅₀/g and 108~108.9 TCID₅₀/g, respectively. On the contrary, NNV was not detected in the brains and kidneys of any vaccinated fish examined. Additionally, NNV-challenge of Day 120 vaccinated (n=20; 178±27 g) and L15-injected/control (n=20; 176±19 g) fish likewise resulted in nil mortality, suggesting an age or weight dependent susceptibility to NNV.</p> <p>Recently, IM injection of sublethal dose of NNV in pompano juveniles (MBW: 4.7±1.7 g) resulted in 0~15% mortality rate. When these surviving fish were re-challenged with a lethal dose of NNV at 1 and 2 months post-primary sublethal NNV injection, none of these fish died nor manifested any VNN associated symptoms/ signs. On the contrary, control (naïve) fish groups resulted in 70~80% mortality rates. Determination of antibody and NNV titers in the sera of fish (primary and post-NNV challenge) collected at different points post-NNV injection and brains of dead fish, respectively, is ongoing. Current findings indicate that in natural NNV infection, upregulation and subsequent proliferation of anti-NNV neutralizing antibodies play an important role in suppressing or controlling the progression of the disease.</p>
<p>Sub-activity 2.2 Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV</p>	<p>dsRNA was successfully expressed and produced using <i>E. coli</i> cells. Several dsRNA doses (0.2, 10, 20, 80, and 120 µg/shrimp) and administration frequencies (1x, daily for 28 d; 4x, and 8x) were tested for protective efficacy against WSSV by challenge experiments. Based on the results of 3 trials, the best treatment was a dose of 20 µg/shrimp administered over 28 days 2 times before and 2 times after challenge (total=80 µg/shrimp). The silencing was specific to VP28 dsRNA. Further tank trials determined that oral delivery using microparticles to encapsulate dsRNA and rVP28 at a 1:3 ratio was the most effective in reducing mortalities upon WSSV infection. A DBS pond trial is being undertaken to confirm results of tank studies and to demonstrate the practicability of the technique under farm conditions.</p>

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	Factors associated with the susceptibility or resistance of fish to some parasitic infection was elucidated. Disease transmission cycle in fish established. Hematological profile of parasites-infected and uninfected fish determined. Practical strategies for the prevention of parasite infestation in fish formulated.
Activity 4 Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)	Based on the results of the 2 infection methods investigated, immersion in 10^7 cfu/ml VP _{AHPND} , either in the culture water or in a bacterial suspension for 15 minutes, can cause mortality in healthy shrimp. Thus, for the challenge experiments, shrimp was immersed in 10^7 cfu/ml VP _{AHPND} bacterial suspension for 15 min; this needed smaller volume of bacterial suspension compared to adding bacterial suspension to culture water to a final concentration of 10^7 cfu/ml. Results of the tank experiments suggested that 35°C, 28ppt and 10 ppt increase the risk of shrimp mortality due to VP _{AHPND} . On the other hand, use of greenwater that has been stocked with siganid for not less than 2 weeks might provide some protection against the disease. Use of siganid water to culture shrimp improves shrimp growth and survival. Use of mussel may also improve shrimp survival but needs further investigation; whereas, the use of macro algae is not effective against VP _{AHPND} . Use of seawater aged for not less than 14 days may improve survival in shrimp with low VP _{AHPND} infection but in those with high VP _{AHPND} infection.
Activity 5 Technology extension and demonstration	<p>Four on-site training courses have by far been conducted, <i>i.e.</i> 2 in Myanmar (1st and last quarter of 2016), 1 in Cambodia (last quarter of 2016), and 1 in Lao PDR (last quarter of 2017). The themes of the trainings already conducted in these aforementioned countries were in conjunction with the requests, <i>i.e.</i> based on identified needs or problems on persistent or emerging fish diseases, of the concerned SEAFDEC member country representatives. The follow up on-site training on basic bacteriological techniques supposedly scheduled for 2018 in Cambodia was not implemented due to the delayed approval of the proposal. To date, a total of 57 individuals have attended the on-site training conducted in Myanmar (n=31), Cambodia (11), and Lao PDR (15).</p> <p>An on-site training course on Health management of bacterial and parasitic diseases of freshwater fish species was successfully carried out at the Aquatic Animal Health Disease Controlling Section, DOF, Tharketa, Yangon, Myanmar from 18 to 22 January 2016. Eleven FH officers participated in the training. The theoretical and practical aspects of the training primarily focused on major parasitic diseases affecting cultured freshwater fishes in Myanmar. Because bacterial infections have been recognized as a serious problem among freshwater fish species cultured in earthen ponds and reservoir in Myanmar, a follow up on-site training delving on Basic Bacteriological Techniques was implemented from 7 to 11 November 2016. A total of 20 participants, <i>i.e.</i> 15 and 5 from the DOF and academe (Yangon University), respectively, attended the training and proposal writing workshop. Lectures covered major bacterial diseases of freshwater fishes while hands-on exercises included bacterial isolation, purification, characterization, and infection bioassay.</p> <p>As per request of Cambodia's country representative, an on-</p>

List of Activities	Achievements and Outcomes/Outputs of Activities
	<p>site training focusing on Parasitic Diseases of Freshwater Fishes was conducted from 6 to 10 December 2016 at the Fish Health Laboratory of the Marine Research and Development Center (MARDeC), Sihanoukville, Cambodia. Staff of the Department of Aquaculture Development (n=5), National Aquaculture Research and Development Institute (2), Freshwater Aquaculture and Development Center (2), and MARDeC (2) participated in the training.</p> <p>Additionally, as per Lao PDR's request, a similar on-site training course focusing on Parasitic Diseases of Freshwater Fishes was conducted from 20 to 24 November 2017 at Namxoung Aquaculture and Development Center (NADC), Namxoung, Lao PDR. A total of 15 participants, <i>i.e.</i> NADC (n=3); National Animal Health Laboratory (1); Dongkhamxang Agriculture Technical School (2); Living Aquatic Resources Research Center (2); Lao - Singapore Demonstration Fish Hatchery (2); Vientiane Province Technical College (VPTC) (2); National University of Lao PDR (1); Army Agriculture Center (2); and students from VPTC (3) attended the training. Lectures highlighted the major bacterial and parasitic diseases currently affecting cultured freshwater fishes in SE Asia. Hands-on exercises delved on fish necropsy, quantitative determination of parasite load in the gills and skin of fish and parasite identification. Additionally, updates on tilapia lake virus infection, an emerging and pressing problem currently besetting the tilapia aquaculture industry in Asia was presented. Notably, the said training was featured in a national TV news program and national newspaper.</p>
Activity 6: Publication	
Activity 7: Annual progress meeting and international workshop	<p>Annual and semi-annual progress meeting were conducted every year, it contributed for proper practice of the project. The International workshop on "Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)" was conducted at Iloilo city from 25-27 June, 2019. There were fifty-three participants. Nineteen participants from Member Countries, one participant from other country and thirty-three participants from SEAFDEC were attended. The participants also reported on the status of sustainable aquaculture and resource enhancement and aquatic animal health of their respective countries. The participants could be updated on the issues related to sustainable aquaculture, aquatic animal health and resource enhancement, and will put forward recommendations to address the issues.</p>

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Activity 2.2 Low cost delivery and enhanced efficacy are needed in enhancing the resistance of shrimp by the application of immune stimulating or virus-inhibiting compounds in shrimp aquaculture. These interventions are often shown to be efficacious in *in vitro* and tank trials but field trials are mostly non-existent. Adoption by farmers can be facilitated when these interventions are verified under field conditions. Field trials are expensive to conduct. The project plans to recycle harvest income to pay for some inputs like feeds and life support systems.

Activity 3 The results of this study demonstrated the potential of garlic as a natural alternative to the current use of chemical treatments for parasitic infestations in tropical fish.

Activity 7 The International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)” was highly evaluate from Participants (average mark was 4.6 out of 5).

The participants could be updated on the issues related to sustainable aquaculture, aquatic animal health and resource enhancement, and will put forward recommendations to address the issues.

5. Publications and Others

Maria Rowena R. Romana-Eguia, Fe D. Parado-Esteva, Nerissa D. Salayo and Ma, Junemie Hazel Lebata-Ramos edit. (2015) Resource Enhancement and Sustainable Aquaculture Practices in Southeast Asia (RESA2014). Proceedings of the international Workshop, ISBN: 978-971-9931-04-1, SEAFDEC AQD

Pakingking Jr. R. Aquatic Animal Health Activities of the Fish Health Section, SEAFDEC/AQD. NACA 2015. Fourteenth Meeting of the Asia Regional Advisory Group on Aquatic Animal Health: Report of the Meeting. Published by the Network of Aquaculture Centres in Asia-Pacific, Bangkok, Thailand.

Pakingking Jr. R. Aquatic Animal Health Activities of the Fish Health Section, SEAFDEC/AQD. NACA 2016. Fifteenth Meeting of the Asia Regional Advisory Group on Aquatic Animal Health: Report of the Meeting. Published by the Network of Aquaculture Centres in Asia-Pacific, Bangkok, Thailand.

Pakingking Jr. R., de Jesus-Ayson EG (2016) Supporting ASEAN Good Aquaculture Practices: Preventing the Spread of Transboundary Aquatic Animal Diseases. Fish for the People 2: 76-82.

Tendencia EA, VJ Estilo. (2017) Advocating Preventive Measures that Inhibit Early Mortality Syndrome in Shrimps. Fish for the People 15 (3): 30-36; Bangkok Thailand; ISSN 1685- 6546.

Tendencia EA, VJ Estilo. (2017) Shrimp survives exposure to low *Vibrio parahaemolyticus* AHPND load in the water. Poster presentation and Book of Abstract; 10th Symposium on Diseases in Asian Aquaculture

Pakingking Jr. R. (2017) Aquatic Animal Health Activities of the Fish Health Section, SEAFDEC/AQD. NACA 2017. Sixteenth Meeting of the Asia Regional Advisory Group on Aquatic Animal Health: Report of the Meeting. Published by the Network of Aquaculture Centres in Asia-Pacific, Bangkok, Thailand.

Pakingking Jr. R., de Jesus-Ayson EG, Bautista NB (2017) Ocular vibriosis in cage cultured snubnose pompano *Trachinotus blochii* in the Philippines (Poster Paper Presentation) 10th Symposium on Diseases in Asian Aquaculture, Bali, Indonesia, 28 August to 1 September 2017.

Pakingking Jr.,R, Bautista, NB and de Jesus-Ayson, EG (2018) Characterization of *Vibrio* isolates recovered from the eyes of cage-cultured pompano (*Trachinotus blochii*) infested with caligid parasites (*Lepeophtheirus spinifer*). Bulletin of the European Association of Fish Pathologists, 38 (1): 35-41

Pakingking Jr., Rolando, de Jesus-Ayson, Evelyn Grace, Reyes, Ofelia, Bautista, Norwell Brian (2018) Immunization regimen in Asian sea bass (*Lates calcarifer*) broodfish: a practical strategy to control vertical transmission of nervous necrosis virus during seed production. Vaccine 36: 5002–5009.

Pakingking Jr. R. (2018) Immunization regimen in high value marine broodfish: a pragmatic strategy to control vertical transmission of nervous necrosis virus during seed production (Oral Presentation). Asian Aquaculture 2018: Celebrating Asian Aquaculture, Asian Institute of Technology Convention Center, Klong Luang, Pathumthani, Thailand, 3-6 December 2018

Leobert D. de la Peña (2019) Establishment of Threshold Infection Levels for WSSV and Other Pathogens such as VP_{AHPND} in Penaeid Shrimp. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.

- Rolando Pakingking Jr. and Evelyn Grace de Jesus-Ayson (2019) Enhancement of Vaccine Efficacy for the Prevention of Viral Nervous Necrosis in High Value Marine Fish. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.
- Edgar C. Amar (2019) Application of Adjuvants, Carriers and RNAi to Enhance the Antiviral Immune Response of Shrimp to WSSV. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.
- Gregoria Erazo-Pagador (2019) Establishment of Protective Measures Against Persistent and Emerging Parasitic Diseases of Tropical Fish. Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.
- Eleonor A. Tendencia (2019) Epidemiology of the Early Mortality Syndrome (EMS). Presented at the International workshop on “Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia (SARSEA 2019)”, 25-27 Jun 2019, Iloilo Philippines.

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

		Project ID: 201302001	
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Chemicals and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins (ASP, AZA and BTX) and Harmful Algal Blooms (HABs) in the ASEAN Region		
Program Strategy No.:	III	Total Duration:	2013 - 2019
Lead Department:	Marine Fisheries Research Department (MFRD)	Lead Country:	Singapore
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 274,914
Project Partner:	None	Budget for 2019:	USD 39,850
Project Leader:	Ong Yihang / MFRD	Project Participating Country (ies) :	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Consumption of a variety of shellfish and fish which have been contaminated by marine biotoxins causes an increasing number of human intoxications and even deaths around the world. This project is an extension of the Japanese Trust Fund II project on Biotoxins Monitoring in ASEAN and aims to address the needs of Member Countries and continue with capability building in biotoxins analyses and monitoring, with the proposed focus on other biotoxins like Amnesic Shellfish Poisoning (ASP) toxin (Domoic Acid) and Azaspiracids (AZA). The project will also include a component on the identification of toxic Harmful Algal Blooms (HABs) species. This project will be implemented by Post-Harvest Technology Centre of the Agri-Food and Veterinary Authority of Singapore (PHTC/AVA) as SEAFDEC's Collaborating Center for MFRD programmes, with participation from the ASEAN-SEAFDEC Member Countries. The key project activities comprise of a Regional Technical Consultation meeting, a Regional Training Course in Biotoxins Analyses and a biotoxins monitoring survey. In addition, there will also be a Regional Technical Consultation and Regional Training Course, which will be organized in collaboration with IOC (Intergovernmental Oceanographic Commission of the UNESCO) Sub-Commission for the Western Pacific (WESTPAC), for the identification of toxic HAB species. These project activities will culminate in a Technical Compilation publication and an End-of-Project meeting. It is envisaged that by the end of the project, Member Countries would have achieved the project's objectives of upgrading their laboratory capabilities and credibility testing for ASP, AZA and BTX biotoxins, establishing biotoxins monitoring programmes for routine surveillance testing of fish and fisheries products, improving their knowledge and understanding on the levels of biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region as well as of toxic HAB occurrences and incidences in the region, and enhancing their capabilities for the identification of toxic HAB species to ensure that fisheries products are safe for consumption. The expected outputs of this project are: a regional training course in AZA, ASP and BTX biotoxins analyses, a regional training course in identification of toxic HAB species, biotoxins monitoring surveys in Member Countries, and a Technical Compilation publication of the project.

2. Background and Justification

Marine biotoxins represent a significant and expanding threat to human health in many parts of the world. The impact is visible in terms of human poisoning or even death following the consumption of contaminated shellfish or fish, as well as mass killings of fish and shellfish, and the death of marine animals and birds.

The Codex Alimentarius Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) defined biotoxins as poisonous substances naturally present in fish and fishery products or accumulated by the animals feeding on toxin producing algae, or in the water containing toxins produced by such organisms.

Monitoring seafood for toxicity is essential to manage the risks. However, there are several limitations in monitoring for toxicity such as the variation in toxin content between individual shellfish, different detection and even extraction methods for the various toxins, requiring a decision which toxins one is testing for, and the frequency of sampling to ensure that toxicity does not rise to dangerous levels in temporal or spatial gap between sampling times or locations. Furthermore, the growing harvest of non-traditional shellfish (such as moon snails, whelks, barnacles, etc) may increase human health problems and management responsibilities.

MFRD has conducted a project on biotoxins monitoring in ASEAN from 2009 to 2012 to increase the attention in expanding and improving initiatives to monitor, detect and share information on marine biotoxins in order to reduce the public health risks associated with the consumption of contaminated shellfish and fish. The project had covered training in analytical methods for Diarrhoeic Shellfish Poisoning (DSP) toxins, lipophilic toxins, Paralytic Shellfish Poisoning (PSP) toxins and Tetrodotoxin (TTX) and a monitoring survey on PSP toxin in ASEAN Member Countries.

This project is an extension of the previous project to address the needs of Member Countries and continue with capability building in biotoxins analyses and monitoring, with the proposed focus on other biotoxins like Amnesic Shellfish Poisoning (ASP) toxin (Domoic Acid) and Azaspiracids (AZA). These 2 biotoxins were raised as part of the training needs by Member Countries during the RTC of the previous project in 2009. Brevetoxins (BTX) which causes Neurotoxic Shellfish Poisoning (NSP) is also recommended to be included in the new project as ASP, AZA and BTX, along with DSP and PSP, should be regulated according to CODEX for shellfish.

During the End-of-Project Seminar for the biotoxins monitoring project in 2012, Member Countries also pointed the importance of identifying toxic HAB species to complement existing biotoxins monitoring programmes to ensure that fish and shellfish are not contaminated with toxic algae or their toxins. Member Countries suggested that MFRD consider conducting a project on toxic HABs to enhance regional capabilities for the identification of toxic HAB species. MFRD has taken up this suggestion by including a separate component on toxic HAB species identification within this project.

The key stakeholders/beneficiaries of this project are the relevant agencies in the fisheries department of the ASEAN-SEAFDEC Member Countries which are responsible for ensuring the safety of fish and shellfish for consumption and for monitoring and testing of fish and shellfish; the aquaculture farmers and harvesters of the fish and shellfish; as well as the consumers/buyers, international and domestic.

This project is in line with the following Resolution and Plan of Action as endorsed at the ASEAN-SEAFDEC Conference of 2011:

Resolution 21: Improve technologies and facilities to ensure fish quality assurance and safety management systems, taking into account the importance of traditional fishery products and food security requirements, and promote the development of fishery products as an alternative supplementary livelihood for fisheries communities.

Plan of Action D61: Strengthen fish quality and safety management systems that support the competitive position of ASEAN fish products on world markets, including moving towards ISO/IEC 17025 accreditation of national fish inspection laboratories, strengthening capacity and acknowledging the recognized national laboratories, risk analysis and equivalence agreement such as the Mutual Recognition Agreement (MRA) and promote the implementation of the quality and safety management systems among small and medium enterprises in the ASEAN region.

Plan of Action D63: Promote and conduct training programs and develop training materials to upgrade the technical skills and competencies of personnel in the public and private sectors on fisheries post-harvest technology and food safety management system.

This project is also in line with the SEAFDEC Program Thrust II on Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade.

Proposed Project Extension 2018-2019

In 2016, Member Countries highlighted challenges faced in implementing the biotoxin monitoring surveys due to manpower and technical constraints. As a result, implementation of the survey in a few countries were delayed by a number of months such that the survey duration of one and half years could not be achieved by the end of 2016. As such, Member Countries requested to extend the biotoxin monitoring survey till the end of 2017 to enable them to complete their survey plans so that more results and data can be gathered for a better understanding of HAB occurrences.

During the Regional Training Course on Identification of HAB Species in the ASEAN Region in 2016, Member Countries highlighted the need for more training on specimen preservation and culturing techniques for identification and monitoring of HAB species. As such, Member Countries requested that MFRD organize additional training courses on these topics to enhance the region's capabilities in managing toxic HAB incidences.

In view of all of the above, MFRD proposes to extend the project for another two years *i.e.* 2018-2019, to enable Member Countries' requests for extension of the biotoxin monitoring survey period and additional regional training courses on HAB to be incorporated as additional activities in 2017-2018 while the project's final year's activities *i.e.* publication of a Technical Compilation and an End-of –Project Seminar will now be conducted in 2019.

3. Gender Sensitivity of the Project

The project activities were generally gender-neutral in nature; The gender of participants of the training are not restricted for any of the trainings or meetings and it is often distributed evenly as reflected in the attendance for the latest meeting in Part II section 2.

4. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

4.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To upgrade regional laboratory capabilities and credibility for testing of ASP, AZA and BTX biotoxins	Outcome 1: Enhanced laboratory capabilities and knowledge in the testing of ASP, AZA and BTX biotoxins	Regional training course in biotoxins (AZA, ASP and BTX) analyses	Organization and conduct of Regional Training Course in Biotoxins (AZA, ASP and BTX) Analyses, 2-6 June 2014, Singapore
Objective 2: To establish monitoring programmes for ASP, AZA and BTX biotoxins in Member Countries for routine surveillance	Outcome 2: Establishment of monitoring programmes for ASP, AZA and BTX biotoxins in Member Countries for routine surveillance	Biotoxin monitoring surveys in Member Countries	Organization and conduct of one and half-year Biotoxins Monitoring Survey in 2015-2016. Extended to end of 2017.

Objective	Outcomes	Outputs	Activities
Objective 3: To improve knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in the ASEAN region and facilitate information exchange among Member Countries	Outcome 3: Improved knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in the ASEAN region	Regional Technical Consultation	Organization and conduct of Regional Technical Consultation, 24-25 July 2013, Singapore
		Biotoxin monitoring surveys in Member Countries	Organization and conduct of one and half-year Biotoxins Monitoring Survey in 2015-2016. Extended to end of 2017.
		End-of-Project (EOP) Meeting	Organization and conduct of End-of-Project (EOP) Meeting. 14-15 Aug 2019
		Technical Compilation	Preparation and publication of Technical Compilation in 2019
Objective 4: To improve knowledge and understanding on toxic HAB occurrences and incidences in the ASEAN region	Outcome 4: Improved knowledge and understanding on toxic HAB occurrences and incidences in the ASEAN region	Regional Technical Consultation	Organization and conduct of Regional Technical Consultation in 3 rd qtr 2015
		End-of-Project (EOP) Meeting	Organization and conduct of End-of-Project (EOP) Meeting in 3 rd qtr 2019
		Technical Compilation	Preparation and publication of Technical Compilation in 2018/2019
Objective 5: To enhance regional capabilities for identification of toxic HAB species in Member Countries	Outcome 5: Enhanced capabilities for the identification of toxic HAB species in Member Countries	Regional Training Course on Identification of HAB Species in the ASEAN Region	Organization and conduct of Regional Training Course on Identification of HAB species in the ASEAN Region in 2 nd qtr 2016 (in collaboration with IOC-WESTPAC)
		Regional Training Course on Specimen Preservation and its Application in HAB Monitoring and Studies	Organization and conduct of Regional Training Course on Specimen Preservation and its Application in HAB Monitoring and Studies in 2 nd qtr 2017.
		Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization	Organization and conduct of Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization in 2 nd qtr 2018.

4.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Regional Technical Consultation on Biotoxins (ASP, AZA and BTX) Monitoring in the ASEAN region (2 days)	This Regional Technical Consultation will be held in the first year of the project in the 2 nd quarter of 2013. It will discuss and plan for all project activities, identify the training needs in the individual Member Countries, determine the content of the training course, identify the venue and expert trainers for the training course, identify the key project leaders and the targeted biotoxins for the surveys in Member Countries.

Activity	Description
Activity 2: Regional Training Course in Biotoxins (ASP, AZA and BTX) Analyses (5 days)	The second year (2014) will involve a Regional Training Course with hands-on practical sessions on biotoxins analyses. The proposed biotoxins for training include Amnesic Shellfish Poisoning (ASP) toxin, Azaspiracids (AZA) and Brevetoxin (BTX). The training course is to be conducted by invited expert trainers. Two participants from each member country will be invited. It is envisaged that after the training course, Member Countries would be in a better position to upgrade their laboratory capabilities and credibility in the testing of ASP, AZA and BTX biotoxins in fish and fish products and to assist them in establishing biotoxins monitoring programmes in their own country.
Activity 3: Biotoxins Monitoring Survey (One and half-years) (Extended till end 2017)	After the training course, Member Countries are then encouraged to set up the methods learnt in the training course and use the methods for the survey. The survey will involve monitoring the biotoxins levels at identified site(s) over a period of one and half years at regular intervals during the third and fourth year (2015 and 2016) of the project. Biotoxins that were already covered in the training course in 2010 (for example Diarrhetic Shellfish Poisoning, DSP and lipophilic toxins, TTX) can also be included in the survey if Member Countries are interested. The survey aims to improve Member Countries' understanding on the level of ASP, AZA and BTX biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region. Due to the extension of the project till the end of 2019 and Member Countries' request, the survey period will be extended till the end of 2017.
Activity 4: Regional Technical Consultation on Biotoxin-producing HAB species Identification (2 days)	A Regional Technical Consultation meeting (RTC) will be held in Singapore in 3 rd quarter 2015 to initiate this component of the project and plan for all activities. All ASEAN-SEAFDEC Member Countries will be invited to the meeting and to participate in the activities. ASEAN-SEAFDEC Member Countries will present country reports on toxic HAB occurrences and incidences as well as the management of toxic HABs in their waters. A Key Project Leader (KPL) for each country will be appointed to be responsible for the project's activities in his or her country. The meeting will finalize the details of the training course to be conducted in 2016 and identify the necessary expert trainers and training needs in the region. The meeting will also initiate the process to establish a network or directory of responsible national authorities or HAB experts in the region.
Activity 5: Regional Training Course on Identification of HAB Species in the ASEAN Region (5 days)	This Regional Training Course will be conducted in Singapore in 2 nd quarter 2016, in collaboration with IOC-WESTPAC. The training course will be conducted by invited expert trainers and it is envisaged that the methods for identifying toxic HAB species will be taught during the course. Two participants from each Member Country will be invited to attend this course. After the training course, Member Countries are recommended to apply what they have learnt to set up the appropriate methodologies in their own laboratories for identifying toxic HAB species.

Activity	Description
Activity 6: Regional Training course on Specimen Preservation and its Application in HAB Monitoring and Studies (5days)	This Regional Training Course will be conducted in the 2 nd quarter of 2017 in collaboration with the Institute of Ocean & Earth Science (IOES), University of Malaya (UM) at its Bachok Marine Research Station (BMRS) in Kelantan. The training course will include topics on specimen preservation methods and techniques, use of fluorescence and electron microscopy and flowcytometry. Two participants from each Member Country will be invited to attend this course. After the training course, Member Countries are recommended to apply what they have learnt to set up the appropriate methodologies in their own laboratories for monitoring of toxic HAB species.
Activity7: Regional Training course on Culturing for HAB Species Identification and Toxin Characterization (7 days)	This Regional Training Course will be conducted in the 2 nd quarter of 2018, in collaboration with the Institute of Ocean & Earth Science (IOES), University of Malaya (UM) at its Bachok Marine Research Station (BMRS) in Kelantan. The training course will include topics on isolation, culturing and cell harvesting methods and techniques for morphology, molecular and toxin analysis of HAB species. Two participants from each member country will be invited to attend this course. After the training course, Member Countries are recommended to apply what they have learnt to set up the appropriate methodologies in their own laboratories for identifying toxic HAB species.
Activity 8: Technical Compilation (10-12 months)	The Technical Compilation of the project will be prepared from 1st quarter of 2018 after biotoxin monitoring surveys in Member Countries have been completed and, results and reports submitted. It will be published in the project's final year in 2019. The Technical Compilation will comprise of the compilation of the biotoxins analytical methods and biotoxins monitoring survey reports of the Member Countries, the methodologies for the isolation, culturing, preservation, identification and monitoring of toxic HAB species from the three regional training courses, country reports on toxic HAB occurrences and incidences as well as the management of toxic HABs in Member Countries and, the list/directory of responsible national authorities and HAB experts in Member Countries.
Activity 9: End-of-Project (EOP) Meeting (2 days)	The End-of-Project (EOP) Meeting will be held in the 3 rd quarter of 2019. The EOP will present and discuss the reports and results of the biotoxins monitoring surveys conducted by Member Countries, country reports on HABs, discuss the challenges faced during the project implementation and plans for future projects or activities nationally and regionally, and finalize the Technical Compilation for publication.

4.3 Activity, Sub-activity and Proposed Budget for 2013-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1: Regional Technical Consultation on Biotoxins (ASP, AZA and BTX) Monitoring in the ASEAN region	-	35,500	-	-	-	-	-	-

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 2: Regional Training Course in Biotoxins (ASP, AZA and BTX) Analyses	-	-	28,700	-	-	-	-	-
Activity 3: Biotoxins Monitoring Survey (to be extended till end 2017)	Sub-activity 3.1: Setting up of Biotoxins Analyses Methodologies	-	-	10,000	-	-	-	-
	Sub-activity 3.2: Implementation of Biotoxins Monitoring Survey	-	-	7,500	5,000	9,000	-	-
Activity 4: Regional Technical Consultation on Toxic HAB species Identification	-	-	-	31,700	-	-	-	-
Activity 5: Regional Training Course on Identification of HAB Species in the ASEAN Region	-	-	-	-	31,344	-	-	-
Activity 6: Regional Training Course on Specimen Preservation and its Application in HAB Monitoring and Studies	-	-	-	-	-	31,748	-	-
Activity 7: Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization	-	-	-	-	-	-	42,572	-
Activity 8: Technical Compilation	-	-	-	-	-	-	2,000	3,000
Activity 9: End-of-Project (EOP) Meeting	-	-	-	-	-	-	-	36,850
	Sub-Total	35,500	28,700	49,200	36,344	40,748	44,572	39,850

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Technical Compilation

A total of 7 Member Countries, namely Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam participated in the JTFVI Biotoxins Monitoring in the ASEAN region. However, it was noted that only Indonesia, Malaysia and Singapore managed to test for all 3 biotoxins (ASP, AZA and BTX).

The Technical Compilation contains the survey results from the participating countries, administrative reports and participants list for all the meetings and trainings, the methodology for the testing methods shared during training, and information on Key Project Leader and National Reference Laboratory for both biotoxins monitoring and Harmful Algal Bloom monitoring.

End-of-Project (EOP) meeting

The EOP meeting was held on 14-15 Aug 2019. A total of 25 participants from 10 ASEAN Member Countries attended the EOP. The EOP presented and discussed reports and results of the biotoxins monitoring surveys conducted by Member Countries, discussed the challenges faced during the project implementation, finalized the Technical Compilation for publication.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 8: Technical Compilation	Administrative	-	2 (1) MFRD		3000
Activity 9: End-of-Project (EOP) Meeting	Meeting	25 (14)	6 (5) MFRD	3	26,293.04

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 8: Technical Compilation	Preparation and publication of Technical Compilation in 2019	Technical compilation finalized during the EOP meeting in 14-15 Aug 2019. To be published by end of 2019 for distribution.
Activity 9: End-of-Project (EOP) Meeting	Organization and conduct of End-of-Project (EOP) Meeting. 14-15 Aug 2019	A total of 25 participants from 10 ASEAN Member Countries, 6 MFRD representatives and 3 experts attended the EOP meeting held on 14-15 Aug 2019. This project has successfully helped to enhance regional capabilities for the testing of ASP, AZA and BTX biotoxins as well as the identification of toxic HAB species. Member Countries have a greater understanding and knowledge on the occurrences and incidences of biotoxins (<i>i.e.</i> fish and shellfish) and HAB species in the ASEAN region.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
1. Technical Compilation of Biotoxins Monitoring in the ASEAN Region	Hardcopy	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 9: End-of-Project (EOP) Meeting	The participants from the SEAFDEC Member Countries expressed their heartfelt appreciation to MFRD for the warm hospitality accorded to them and the excellent arrangements made for the meeting and to the Government of Japan for making the meeting possible.

6. Major Impacts/Issues:

Nil for Activity 8: Technical compilation and Activity 9: EOP Meeting

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

A total of 3 meetings (2 Technical Consultation and 1 EOP), 4 training courses (1 on biotoxin monitoring and 3 on HABs) and 1 technical compilation publication were developed. Over 100 participants from 10 ASEAN Member Countries have benefitted from one or more of the activities mentioned.

In conclusion, this project has successfully helped to enhance regional capabilities for the testing of ASP, AZA and BTX biotoxins as well as the identification of toxic HAB species. Member Countries have a greater understanding and knowledge on the occurrences and incidences of biotoxins (*i.e.* fish and shellfish) and HAB species in the ASEAN region.

2. Implemented Activities/sub-activities in the Overall Project Duration

Activity	Description
Activity 1: Regional Technical Consultation on Biotoxins (ASP, AZA and BTX) Monitoring in the ASEAN region (2 days)	Organized and conducted Regional Technical Consultation, 24-25 July 2013, Singapore All project activities, training needs in the individual Member Countries, the content, venue and expert trainers of the training course, the key project leaders and the targeted biotoxins for the surveys in Member Countries were discussed and identified.
Activity 2: Regional Training Course in Biotoxins (ASP, AZA and BTX) Analyses (5 days)	Organized and conducted Regional Training Course in Biotoxins (AZA, ASP and BTX) Analyses, 2-6 June 2014, Singapore The Regional Training Course for AZA, ASP and BTX was conducted by invited experts with hands-on practical sessions on biotoxins analyses.
Activity 3: Biotoxins Monitoring Survey (One and half-years) (Extended till end 2017)	Organized and conducted one and half-year Biotoxins Monitoring Survey in 2015-2016. Extended to end of 2017. After the training course, Member Countries were encouraged to set up the methods learnt in the training course and use the methods for the survey. A total of 7 Member Countries participated in the survey.
Activity 4: Regional Technical Consultation on Biotoxin-producing HAB species Identification (2 days)	Organized and conducted Regional Technical Consultation, 5-6 Aug 2015 ASEAN-SEAFDEC Member Countries presented the country reports on toxic HAB occurrences and incidences as well as the management of toxic HABs in their waters. The details of the training course to be conducted, the necessary expert trainers were identified, and training needs in the region was finalized at the meeting. A Key Project Leader (KPL) for each country was appointed to be responsible for the project's activities in his or her country. The meeting also initiated the process to establish a network or directory of responsible national authorities or HAB experts in the region.

Activity	Description
Activity 5: Regional Training Course on Identification of HAB Species in the ASEAN Region (5 days)	Organized and conducted Regional Training Course on Identification of HAB Species in the ASEAN Region, 18 – 22 Jul 2016. This Regional Training Course was conducted in Singapore in collaboration with IOC-WESTPAC. The training course was conducted by invited expert trainers and the methods for identifying toxic HAB species was taught during the course.
Activity 6: Regional Training course on Specimen Preservation and its Application in HAB Monitoring and Studies (5days)	Organized and conducted Regional Training Course on Specimen Preservation and its Application in HAB Monitoring and Studies, 10 – 13 Jul 2017. This Regional Training Course was conducted in collaboration with the Institute of Ocean & Earth Science (IOES), University of Malaya (UM) at its Bachok Marine Research Station (BMRS) in Kelantan. The training course included topics on specimen preservation methods and techniques, use of fluorescence and electron microscopy and flowcytometry.
Activity7: Regional Training course on Culturing for HAB Species Identification and Toxin Characterization (7 days)	Organized and conducted Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization, 8 – 15 Jul 2018. This Regional Training Course was conducted in collaboration with the Institute of Ocean & Earth Science (IOES), University of Malaya (UM) at its Bachok Marine Research Station (BMRS) in Kelantan. The training course included topics on isolation, culturing and cell harvesting methods and techniques for morphology, molecular and toxin analysis of HAB species.
Activity 8: Technical Compilation (10-12 months)	Preparation and publication of Technical Compilation in 2019 The Technical Compilation of the project was prepared after biotoxin monitoring surveys in Member Countries have been completed and, results and reports submitted. It will be published in the project's final year in 2019. The Technical Compilation will comprise of the compilation of the biotoxins analytical methods and biotoxins monitoring survey reports of the Member Countries, the list/directory of responsible national authorities and HAB experts in Member Countries.
Activity 9: End-of-Project (EOP) Meeting (2 days)	The EOP meeting was held on 14-15 Aug 2019. A total of 25 participants from 10 ASEAN Member Countries attended the EOP. The EOP presented and discussed reports and results of the biotoxins monitoring surveys conducted by Member Countries, discussed the challenges faced during the project implementation, finalized the Technical Compilation for publication.

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1: Regional Technical Consultation on Biotoxins (ASP, AZA and BTX) Monitoring in the ASEAN region (2 days)	Organized and conducted Regional Technical Consultation, 24-25 July 2013, Singapore 21 participants from 10 ASEAN Member Countries, 1 Japanese Expert, and 9 participants from SEAFDEC (1 from Sec and 8 from MFRD) attended the meeting.
Activity 2: Regional Training Course in Biotoxins (ASP, AZA and BTX) Analyses (5 days)	Organized and conducted Regional Training Course in Biotoxins (AZA, ASP and BTX) Analyses, 2-6 June 2014, Singapore 24 participants from 10 ASEAN Member Countries, 2 Experts, and 4 participants from SEAFDEC MFRD attended the training.
Activity 3: Biotoxins Monitoring Survey (One and half-years) (Extended till end 2017)	Organized and conducted one and half-year Biotoxins Monitoring Survey in 2015-2016. Extended to end of 2017. A total of 7 Member Countries participated in the survey.
Activity 4: Regional Technical Consultation on Biotoxin-producing HAB species Identification (2 days)	Organized and conducted Regional Technical Consultation, 5-6 Aug 2015 23 participants from 10 ASEAN Member Countries, 3 Japanese Experts, and 9 participants from SEAFDEC MFRD attended the meeting.
Activity 5: Regional Training Course on Identification of HAB Species in the ASEAN Region (5 days)	Organized and conducted Regional Training Course on Identification of HAB Species in the ASEAN Region, 18 – 22 Jul 2016. 21 participants from 10 ASEAN Member Countries, 6 Experts, and 4 participants from SEAFDEC MFRD attended the training.
Activity 6: Regional Training course on Specimen Preservation and its Application in HAB Monitoring and Studies (5days)	Organized and conducted Regional Training Course on Specimen Preservation and its Application in HAB Monitoring and Studies, 10 – 13 Jul 2017. 20 participants from 10 ASEAN Member Countries, 4 Experts, and 2 participants from SEAFDEC MFRD attended the training.
Activity 7: Regional Training course on Culturing for HAB Species Identification and Toxin Characterization (7 days)	Organized and conducted Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization, 8 – 15 Jul 2018. 20 participants from 10 ASEAN Member Countries, 4 Experts, and 2 participants from SEAFDEC MFRD attended the training.
Activity 8: Technical Compilation (10-12 months)	Preparation and publication of Technical Compilation in 2019 The Technical Compilation of the project was finalized at the EOP meeting. It will be published in the project's final year in 2019.
Activity 9: End-of-Project (EOP) Meeting (2 days)	The EOP meeting was held on 14-15 Aug 2019. A total of 25 participants from 10 ASEAN Member Countries, 3 Experts, 6 attended the EOP meeting.

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Limited funding for sampling and analysis and insufficient laboratory resources were the most common issues faced by the Member Countries during the survey. The resulted in some delay in the survey which were resolved through the extension of the survey monitoring phase for the project.

5. Publications and Others

Publication	Year/issue	Title of publication
SEAFDEC Newsletter	Vol. 36 No.3 (Jul-Sep 2013)	Regional Technical Consultation (RTC) Meeting of the Japanese Trust Fund VI Project on Chemical & Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins Monitoring in ASEAN Region: ASP, AZA and BTX
Annual Highlights	2013	Japanese Trust Fund VI: Chemical and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins Monitoring in Fish and Fish Products in ASEAN Region: ASP, AZA and BTX
SEAFDEC Newsletter	Vol.37 No.2 (Apr-Jun 2014)	Regional Training Course in Biotoxins Analysis: ASP, AZA and BTX
Annual Highlights	2014	Japanese Trust Fund VI: Chemical and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins Monitoring in Fish and Fish Products in ASEAN Region: ASP, AZA and BTX
SEAFDEC Newsletter	Vol.38 No.3 (Jul-Sep 2015)	Regional Technical Consultation on Harmful Algal Blooms in the ASEAN Region
Annual Highlights	2015	Japanese Trust Fund VI: Chemical and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins Monitoring (ASP, AZA and BTX) and HABs in the ASEAN Region
SEAFDEC Newsletter	Vol.39 No.3 (Jul- Sep 2016)	Regional Training Course on Identification of HAB Species in the ASEAN Region
Annual Highlights	2016	Japanese Trust Fund VI: Chemical and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins (ASP, AZA and BTX) and HABs in the ASEAN Region
Fish for the People	Vol.15 No.1:2017	Monitoring and Identification of Harmful Algal Blooms in Southeast Asia to support SDG 14.1
SEAFDEC Newsletter	Vol.40 No.3 (Jul-Sep 2017)	Regional Training Course on Specimen Preservation and its Application in Harmful Algal Bloom (HAB) Monitoring Studies
Annual Highlights	2017	Japanese Trust Fund VI: Chemical and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins (ASP, AZA and BTX) and HABs in the ASEAN Region
SEAFDEC Newsletter	Vol.4 No.3 (Jul-Sep 2018)	Regional Training Course on Culturing of HAB Species and Toxin Characterization
Annual Highlights	2018	Japanese Trust Fund VI: Chemical and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins (ASP, AZA and BTX) and HABs in the ASEAN Region

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2019**

Project id: 201404001			
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trade of Fish and Fishery Products		
Program Strategy No. :	IV	Total Duration:	2013 - 2019
Lead Department:	Marine Fishery Resources Development and Management Department (MFRDMD)	Lead Country:	Singapore
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 181,442
Project Partner:	None	Budget for 2019:	USD 0
Project Leader:	Abdul Razak Bin Latun / MFRDMD	Project Participating Country(ies) :	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

MFRDMD is the responsible SEAFDEC Department for this project to manage and coordinate all project activities. All SEAFDEC Member Countries are involved in the activities. The objectives of the project are 1) To provide suggestions for Member Countries to strengthen cooperation in combating IUU fishing. 2) To study existing fishing and trading practices in small-scale fishery in the region. 3) To analyse associated problems in compliance with the EC Regulation No. 1005/2008 in the region and 4) To suggest a possible catch certification system for large- and small-scale fisheries to ensure only non-IUU/legal fish and fishery products traded in the region.

The project involves identification of existing practices/mechanisms in small-scale fishery and of associated problems in compliance with the EC Regulation No.1005/2008 for large-scale fishery in the region through core expert meetings. The information gathered will be analysed and discussion among countries will provide a guidelines to prevent entry of fish and fishery products from IUU fishing activities into markets in the Southeast Asian region and a possible catch certification system for combating IUU fishing in the Southeast Asian region with possible expansion and/or modification of the regulation for international trade in fish and fishery products within the region.

The outputs of the project will provide basis for developing a catch certification system to ensure only non-IUU/legal fish and fishery products were traded in the region. The cooperation amongst the Member Countries will be strengthened so as to facilitate trade within the region and directly or indirectly combating IUU fishing in the large- and small-scale fisheries of AMSs.

2. Background and Justification

Most countries in the Southeast Asian region have developed their respective regulations based on EC Regulation 1005/2008. Therefore, it is possible for the countries to support the efforts to use trade measures to combat IUU fishing within the region. Countries should ensure the primary responsibility of flag state and counter measures to combat IUU fishing.

The project involves identification of existing trade practices/mechanisms in small-scale fishery and of associated problems in compliance with the EC Regulation No.1005/2008 for large-scale capture fishery in the region through core expert meetings.

The information gathered were analysed and comparison among countries will provide a possible catch documentation system for combating IUU fishing in the Southeast Asian region with possible expansion and/or modification for the regulation of international trade in fish and fishery products within the region.

This project corresponds to Resolution #8 of the ASEAN-SEAFDEC conference in 2011: Foster cooperation among ASEAN Member States, international and regional organizations in combating IUU fishing. This project corresponds to the Plan of Action #67 of the conference: Strengthen cooperation among Member Countries to implement international standards with regards to trading on fish and fishery products within the ASEAN region. SEAFDEC/MFRDMD published the “ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain” in 2015 in cooperation with MCs, SEAFDEC/TD and SEAFDEC/SEC. Member Countries required MFRDMD to assist them implementing the Guidelines.

3. Gender Sensitivity of the Project

The project is not Gender Sensitive. This is true as implementation of the project from the start did not emphasize on which gender should be involved in project meetings and consultation. We had invited experts in the field.

4. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

4.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To provide suggestions for Member Countries to strengthen cooperation in combating IUU fishing	Outcome 1: Strengthen cooperation among Member Countries in combating IUU fishing	Output 1: The ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain	Activity 1 Meetings for Effective Program Implementation Core Expert Meeting Terminal Core Expert Meeting
Objective 2: To study existing fishing and trading practices in small-scale fishery in the region to combat IUU fishing.	Outcome 2: Understanding of existing fishing and trading practices in small-scale fishery to combat IUU fishing	Output 2: Identification of existing practices in small-scale fishery to combat IUU fishing	Activity 2 To study existing fishing and trading practices in small-scale fishery & problems in compliance with the EC Regulation 1005/2008 in large-scale fishery 2.1 Identification of existing practices/ mechanisms and associated problems 2.2 Consideration of possible solutions to the problems
Objective 3: To assist the establishment of a possible catch documentation scheme for capture fisheries to ensure only non-IUU/legal fish and fishery products are traded in the region	Outcome 3: Non-IUU/legal fish and fishery products are traded by using ASEAN catch documentation scheme	Output 3: Establishment and dissemination of ASEAN catch documentation scheme	Activity 3 Establishment and dissemination of a possible catch documentation scheme in the region

4.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Meetings for Effective Program Implementation	Core Expert Meetings (CEM), Regional Technical Consultations (RTC) and Terminal project meeting were held for effective program implementation. The meetings were held in 2013, 2014, 2016, 2017 and 2019 to formulate, finalized, disseminate and promote the ASEAN Guidelines to Prevent Entry of IUU Fish and Fishery Products From IUU Fishing Activities into the Supply Chain. The RTC for establishment of an ASEAN Catch Documentation Scheme (ACDS) was conducted in 2014. The terminal meeting of the JTF VI - IUU project was organised from 3 – 5 September 2019.
Activity 2 To study existing fishing and trading practices in small-scale fishery & problems in compliance with the EC Regulation 1005/2008 in large-scale fishery	MFRDMD studied existing fishing and trading practices in small-scale fishery & problems in compliance with the EC Regulation 1005/2008 in large-scale fishery to help formulate the “ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain”. MFRDMD will work with AMSs to promote and disseminate “ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain” under the ASEAN framework. MFRDMD will assist SEAFDEC Member States to implement the ASEAN Guidelines.
Activity 3 Establishment and dissemination of a possible catch documentation scheme in the region	MFRDMD will collaborate with the SEAFDEC/Sec to facilitate establishment and dissemination of a possible catch documentation scheme that is applicable in the ASEAN Member States

4.3 Activity, Sub-activity and Proposed Budget for 2014-2019

(Unit: USD)

Activity	Sub-Activity	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1: Meetings for Effective Program Implementation	Sub-activity 1.1 Core Expert Meetings		32,604		24,000		
	Sub-activity 1.2 Terminal Core Expert Meeting						24,399
Activity 2: To study existing fishing and trading practices in small-scale fishery & problems in compliance with the EC Regulation 1005/2008 in large-scale fishery	Sub-activity 2.1: Identification of existing practices/mechanisms and associated problems	8,000					
	Sub-activity 2.2: Consideration of possible solutions to the problems	10,000	196	4,884		21,100	
Activity 3: Establishment and dissemination of a possible catch documentation scheme in the region	Sub-activity 3.1: Establishment and dissemination of a catch documentation scheme for ASEAN countries		200	8,000	3,331	8,796	2,331
Sub-Total Budget		18,000	33,000	12,884	27,331	29,896	26,730

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

MFRDMD conducted the Terminal Core Expert Meeting from 3 – 5 September 2019 at Melia Kuala Lumpur Hotel, Malaysia. Estimated budget for the Terminal Core Expert Meeting is USD24,339.00. The meeting was attended by representatives from all ASEAN member states, DSG, resource person from Global Fishing Watch and officials from SEAFDEC/TD, SEAFDEC/MFRDMD. MFRDMD compiled and summarized the feedback from all 10 AMSs on issues and self – evaluation on status of the implementation of the ASEAN Guidelines in AMSs. MFRDMD hope that all AMSs will continue to monitor the status of implementation of the ASEAN Guidelines in their country annually using the self-evaluation method.

MFRDMD will continue to collaborate with the SEAFDEC/TD to facilitate establishment and dissemination of a possible catch documentation scheme or eACDS that is applicable in the ASEAN Member States.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1					
Sub-activity 1.2	Terminal meeting	11 (3)	6 (1)	1	24,399
Activity 3					
Sub-activity 3.1	Establish -ment and dissemination of a catch documentation scheme for ASEAN countries		2 (1)		2331

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.2	Strengthen cooperation among Member Countries in combating IUU fishing	The terminal meeting of the JTF VI - IUU project was organized from 3 – 5 September 2019. The meeting was attended by representatives from all AMSs, the Deputy Secretary General of SEAFDEC, resource person from Global Fishing Watch, Jakarta and the Chief and Deputy Chief of SEAFDEC / MFRDMD and officers from TD and MFRDMD. A self-evaluation of the implementation of the ASEAN Guidelines was conducted during the terminal meeting.
Activity 3		
Sub-activity 3.1	Establishment and dissemination of ASEAN catch documentation scheme in member states	MFRDMD invited persons from SEAFDEC/Sec and TD in the terminal meeting and progress of implementation of the e-ACDS in Brunei Darussalam was reported.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
Abdul Razak Latun and Mazalina Ali (2019). Interim Report for the Implementation of The ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into The Supply Chain: Self-evaluation by ASEAN Member States	Print	
The Terminal Meeting Report of the JTF VI Project on Combating IUU Fishing in Southeast Asia through Application of Catch Certification for International Trade in Fish and Fishery Products 3-5 September 2019, Melia Kuala Lumpur Hotel, Malaysia (2019)	In press	
Final Report : JTF6 – IUU Project on Combating IUU Fishing in Southeast Asia through Application of Catch Certification for International Trade in Fish and Fishery Products	In press	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1	-
Sub-activity 1.2	The participants learned the current status of implementation of the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain in AMSs.
Activity 3	-
Sub-activity 3.1	The relevant stakeholders in Brunei Darussalam have learnt the usage of eACDS during the onsite training program.

6. Major Impacts/Issues

Effective coordination of several related programs in relation with combating IUU Fisheries in the ASEAN region should be considered.

The cooperation of each AMSs is very important to make the implementation and consultation of ASEAN Guidelines succeed.

In future all AMSs are requested to send the feedback of questionnaires and respond to the letters sent to their country within the stipulated timeframe.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

MFRDMD compiled and summarized the feedback from 8 AMSs on current status, issues and possible actions in the implementation of the ASEAN Guidelines in AMSs based on information gathered during consultative visits to Malaysia, Indonesia, Philippines, Cambodia, Myanmar, Lao PDR, Thailand and Viet Nam. An interim report of the feedback and self-evaluation conducted on the implementation of the ASEAN Guidelines by visited AMSs was published in 2019.

The status of implementation of the ASEAN Guideline in all 10 AMS was discussed at the 2019 Terminal JTF 6 – IUU project meeting, most AMS have implemented more than 80% of the articles in the ASEAN Guidelines which indicated that all AMS were committed to combat IUU fishing in the region.

The introduction of eACDS (ASEAN Catch Documentation Scheme) was launched during the Meeting of SEAFDEC Council in Brunei Darussalam in April 2017. In 2017, MFRDMD in collaboration with SEAFDEC/Secretariat had conducted four (4) onsite training program on the use of eACDS by all relevant stakeholders in Brunei Darussalam.

MFRDMD in collaboration with SEAFDEC/TD will continuously conduct development and training on the usage of eACDS and meeting with the relevant stakeholders and government servants for establishment and implementation of eACDS in selected AMSs.

Way forward for the project on combating IUU Fishing from 2020 - 2024 will be undertaken by SEAFDEC / TD. The project then will focus on RFVR for fishing vessels in Southeast Asia, capacity building on port inspection to support PSM, sharing information on detection of IUU fishing vessels, development of eACDS in Viet Nam, Malaysia and Myanmar, sharing information on catch documentation and traceability and coordination with international organization and RFMOs. MFRDMD will collaborate with SEAFDEC / TD on the development of eACDS in Brunei DS, Viet Nam, Malaysia and Myanmar.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1	Meetings for Effective Program Implementation
Sub-activity 1.1 <i>Meetings for Effective Program Implementation</i>	<p>The Meeting with Malaysian officials further developed the regional guidelines from 10 to 11 February 2014 at Empress Hotel, Sepang, Malaysia</p> <p>IUU project discussion between officials from SEAFDEC Secretariat and MFRDMD, 28-30 April 2014 at SEAFDEC/MFRDMD, Terengganu, Malaysia.</p> <p>The Meeting with Singapore as the Lead country finalized the regional guidelines on 25 August 2014 at Furama Hotel, Kuala Lumpur, Malaysia.</p> <p>MFRDMD collaborated with SEAFDEC/Sec to organize the Small Group Expert Meeting on CDS from 14 – 16 October 2014 at Concorde KLIA.</p> <p>SEAFDEC/Secretariat and MFRDMD organized the Regional Technical Consultation (RTC) on the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain, 23 to 25 September 2014 at Horizon Hotel, Kota Kinabalu, Sabah, Malaysia. The regional guidelines were finalized at the meeting.</p> <p>MFRDMD collaborated with SEAFDEC/Sec to organize the Regional Technical Consultation on ASEAN Catch Documentation System from 16-18 Dec 2014 at HIG Hotel, Langkawi, Malaysia.</p> <p>The 2nd Regional Expert Consultation on ASEAN Catch Documentation Scheme was organized by SEAFDEC Secretariat and MFRDMD from 25-27 May 2015, HIG Hotel, Langkawi, Malaysia.</p> <p>Meeting with Malaysian Officials On Promotion Of “ASEAN Guidelines For Preventing The Entry Of Fish And Fishery Products From IUU Fishing Activities Into The Supply Chain,” 11-13 August 2015, Dynasty Hotel, Kuala Lumpur, Malaysia.</p> <p>RTC On Promotion Of the “ASEAN Guidelines For Preventing The Entry Of Fish And Fishery Products From IUU Fishing Activities Into The Supply Chain,” scheduled from 2-4 November 2015, HIG Hotel, Langkawi, Malaysia.</p> <p>“Regional Technical Consultation on Promotion of ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain” was held from 7-9 March</p>

List of Activities	Description of Implemented Activities
	<p>2016 in Kuala Lumpur, Malaysia.</p> <p>The 2nd Regional Technical Consultation (RTC) on Promotion of the "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" was conducted by SEAFDEC/MFRDMD from 21-23 November 2017 at AnCasa Hotel and Spa, Kuala Lumpur, Malaysia.</p>
Sub-activity 1.2	<p>The Terminal Meeting of the JTF6 Project: Combating IUU Fishing in Southeast Asia through Application of Catch Certification for International Trade in Fish and Fishery Products 3-5 September 2019, Melia Kuala Lumpur Hotel, Malaysia. The meeting was attended by representatives from all AMSs, the Deputy Secretary-General of SEAFDEC, the Chief and Deputy Chief of MFRDMD, officers from SEAFDEC/TD and SEAFDEC/MFRDMD. Self-evaluation on implementation of the ASEAN Guideline were conducted during the terminal meeting.</p>
Activity 2	<p>To study existing fishing and trading practices in small-scale fishery & problems in compliance with the EC Regulation 1005/2008 in large-scale fishery</p>
Sub-activity 2.1	<p>Existing practices in small-scale fishery and problems associate with the EC Regulation 1005/2008 in the Southeast Asian region were identified through feedbacks by AMSs from questionnaires and during meetings from 2011 till 2014 and have been compiled by SEAFDEC/MFRDMD. Those results were translated into development and finalization of the ASEAN Guidelines in 2014.</p>
Sub-activity 2.2	<p>MFRDMD and SEAFDEC Secretait assisted SEAFDEC Member Countries for endorsement of the ASEAN Regional Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Activities into the Supply Chain under the ASEAN framework.</p> <p>The final draft of the Guidelines was endorsed at the 17th FCG-ASSP Meeting in December 2014.</p> <p>The 47th Meeting of the SEAFDEC Council held from 31 March to 3 April 2015 in Le Meridien Chiang Rai Resort, Chiang Rai, Thailand approved in principle the final draft of the “ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain.”</p> <p>The 23rd Meeting of the ASEAN Sectoral Working Group on Fisheries (ASWGF;10-12 June 2015, Nay Pyi Taw, Myanmar) endorsed the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities Into the Supply Chain. Endorsement of the ASEAN Guidelines by the 36th SSOM- AMAF Meeting in August 2015 and final endorsement by the 37th AMAF Meeting in September 2015.</p> <p>In 2015-16, MFRDMD visited Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar and Thailand for information gathering activity on status of implementation of the “ASEAN guidelines for preventing the entry of fish and fishery products from IUU fishing activities into the supply chain.”</p> <p>In 2018, MFRDMD conducted country visits to 8 AMSs (excluding Brunei Darussalam and Singapore). MFRDMD compiled and summarized feedbacks from 8 AMS on current issues and possible actions in the implementation of the ASEAN Guidelines in Malaysia, Indonesia, the Philippines, Cambodia, Myanmar, Lao PDR, Thailand and Viet Nam. The information and self – evaluations by the visited</p>

List of Activities	Description of Implemented Activities
	AMS were published in an interim report on status of implementation of the ASEAN Guidelines in 2019 and was reported at the 2019 SEAFDEC Council Meeting in Surabaya, Indonesia.
Activity 3	To suggest a possible catch documentation system in the region
Sub-activity 3.1	<p>To suggest a possible catch documentation system for large- and small-scale capture fisheries to ensure only non-IUU/legal fish and fishery products traded in the region.</p> <p>SEAFDEC/Sec and MFRDMD facilitated discussion with AMSs for a catch documentation system in the region. SEAFDEC Member Countries suggested an agreeable catch documentation system, which will increase cooperation among the Member Countries.</p> <p>MFRDMD collaborated with SEAFDEC/Sec to organize the Small Group Expert Meeting on CDS from 14 – 16 October 2014 at Concorde KLIA, Malaysia.</p> <p>MFRDMD collaborated with SEAFDEC/Sec to organize the Regional Technical Consultation on ASEAN Catch Documentation System from 16-18 Dec 2014 at HIG Hotel, Langkawi, Malaysia.</p> <p>The 2nd Regional Expert Consultation on ASEAN Catch Documentation Scheme, 25-27 May 2015, HIG Hotel, Langkawi, Malaysia</p> <p>MFRDMD collaborated with SEAFDEC/Sec to establish and implement a pilot project of the ASEAN Catch Documentation Scheme (eACDS) in Brunei Darussalam. The introduction of the eACDS was launched during the 49th SEAFDEC Council Meeting in Brunei Darussalam in April 2017.</p> <p>MFRDMD then collaborated with SEAFDEC/Sec during the 3rd on-site testing of the eACDS through meetings and discussions with all the relevant stakeholders and government officials in Brunei Darussalam in March 2018. An evaluation of the eACDS implementation in Brunei Darussalam was conducted in 2019 by SEAFDEC/TD.</p>

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1	Meetings for Effective Program Implementation of project
Sub-activity 1.1	Development and finalization of the ASEAN Guidelines through various core expert meetings and regional technical consultations and endorsement of the ASEAN Guidelines through the ASEAN framework for implementation of the ASEAN Guidelines in the Southeast Asian Region / Consultation between representatives of AMS strengthened cooperation among AMS in combating IUU fishing
Sub-activity 1.2	The Terminal Meeting of the JTF6 was conducted from 3-5 September 2019, at Melia Kuala Lumpur Hotel, Malaysia and was attended by representatives from all the ASEAN member states.
Activity 2	To study existing fishing and trading practices in small-scale fishery & problems in compliance with the EC Regulation 1005/2008 in large-scale fishery
Sub-activity 2.1	The ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain was developed through information collections on the trade of fish and fishery products in the region and overcoming problems from compliance to the EC Regulation 1005/2008 / the ASEAN Guidelines is the output from this activity.
Sub-activity 2.2	Consultative country visits and information gathering through feedbacks from questionnaires in AMSs to compiled information on the current status of

List of Activities	Achievements and Outcomes/Outputs of Activities																																																
	<p>implementation of the ASEAN Guidelines on preventing entry of fish and fishery products from IUU fishing activities into the supply chain. Following the promotion for implementation of the ASEAN Guidelines in AMS, self-evaluation on the implementation of the ASEAN Guideline were conducted in 2017, 2018 and 2019.</p> <p>Table 1: Showing the self-evaluation scores in 2017,2018 and 2019 for the status of implementation of the ASEAN Guidelines on preventing entry of fish and fishery products from IUU fishing activities into the supply chain</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Event</th> <th>Br</th> <th>Cam</th> <th>Ind</th> <th>Lao</th> <th>Msia</th> <th>Myr</th> <th>Phi</th> <th>Sin</th> <th>Tha</th> <th>Vie</th> </tr> </thead> <tbody> <tr> <td>2017</td> <td>RTC</td> <td>68.1</td> <td>65.8</td> <td>87.8</td> <td>46.4</td> <td>88.5</td> <td>84.1</td> <td>80.7</td> <td>70.2</td> <td>90.9</td> <td>76.7</td> </tr> <tr> <td>2018</td> <td>Country visits</td> <td></td> <td>84.8</td> <td>96.4</td> <td>60</td> <td>92.4</td> <td>94</td> <td>96.4</td> <td></td> <td>98</td> <td>92.4</td> </tr> <tr> <td>2019</td> <td>Terminal meeting</td> <td>84.8</td> <td>86.4</td> <td>97.6</td> <td>80</td> <td>98.4</td> <td>94.8</td> <td>99.6</td> <td>96</td> <td>98</td> <td>96.4</td> </tr> </tbody> </table> <p>On the overall we can positively see an increasing trend in the status of implementation of the ASEAN Guidelines from 2016 till 2019 in the Southeast Asian Region. AMSs are suggested to consider continuing the self-evaluation on the implementation of the ASEAN Guidelines on their own, to keep track of the activities to combat IUU fishing in their countries.</p>	Year	Event	Br	Cam	Ind	Lao	Msia	Myr	Phi	Sin	Tha	Vie	2017	RTC	68.1	65.8	87.8	46.4	88.5	84.1	80.7	70.2	90.9	76.7	2018	Country visits		84.8	96.4	60	92.4	94	96.4		98	92.4	2019	Terminal meeting	84.8	86.4	97.6	80	98.4	94.8	99.6	96	98	96.4
Year	Event	Br	Cam	Ind	Lao	Msia	Myr	Phi	Sin	Tha	Vie																																						
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Activity 3	To suggest a possible catch documentation system in the region																																																
Sub-activity 3.1	MFRDMD collaborated with SEAFDEC/Sec to establish and implement a pilot project of the ASEAN Catch Documentation Scheme (eACDS) in Brunei Darussalam. On-site testing of the eACDS through meetings and discussions with all the relevant stakeholders and government officials in Brunei Darussalam was conducted in March 2018. An evaluation of the eACDS implementation in Brunei Darussalam will be conducted in 2019 by SEAFDEC/TD.																																																

4. Evaluation and Major Impacts/Issues in the Overall Project Duration:

- The impact of illegal, unreported and unregulated (IUU) fishing to fishery resources and stocks in the region.
- Most countries in the Southeast Asian region have developed their respective regulations based on the FAO Legally-binding Instrument on Port State Measures (PSM) and EC Regulation 1005/2008. Therefore, it is possible for the countries to support the efforts to use trade measures to combat IUU fishing within the region.
- Countries should ensure the primary responsibility of flag state and counter measures to combat IUU fishing.

5. Publications and Others

1. Abdul-Razak L., Mazalina A., Mohd-Tamimi A.A., Katoh M and Adam L.P. (2014). Report of the Regional Core Expert Meeting on Combating IUU Fishing in Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products. 7 – 9 October 2013, Kuala Lumpur, Malaysia. SEAFDEC/MFRDMD/RM/28. 74p.
2. Mazalina A., Abdul-Razak L., Tamimi A.A. & Katoh M. (2014). Existing Fishing Practices in Small-scale Fisheries in the Southeast Asian Region. Fish for the People.
3. Abdul Razak L., Mazalina A., Tamimi A.A. and Katoh M. (2014). Impact of Implementation of the EC Regulation 1005/2008 to the Small Scale and Large Scale Fisheries of ASEAN Member Countries. Fish for the People.
4. Abdul Razak Latun (2014). Overview of JTF6-IUU Project from 2011 - 2014. Power point presented at the Regional Technical Consultation on the Regional Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain, 23-25 September 2014, Kota Kinabalu, Sabah, Malaysia. SEAFDEC Marine Fishery Resources Development and Management Department, Kuala Terengganu, Malaysia

5. SEAFDEC/MFRDMD. 2014. Report of the Regional Technical Consultation on the Regional Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain, 23-25 September 2014, Kota Kinabalu, Sabah, Malaysia. SEAFDEC Marine Fishery Resources Development and Management Department, Kuala Terengganu, Malaysia
6. SEAFDEC/MFRDMD. 2014b. Report of the Small Group Experts Meeting on Catch Documentation Scheme/System, 14-16 October 2014, Sepang, Malaysia. SEAFDEC Marine Fishery Resources Development and Management Department, Kuala Terengganu, Malaysia
7. Mazalina A., Mahyam M. I., Katoh M., Abdul-Razak L., Mohd. Tamimi A.A., Kawamura H. and Siriraksophon S. (Eds.) (2015). ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain. SEAFDEC/MFRDMD/SP/29:22pp.
8. Abdul Razak Bin Latun, Mazalina Ali, Mohd Tamimi Ali Ahmad, Abe and Virgilia Sulit. (2016). Boosting National Mechanisms to Combat IUU Fishing: Dynamism of the Southeast Asian Fisheries Sector. *Fish for the People* Vol. 14, No. 1.
9. Abdul Razak Latun, Mazalina Ali, Ahmad Adnan Nuruddin, Somboon Siriraksophon, Virgilia Sulit, and Ahmad Firdaus Siregar Abdullah , (2016). Promotion of Measures to Avert Entry of Fish and Fishery Products from IUU Fishing into the Supply Chain. *Fish for the People* Vol. 14, No.2, (Special issue).
10. Abdul Razak Latun (2016). Overview of JTF6-IUU Project from 2011 - 2016. Power point presented at the Regional Technical Consultation on Promotion of the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain, 7 - 9 March 2016, Kuala Lumpur, Malaysia.
11. Abdul-Razak L., Mazalina A., Abe and Ahmad Firdaus S. A. (2017). Report of the Regional Core Expert Meeting on Combating IUU Fishing in Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products. 7 – 9 March 2016, Kuala Lumpur, Malaysia.
12. Abdul Razak Latun, Mazalina Ali and Ahmad Firdaus Siregar Abdullah (2017). Recommended actions to implement the ASEAN Guidelines for preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain. SEAFDEC/MFRDMD.
13. Abdul Razak Latun (2017). Overview of JTF6-IUU Project from 2013 - 2017. Power point presented at the 2nd Regional Technical Consultation on Promotion of the "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain", 21-23 November 2017, AnCasa Hotel and Spa, Kuala Lumpur, Malaysia.
14. Abdul Razak Latun, Mazalina Ali and Ahmad Firdaus Siregar Abdullah (2018). The Report of 2nd Regional Technical Consultation on Promotion of the "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" 21-23 November 2017, AnCasa Hotel and Spa, Kuala Lumpur, Malaysia.
15. Abdul Razak Latun, Mazalina Ali, Raja Bidin Bin Raja Hassan and Annie Nunis Billy (2019). An Interim Report: Status of Implementation of The Regional Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into The Supply Chain: Self-evaluation by ASEAN Member States. SEAFDEC/MFRDMD/SP/41.52pp.
16. Abdul Razak Latun (2019). Overview of JTF6-IUU Project from 2013 - 2019. Power point presented at the Terminal Meeting Report of the JTF VI Project on Combating IUU Fishing in Southeast Asia through Application of Catch Certification for International Trade in Fish and Fishery Products 3-5 September 2019, Melia Kuala Lumpur Hotel, Malaysia (2019)
17. Abdul Razak Latun, Mazalina Ali, Raja Bidin Bin Raja Hassan, Adam Luke Pugas and Ahmad Firdaus Siregar Abdullah (2019). The Terminal Meeting Report of the JTF VI Project on Combating IUU

Fishing in Southeast Asia through Application of Catch Certification for International Trade in Fish and Fishery Products 3-5 September 2019, Melia Kuala Lumpur Hotel, Malaysia (2019). In press.

18. Abdul Razak Latun, Mazalina Ali, Raja Bidin Bin Raja Hassan, Adam Luke Pugas and Ahmad Firdaus Siregar Abdullah (2019). Final Project Report: JTF6 – IUU Project on Combating IUU Fishing in Southeast Asia through Application of Catch Certification for International Trade in Fish and Fishery Products. In press.

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2019**

			Project ID: 201306001
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Assistance for Capacity Building in the Region to Address International Fish Trade-related Issues		
Program Strategy No.:	V	Total Duration:	2013 - 2019
Lead Department:	Secretariat (SEC)	Lead Country:	Thailand
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 706,943
Project Partner:	None	Budget for 2019:	USD 71,860
Project Leader:	Worawit Wanchana / SEC	Project Participating Country(ies) :	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Recognizing the issues on trade in fish and fishery products are greatly discussed and driven by international market and various organizations, which rarely involve fisheries authorities and many times having less contribution for sustainable fisheries development and management aspects. A number of international instruments have recently been agreed and enforced by international organization could determine impacts on sustainable development of fisheries in the Southeast Asian region, particularly developing countries where most of fisheries contribution are coming from small-scale fisheries sub-sector. In this connection, it is important to not only reconcile the international driven issues with the promotion on sustainable fisheries development, but more active assess/evaluate the regional impact and addressing the regional concerns to the international fora are also needed.

2. Background and Justification

Since early 1990, SEAFDEC has monitored the potential impacts of international issues on fish and fishery products, and subsequently provided regional consultative forum to the ASEAN-SEAFDEC Member Countries. Though this mechanism, SEAFDEC has provided fisheries authority of the Member Countries necessary information of trade related issues and environment related task on international concerns such as the issues under UN General Assembly, WTO, FAO and CITES, as well as a large group of importing countries such as EU and USA. Through a number of the technical consultations, the results of the regional discussion and conclusion were analyzed and come up with recommendation for national/regional action plan, as well as the regional common positions to safeguard the interests of the ASEAN-SEAFDEC Member Countries at the global fora. In this connection, it is crucial that SEAFDEC should keep monitoring the emerging international fish trade-related issues as well as environment- and fisheries-related issues. Meanwhile, it is also needed to support the Member Countries through appropriate channels in order to reflect the regional collaborative efforts in managing fisheries and assist the Member Countries in formulating regional common positions, as well as push forward integration of views and concerns from fisheries agencies into those international instruments.

This project supports the 2011 Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020, #19 “ Support the competitiveness of the ASEAN fish trade through the development of procedures and programs that would certify, validate or otherwise indicate the origin of fish to reflect the need for traceability, sustainable fishing practices and food safety, in accordance with international and national requirements”.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome, and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1:	Outcome 1: increased understanding and knowledge of ASEAN Member States on the impact from the international fish trade-related issues, such as CITES, driven from market measures, IUU-fishing, etc.	Output 1: increased capacity of ASEAN Member States to address the regional interest and common positions that link to the international fish trade-related issues.	Activity 1: Monitoring and enhancing the capacity on international fish trade-related issues.
Objective 2:	Outcome 2: strengthen cooperation among ASEAN-SEAFDEC Member Countries to safeguard their fisheries and aquaculture development through the development of regional common positions on the international fish trade-related issues.	Output 2: Adopted/agreed on ASEAN-SEAFDEC common position and/or coordinated position and regional policy recommendations on international fish trade-related issues.	Activity 2: Developing the regional recommendations, common/coordinated positions, as well as regional fishery policy recommendations.
		Output 3: Increased awareness to fisheries sector and promote the regional common coordinated positions.	Activity 3: Building awareness and dissemination of the project outputs

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Monitoring and enhancing the capacity on international fish trade-related issues.	The activity implements with the aim to monitor the updated information from the international fora concerning the issues on “commercially-exploited aquatic species” related to CITES, IUU fishing, traceability system for capture fisheries (catch certification scheme and catch documentation scheme), and by-catch issues particularly marine mammal by-catch. The activity also aims to enhance capacity and knowledge of/ among ASEAN-SEAFDEC Member Countries on the current movement of the international fish trade-related issues, and to encourage countries’ participation to the international fora. In order to meet the objectives, in-depth study on specific subjects will also be carried out under this activity. Updated information and current situation on the issues from the international events will be shared to all SEAFDEC Member Countries for their reference, information and consideration.
Activity 2: Developing the regional recommendations, common/coordinated positions, as well as regional fishery policy recommendations.	This is the key activity of this project. SEAFDEC provides platform for regional consultation or even Senior Official Meeting (if required) in order to discuss and consider the international fish trade-related issues in which may impacts to the development of fisheries and aquaculture in the Southeast Asian Region. The outputs from such consultation include regional interest to be addressed at the international fora such as regional policy recommendations on specific topic/issue, ASEAN-SEAFDEC common position on specific topic (s). such documents will be further submitted to SEAFDEC Councils Directors and ASEAN mechanisms for endorsement.
Activity 3: Building awareness and dissemination of the project outputs.	Key/major outputs from the project implementation such as regional policy recommendations, ASEAN-SEAFDEC coordinated positions and ASEAN common position, will be disseminated to the public as appropriate (within and/or outside the region).

3.3 Activity, Sub-activity and Proposed Budget for 2013-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019*
Activity 1:	Sub-activity 1.1 Review status of international fish trade-related issues	700	0	0	1,000	0	1,500	650
	Sub-activity 1.2 Coordinate with other regional and international organizations	15,000	19,000	4,090	32,370	20,400	15,500	15,000
Activity 2:	Sub-activity 2.1 Provide platform to develop coordinated or common position, as well as policy recommendations	60,000	19,000	96,100	51,860	78,370	78,370	52,300
Activity 3	Sub-activity 3.1 Publicize the results within and/or outside the region	1,300	1,000	780	2,000	23,000	5,000	3,910
Sub-Total Budget		80,000	139,000	108,983	131,470	95,260	80,370	71,860

* CITES-CoP meetings will be in 2013, 2016 and 2019

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION**1. Achievements of the Project Implementation for the Present Year**

There are several outputs from the project implementation in 2019, including: (i) development of the ASEAN-SEAFDEC Common Position on the Proposed Listing of Commercially-exploited Aquatic Species into the CITES Appendices; (ii) supporting the revision of the SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020; (iii) supporting participation of some AMS to the ASEAN Working Group on the Convention on International Trade in Endangered Species on Wild Fauna and Flora and Wildlife Enforcement (15th AWG-CITES and WE) and CITES CoP-18; (iv) testing the eACDS system developed for Brunei Darussalam through training program using catch report offline technology; (v) ongoing progress in developing eACDS application in Viet Nam, Myanmar and Malaysia as requested by the countries.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Monitoring and enhancing the capacity on international fish trade-related issues.					
Sub-activity 1.1 Review status of international fish trade-related issues					
Sub-activity 1.2 Coordinate with other regional and international organizations					
Organization of Regional Meeting on Way Forward of the Resolution and Plan of Action for the ASEAN Region Towards 2020 (1) 1-2 May 2019, Bangkok (2) 10-11 September 2019, Bangkok	III	40 (15)	20 (10)	30 (15)	21,229
Activity 2 Developing the regional recommendations, common/coordinated positions, as well as regional fishery policy recommendations.					
Sub-activity 2.1 Provide platform to develop coordinated or common position, as well as policy recommendations					
Training on the use of eACDS in Brunei Darussalam from 28-31 Jan 19	II		3(1)	1	3,948
Meeting on preparation of key data elements (KDEs) and development of eACDS in Viet Nam from 25-28 March 2019	IV	6(1)	4(2)	1	1,417
Meeting on preparation of KDEs in Myanmar and development of eACDS from 4-7 Feb 19 and 30 July – 2 August 2019	IV	7(4)	4(2)	1	4,199
Meeting on preparation of KDEs in Malaysia and development of eACDS from 21-25 April 2019	IV	4(2)	4(2)	1	4,551
Organization of Regional Consultation for Development of the ASEAN-SEAFDEC Common Position on the Proposed Listing of Commercially-exploited Aquatic Species into the CITES Appendices, Bangkok, 30-31 January 2019	III	20 (8)	30 (15)	15 (7)	19,901
Participation of SEAFDEC staff to the ASEAN Working Group on the Convention on International Trade Endangered Species on Wild Fauna and Flora and Wildlife Enforcement Network (15 th AWG-CITES and WE), Malaysia, 2-4 April 2019	III	-	2 (0)	-	1,467

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Participation of SEAFDEC and CMMV Countries to the CITES CoP18, Geneva, 16-28 August 2019	III	4 (0)			20,207.24
Activity 3					
Sub-activity 3.1 Publicize the results within and/or outside the region					

Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.1 Review status of international fish trade-related issues		
Sub-activity 1.2 Coordinate with other regional and international organizations	Facilitate development of regional fisheries policy	Drafted revision of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030
Activity 2		
Sub-activity 2.1 Provide platform to develop coordinated or common position, as well as policy recommendations	<p>(1) Facilitated development of ASEAN-SEAFDEC Common Position on the Proposed Listing of Commercially-exploited Aquatic Species into the CITES Appendices</p> <p>(2) Recognized ASEAN-SEAFDEC Common Position at regional and international for a</p> <p>(3) Developed the eACDS for traceability of fish and fishery product in the ASEAN Member States</p>	<p>(1) Adopted by ASWGF, the Common Position on the Proposed Listing of Commercially -exploited Aquatic Species into the CITES Appendices</p> <p>(2) Participation of SEAFDEC and MCs to the regional and international fora; including AWG-CITES and WE Meeting; and CITES-CoP18</p> <p>(3) Cooperation with Brunei Darussalam, Viet Nam, Myanmar and Malaysia to develop and facilitate implementation of the eACDS for traceability of fish and fishery products in their respective countries</p>

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
Leaflet to introduction and promotion of eACDS	Information and promotion material	http://repository.seafdec.or.th/handle/20.500.12067/912

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1	
Sub-activity 1.2	The drafted RES&POA-2030 will be useful for providing regional policy directions where the AMS can use as the regional reference where applicable to the national programs in the next 10 years beyond the year 2020.
Activity 2	
Sub-activity 2.1	<p>Regarding the common positions of ASEAN-SEAFDEC on the proposals for listing of commercially-exploited aquatic species into CITES Appendices, the AMS could be updated on the issues and more understood the regional issues, as least one common position could be agreed among AMS on the proposal for listing the mako sharks into CITES Appendix II.</p> <p>Regarding the development of the traceability system for some AMS, the eACDS developed for Brunei Darussalam has been practiced all over the countries. Additionally, the eACDS that is developing for Malaysia, Myanmar and Viet Nam is now in the process where the countries can make use of it in very near future.</p>

6. Major Impacts/Issues

ASEAN-SEAFDEC Common Position on the Proposed Listing of Commercially-exploited Aquatic Species into the CITES Appendices: the project facilitated the development of the common positions of SEAFDEC Member Countries on the proposed listing of commercially-exploited aquatic species through the briefing and discussion provided by this project. At the regional consultation, an overview of the key issues in each proposal on the commercially-exploited aquatic species was provided based on the best scientific information by the expertise in each issue. ASEAN Member States can make use of the results from the consultation for improvement of their understanding on the key issues for appropriate decision to be made at the CITES CoP18.

Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 (RES&POA-2030): the project supports the experts from various fields in fisheries and aquaculture to participate the regional consultations for revision of the RES&POA-2020 for drafting the RES&POA-2030. During the regional consultations, key issues affecting and related to fisheries are discussed and accommodated for drafting the RES&POA-2030.

eACDS: the traceability system for catch and landing and fishery products is an effective tool for eliminating the materials from IUU fishing. The project supports the AMS in developing the eACDS for AMS upon the request. It has been learnt that value chain of fish from sea to table in some country is very complicated. The system and eACDS application is designed in specific to the procedure in their respective countries.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

Prior to the CITES Conference of Parties (CoP) 17 (in 2016) and CoP18 (in 2019), the project facilitated development of the common position of SEAFDEC countries on the commercially exploited aquatic species to be listed under CITES appendices. The documents were used as a basis for consideration by the countries during the discussion and voting at each CoP.

The draft RES&POA-2030 developed by SEAFDEC through the project's support will be finally submitted to high level of SEAFDEC and ASEAN mechanism (Minister of Japan responsible for fisheries, and AMAF, respectively).

The eACDS started development as pilot site in Brunei Darussalam since 2017, the testing is going in cooperation with Department of Fisheries, Brunei Darussalam. In parallel, the implementation of eACDS was expanded and conducted to Viet Nam, Myanmar and Malaysia as requested by each country. At present, the implementation in Viet Nam is in stage of development of eACDS and verification of its system, while in Myanmar and Malaysia is in stage of KDEs analysis and preparation to develop the system.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1	
Sub-activity 1.1	<ul style="list-style-type: none"> • Reviewing on tuna fisheries resources in the Southeast Asian region • Study on regional approach to promote the sustainable tuna fisheries in the Southeast Asian region • Study on requirement for ASEAN Catch Certification to support intra-regional trade in the Southeast Asian region • Analysis on requirement of the Regional Fishing Records to support combating IUU fishing in the region • Reviews the proposed proposal from CITES parties on listing of sharks and freshwater string ray in the CITES appendices and coordinate with SEAFDEC Member Countries on the detailed proposal • Preliminary study on conservation and management of eels resources in the Southeast Asian Region • Reviewed the issues/problems and challenge for Southeast Asian Countries to combat IUU fishing occurred within the region • Supported the development of RFVR for 24m in length and over • Meeting with FiA-Cambodia on the Development of NPOA-IUU and Improvement of Fishing Licensing System 15-17 July 2015 • Reviews and Development of an Executive Report on Addressing International Fisheries Related Issues (2015-16) • Meeting with FIA and her stakeholders on the Combating IUU Fishing, held on 29-30 January 2016 at Sihanoukville Province • Consultation visit to CCAMLR on the CDS and Cooperation on Combating IUU fishing between AMS and CCAMLR held on 18-23 January 2016 at CCAMLR, Australia • Executive summary report on Regional Initiatives Towards Combating IUU Fishing in the Southeast Asia for 2017 at ASWGFi in Singapore
Sub-activity 1.2	<ul style="list-style-type: none"> • Participation in the international events, including: • CITES-CoP16 held in Bangkok, Thailand from 3-14 March 2013 • FAO Technical Consultation on International Guidelines on Securing Sustainable Small-scale Fisheries convened in FAO, Rome from 20-14 May 2013 • The Ninth Session of the Scientific Committee of the WCPFC was held in Pohnpei, Micronesia from 6-14 August 2013 • Technical Consultation on International Guidelines on securing sustainable small-scale fisheries in FAO, Rome from 3-7 February 2014 • Asian regional consultative workshop on Capacity assessment for the implementation of new CITES listing of the sharks and manta rays during 13-15 May 2014 • 31st Session of the Committee of Fisheries from 9-13 July 2014 • 11th Meeting of the AEG-CITES on 7th-8th May 2015 at Rizqun International Hotel, Banda Seri Begawan, Brunei Darussalam • Internal Meeting of the SEAFDEC Initiatives on Combating IUU Fishing in Southeast Asian Region and Ways Forward, 13 - 14 August 2015 at Concorde Hotel (KLIA), Malaysia

List of Activities	Description of Implemented Activities
	<ul style="list-style-type: none"> • Consultation visit to CCAMLR on the CDS and Cooperation on Combating IUU fishing between AMS and CCAMLR held on 18-23 January 2016 at CCAMLR, Australia • Stakeholders consultation on sustainable fisheries development towards the ASEAN economic community: 1-2 March 2016 (In cooperation with SEAFDEC-Sweden Project) • 5th Global Fisheries Enforcement Training Workshop held on 7-11 March 2016, Auckland, New Zealand, hosted by IMCS • FAO/ Info-Fish Meeting on national and regional good practices in seafood traceability in Asia, held on 22-24 March 2016 in KOCHI, India • 12th Meeting of the AEG-CITES on 24-25 March 2016, Siem Reap, Cambodia • CITES-CoP17 24 September – 5 October 2016 at Johannesburg, South Africa • Global dialogues on Seafood Traceability: 1st ASEAN Technical Workshop • CTI-CFF Partners Meeting • Seminar on Traceability for Marine Capture Fisheries organizing by NPO-Marine Products Traceability Association, held on 22-23 May 2017 in Sapporo, Japan • First Meeting of the Parties to the 2009 FAO Agreement on Port State Measures • 16th Meeting of the Sub-Committee on Fish Trade • JSFS 85th Anniversary-Commemorative International Symposium “Fisheries Science for Future Generations” • CTI-CFF/USAID Inception Workshop: Building-Up a regional catch documentation and traceability (CDT) system and advancing fisheries management for strengthening food security in Coral Triangle Region • ASEAN-U.S. Conference on Marine Environmental Issues • ASEAN-EU High-level Dialogue on Maritime Security Cooperation • Official visit/ participation to CITES Secretariat and FAO events on International fisheries-related issues • FAO Panel “Fighting IUU Fishing and Seafood Fraud: Enhancing Traceability and Transparency through Strengthened Governance Frameworks”, 11 March 2018 • 14th Meeting of ASEAN Working Group on CITES and Wildlife Enforcement (AWG CITES-WE), Luangprabang, Lao PDR, 20-22 March 2018 • CITES International Technical Workshop on Eels (<i>Anguilla</i> spp.), London, 18-20 April 2018 • eACDS activities, Hanoi, Viet Nam, 11-14 September 2018 • eACDS activities, Yangon, Myanmar, 25-28 September 2018
Activity 2	
Sub-activity 2.1	<p>Provide platform to develop coordinated or common position, as well as policy recommendations</p> <ul style="list-style-type: none"> • Regional Consultation on the ASEAN-SEAFDEC Common Positions for the Commercially-exploited Aquatic Species to be addressed at the CITES CoP16 on 22 January 2013 in Bangkok, Thailand • Internal Expert Meeting for the 1st Draft of the Regional Guidelines for prevention the entry of fish and fishery products from IUU fishing/activities into the supply chain • Meeting with ASEAN Lead Country (Singapore) for finalizing the 2nd Draft of Regional Guidelines for prevention the entry of fish and fishery products from IUU fishing/activities into the supply chain

List of Activities	Description of Implemented Activities
	<ul style="list-style-type: none"> • 2nd Regional Consultation on Development of Regional Policy Recommendation on Sustainable Management of Eel Resources and Aquaculture Productions in the Southeast Asia, 31 August – 1 September 2014, Palembang, Indonesia • Co-organized the RTC on Regional Guidelines for Preventing the Entry of Fish and Fishery Products from IUU activities into the Supply Chain” 23-25 September 2014, Horizon Hotel, Kota Kinabaru, Malaysia • Co-organized the Small Group Expert Meeting on Catch Documentation Schemes/ System, 14-16 October 2014, Concorde Inn KLIA, Sepang, Malaysia • Co-organize the Regional Technical Consultation on ASEAN Catch Documentation System, 16-18 December 2014 • 1st RTC on Drafting the RPOA-Capacity, 24-26 Feb 2015, KL, Malaysia (cost shared with Sweden Project) • Finalized the Guideline for "Preventing The Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" on 21-22 April 2015 at MFRDMD, Malaysia • 2nd Regional Expert Consultation on the ASEAN Catch Documentation Scheme on 25th -27th May 2015, HIG Hotel Langkawi, Malaysia • Experts Group Meeting on Development of the RPOA-Capacity,19-21 August 2015, Songkhla, Thailand (cost shared with Sweden project) • Stakeholder Consultation on ACDS in BN, ID, MY, MM, PH, SG, TH and VN (Sept. -Dec. 2015) • RTC to finalize the RPOA-Capacity in December 2015, Thailand (cost shared with Sweden Project) • Stakeholders consultation on sustainable fisheries development towards the ASEAN economic community: 1-2 March 2016 (In cooperation with SEAFDEC-Sweden Project) • Expert Meeting on Commercially-exploited Aquatic Species (CEAS) held on16-17 May 2016 in Bangkok, Thailand • Regional Consultation for development of the ASEAN-SEAFDEC Common Position on the proposed listing of CEAS into the CITES Appendices (19-20 May 2016), in Bangkok, Thailand • Workshop and facilitate the coordination with all ASEAN-SEAFDEC Member Countries at the CITES CoP17, held from 24 September – 5 October 2016 at Johannesburg, South Africa • 2nd Consultation Visit for baseline survey and Introduction of the progress eACDS for Pilot Testing in Brunei Darussalam, 29 Jan. - 2 Feb. 2017 • Consultation Visit and Introduction of eACDS to DOF/MY • 1st Training on Usage of e-ACDS (issuance CD and MD) to all relevant Stakeholder in Brunei Darussalam from 19-21 June 2017, and BN-eACDS Committee Meeting on 22 June 2017 • 2nd Training on Usage of e-ACDS (issuance CC) to all relevant Stakeholder and for observers from AMSs in Brunei Darussalam from 17 to 18 October, and 2nd BN-eACDS Committee Meeting on 19 October 2017 • Consultation Visit for Introduction of eACDS to all stakeholders through the collaboration with DOF/VN (2017) • Consultation Visit and Introduction of eACDS to all stakeholders through the collaboration • 3rd Onsite Training and Kickoff the Pilot Testing on the eACDS, Brunei Darussalam, 1-6 April 2018 • Regional Technical Consultation on International Fisheries-related Issues, Bangkok, 20-22 June 2018

List of Activities	Description of Implemented Activities
	<ul style="list-style-type: none"> • Consultation visit to Myanmar for introducing eACDS and observing Port control and fishing licensing
Activity 3	
Sub-activity 3.1	<p>Development of concept notes on fisheries specific issues for endorsement at high level under ASEAN mechanism</p> <ul style="list-style-type: none"> • Development of concept note on ASEAN Catch Certification (in later called ASEAN Catch Documentations system) for consideration by 45th Council Meeting and 21st ASWGFi meeting • Development of concept note for Regional Fishing Records for vessels 24 m in length and over for consideration by 45th Council Meeting and 21st ASWGFi meeting • Reviewed CITES issues on Commercially-exploited Aquatic Species especially on sharks • Development of executive summary on the International Fish Trade-related Issues for 2013-2014 (included the results of CITES-CoP16, Development of ASEAN Catch Certification Concept Note, and Development of Regional Fishing Records of Vessels 24 m in length and over. This issue was proposed for endorsement by the 21st ASWGFi in July 2013
Sub-activity 3.2	<p>Produced and disseminated publications</p> <ul style="list-style-type: none"> • Manual and package of the User Account for RFVR Database System • Publication on Infographics on ACDS Guide (700 copies) and VDO on eACDS • Publication on eACDS Manual (700 copies) (tentative by end of DEC 2017)+ VDO on usage of eACDS • Reprint of Publication on Infographics on ACDS Guide (700 copies) and improve details in the VDO on eACDS • Publication of ACDS Concept (100 copies) • Poster on eACDS • Increased the capacity for eACDS and other system used by AMSs • eACDS publications, media and others for promoting eACDS in Southeast Asia

Notes: all of the activities implemented in 2019 appear in other tables above

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1	
Sub-activity 1.1	A number of technical reviews/studies on fisheries specific issues was carried out (<i>i.e.</i> transboundary fisheries resources (tuna fisheries, eel fisheries), national traceability system, proposed proposal for listing of commercial exploited aquatic species under the CITES Appendices, national fishing vessels record/registration)
Sub-activity 1.2	Key issues of the regional fisheries had been addressed at regional and international fora (<i>i.e.</i> CITES-CoP, WCPFC, FAO COFI and Sub-Committee on Fish Trade, ASWGFi, ASEAN-EU, ASEAN-US, AEG-CITES, RPOA-IUU, CCAMLAR, International MCS, CTI-CFF)
Activity 2	
Sub-activity 2.1	Regional platforms had been provided for: (i) discussion (updating information, exchange views, and sharing experiences among experts and national agencies concerned on fisheries specific issues); (ii) finalization regional documents (common position on the proposed proposal for listing under CITES Appendices, regional guidelines); and (iii) development (eACDS developed for Brunei Darussalam and now being tested, and being developed for Viet Nam, Myanmar, and Malaysia)

Activity 3	
Sub-activity 3.1	Regional documents on fisheries specific issues were developed for endorsement at high level under ASEAN mechanism (<i>i.e.</i> concept note on ASEAN Catch Documentation system, concept note for regional fishing vessel records for vessels 24 meters in length and over, reviewed CITES issues on commercially exploited aquatic species)
Sub-activity 3.2	

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Over the years, a number of regional policy documents, guidelines and concept notes had been developed and disseminated to all relevant stakeholders. Moreover, regional consultation platforms for discussion and facilitation the development of such documents were also provided, endorsed at high level of SEAFDEC and ASEAN mechanism, and reflected at the regional and international fora. Technical assistance to the AMS for developing the eACDS has been provided for the least developing countries in the Southeast Asian region.

5. Publications and Others

- SEAFDEC HP, Fish for the People, Technical Reports, VDO, Presentation file, etc.
- Securing the Niche of ASEAN Fish and Fishery Products in the Global Market: ASEAN Catch Documentation Scheme for Marine Capture Fisheries (Fish for the People Volume 14 Number 2:2016) <http://repository.seafdec.org/handle/20.500.12066/984>
 - Automating Marine Fisheries Catch Documentation Scheme: the eACDS (Fish for the People Volume 15 Number 3:2017) <http://repository.seafdec.org/handle/20.500.12066/1283>
 - Infographics on ACDS Guide (Second Edition) <https://www.youtube.com/watch?v=6xa9yJT6t04>
 - Brochure of introduction of eACDS <http://repository.seafdec.or.th/handle/20.500.12067/912>

Note: See also the list of documents produced by the project in the above tables.

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2019
AND
PROPOSED ACTIVITY FOR YEAR 2020**

			Project ID: 201301006
Program Categories:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2		
Program Strategy No.	VI	Total Duration:	2004 ~
Lead Department:	Training Department (TD)	Lead Country:	None
Donor/Sponsor:	Host Countries of the Survey	Total Donor Budget:	None
Project Partner:	None	Budget for 2019:	None
Project leader:	Isara Chanrachkij	Involved Country:	SEAFDEC Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Since the establishment of Southeast Asian Fisheries Development Center (SEAFDEC) in 1968, the technical supporting to SEAFDEC Member Countries (MCs) on the monitoring of fisheries resource, marine environmental situation and human resource development by SEAFDEC's research vessels has been on the major mandates of SEAFDEC. Since year 2004, M.V. SEAFDEC 2 has been granted by Government of Japan to support SEAFDEC MCs on fisheries resources and marine environmental survey in order to fulfill the needs of the SEAFDEC MCs. The major outputs from the survey are cruise reports, technical documents on fisheries resource stock status marine biodiversity, and other specific requirements, *e.g.* oceanography and marine environment, and etc. SEAFDEC has expected that the results from the survey could facilitate the establishment and implementation of comprehensive policy for sustainable management and development of marine capture fisheries both national, sub-regional and regional. The major output is included with the adequate numbers of researcher on various field, *i.e.* fisheries resources and marine environmental survey, oceanographers, fisheries biologist, fishing gear technologist, navigator and marine engineer, who has skill and experience to support the shipboard survey.

In order to achieve the expected outputs as mentioned above, SEAFDEC Training Department (TD) works in close collaboration with the SEAFDEC Member Countries and potential partners at national, sub-regional, and regional levels has supported MCs on fisheries resources and marine environmental survey. M.V. SEAFDEC 2 as major research vessel has carried out sixty (60) cruises with four (4) major components: (1) Marine fisheries resources research survey; (2) Marine environmental oceanographic research survey; (3) Onboard navigation and marine engineering training; and (4) Sea trial on fishing operation, oceanographic instruments, and fishing vessel.

In year 2019, total number of service days by M.V. SEAFDEC 2 is 57 days with 5 cruises in Thai waters (32 days) and Malaysia waters (25 days). The Marine Environment and Oceanographic Research Survey (M.V. SEAFDEC 2 No. 61-4/2019) is conducted of the environmental research survey on marine debris in the Gulf of Thailand. The cruises of human resource development are 1) Cruise No.58-2/2019 is sea trial of mid-water trawl and automatic squid jigging preparation to support Department of Fisheries Malaysia, 2) Cruise No.59-3/2019 is shipboard training for observer onboard training program of Department of Fisheries Thailand, and 3) M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl in Sarawak Waters, Malaysia (5 to 29 September 2019). In addition, M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019; 1 days) has is sea after installation of the modern navigation equipment, parts of engines and fishing accessories have been installed onboard M.V. SEAFDEC 2.

2. Background and Justification

In 2002, the Government of Japan approved the construction of a new fishery research and training vessel namely "M.V. SEAFDEC 2" along with procurement of the requisite fishing gear, fishing machinery, and survey equipment with the main purposes to conduct fishery resource and oceanographic research surveys

and shipboard training on such topic in ASEAN Countries,. Subsequently, the construction of a research vessel, M.V. SEAFDEC 2, was completed in 2003. Since 2004, research survey on fisheries resource exploration and sea trial on sampling gears, fishery oceanography, and other activities related to marine capture fisheries were conducted by M.V. SEAFDEC 2 in collaboration with SEAFDEC Member Countries. In a broader sense, the achievement of M.V. SEAFDEC 2 includes strengthen technical cooperation for effective fisheries and environmental management in the ASEAN region through the enhancement of research capability.

Due to increased operational cost for using M.V. SEAFDEC 2 that mainly caused by increased fuel price, the 40th Meeting of SEAFDEC Council (2009) agreed that the country that request to use M.V. SEAFDEC 2 should be responsible for the cost incurred by the vessel. Since 2010, the modified cost-sharing policy was therefore applied that fuel consumption of the vessel for the entire duration of the research/survey including cursing to and back to the requesting country will be responsible by the requested country(s).

At the 45th Meeting of the Council of SEAFDEC in year 2013, SEAFDEC/TD proposed some revisions of the Guidelines on the Cost Sharing Policy for operation of the M.V. SEAFDEC 2. The results was that sharing of data collected from the cruise survey using M.V. SEAFDEC 2 should be finalized at the planning meeting before the cruise survey between the requesting country and SEAFDEC. Such basic data will be kept confidential and to be used only for the SEAFDEC regional database and for future regional analysis.

In year 2018, the 41th Program Committee Meeting of SEAFDEC has adopted 2 major cruises of M.V. SEAFDEC, 2 *i.e.* 1) Small Pelagic Fishery Resources Assessment in Viet Nam Marine Waters and 2) the Utilization of the M.V. SEAFDEC 2 for the Sea Trial of Mid-water Trawl Using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia. Actual days, however occurred in year 2019 is different from the plan in the PCM 41st. Due to budget constraint, Directorate of Fisheries, Viet Nam needed to postpone the cruise in 2019 to 2020. Government of Thailand has submitted the request in mid of 2019 to utilize M.V. SEAFDEC 2 for the shipboard training on Observer onboard Program. With the international concern on the marine debris and plastic in the ocean, SEAFDEC Training Department supported by Japanese Government through Japanese Trust Fund plans to carried out a shipboard survey in December 2019. Expected total number of services days of M.V. SEAFDEC 2 in year 2019 are 60 days.

SEAFDEC Training Department has conducted the capacity improvement of M.V. SEAFDEC 2 after her service at SEAFDEC for 14 years. Modern navigation equipment, parts of engines and fishing accessories have been installed onboard M.V. SEAFDEC 2. In this connection, SEAFDEC engineers were granted for the training in Japan. They gained their knowledge on modern instruments and engine overall maintenance. In year 2020 SEAFDEC will continue improve the vessel capacity in fishing and oceanographic instruments and continue support MCs on marine fisheries and environment information collection by research vessel, and to promote the offshore fisheries resources exploration through the research and human resources capacity by utilization of SEAFDEC's Training and Research Vessels.

3. Gender Sensitivity of the Project

Shipboard activities by using M.V. SEAFDEC 2 are available for female and male researcher. However, numbers of female researcher are less than male researcher regarding to the number of bathroom and toilet arrangement onboard. Generally, the quota for female researcher is 4 persons by limited by 1 bedroom with 4 bunkers.

4. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

4.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: Assist Member Countries to conduct fisheries research resources survey	Outcome 1: National fisheries management by using the update reference data and information from the Marine Fisheries Resources and Marine Environment survey	Output 1: A set of scientific data <i>i.e.</i> fisheries resource, marine environmental and oceanography data collected from the cruise survey	Activity 1: M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine Debris in the Gulf of Thailand (December 2019; 25 days)
Objective 2: Assist Member Countries to build human resources capacity by using M.V. SEAFDEC 2	Outcome 2: National fisheries resources and marine environmental survey conducted by SEAFDEC MCs	Output 2.1 Competent researcher in the marine fisheries resources research survey	Activity 2.1: M.V. SEAFDEC 2 Cruise No.58-2/2019 (29-31 May 2019; 3 days): Sea Trial of Mid-water Trawl and Automatic Squid Jigging. M.V. SEAFDEC 2 Cruise No.59-3/2019 (26 - 30 June 2019; 5 days) is Shipboard Training for Observer onboard Training Program M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019; 25 days).
		Competent of ship staffs of SEAFDEC Training Department (Navigators and Engineers)	Activity 2.2: Program for Project for Construction of a fisheries research and Training Vessel M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019; 1 days) follow up cooperation on the project for construction of fisheries research and training vessel

4.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Marine Environment and Oceanographic Research Survey M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine Debris in the Gulf of Thailand (December 2019)	<p>Southeast Asia Region has been accused as major source of marine debris and marine plastic polluter. To investigate source of marine debris in Southeast Asia in particular Gulf of Thailand, SEAFDEC in collaboration with relevant partners, <i>e.g.</i> Tokyo University of Marine Science and Fisheries, Chulalongkorn University</p> <p>Department of Coastal Marine and Resources Thailand, to conduct Training and Research Survey on Marine Debris in the Gulf of Thailand in the Gulf of Thailand by using Research Vessel, M.V. SEAFDEC 2. The major envisage objectives are; 1) Developing standard procedure on the marine debris observation and information collection to fulfill need of baseline information on marine debris includes investigate sources of these marine debris, (ii) Increasing number of experience researchers on marine debris and related subject <i>e.g.</i> mesoplastic and microplastic,</p>

Activity	Description
	(iii) Strengthen network of oceanography scientist/researcher in Southeast Asia, and (iv) Maximizing the efficiencies and benefit of the SEAFDEC research vessel, research equipment to support on environment survey of SEAFDEC Member Countries. Survey area covers the area around the of Thailand EEZ in the Gulf of Thailand.
Activity 2 Human resources development Sub-activity 2.1 Human resources development through the shipboard survey M.V. SEAFDEC 2	M.V. SEAFDEC 2 Cruise No.58-2/2019 is sea trial of mid-water trawl and automatic squid jigging. The main objective is to prepare the fishing gear and equipment for the Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters. M.V. SEAFDEC 2 Cruise No.59-3/2019 is shipboard training for observer onboard training program of Department of Fisheries Thailand. The main objectives is support the shipboard training program on observer onboard by operating bottom trawl and pelagic longline fishing. M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019). The main objectives are determine the feasibility, acquire knowledge and experience of using mid-water trawl, fishing gear, determine the catch composition of the mid-water trawl fishing gear by M.V. SEAFDEC 2 in Malaysian waters and demonstrate automatic squid jigging machine operation for researchers and staffs of Department of Fisheries Malaysia.
Sub-activity 2.2 Program on the improve Construction of a fisheries research and training Vessel	M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019; 1 days) has an objective to follow up cooperation on the project for improve of fisheries research and training vessel, M.V. SEAFDEC 2. Modern navigation equipment, parts of engines and fishing accessories have been installed onboard M.V. SEAFDEC 2. In this connection, SEAFDEC engineers were granted for the training in Japan.

4.3 Activity, Sub-activity and Proposed Budget for 2013-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1:	Sub-activity 1.1:	Cost Sharing Policy						
Activity 2:	Sub-activity 2.1:	Cost Sharing Policy						
	Sub-activity 2.2:						Budget support by JICA Japan	
	Sub-Total Budget							

PART II: ACHIEVEMENTS OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Total numbers of service days by M.V. SEAFDEC 2 are 57 days with 5 cruises in Thai waters (32 days) and Malaysia waters (25 days). The major envisage achievements of the Project Implementation are separated into 2 main categories *i.e.* 1) Marine fisheries resources, marine environment and oceanographic research survey. The survey on the marine debris in Southeast Asia in particular Gulf of Thailand will support the developing standard procedure on the marine debris observation and information collection to fulfill need of baseline information on marine debris includes investigate sources of these marine debris, (ii) Increasing number of experience researchers on marine debris and related subject *e.g.* mesoplastic and

microplastic, (iii) Strengthen network of oceanography scientist/researcher in Southeast Asia. Sea trial of mid-water trawl in Sarawak Waters, Malaysia can support Department of Fisheries Malaysia on the information and reference of operations of the midwater trawl both fish finder equipment, depth detection devices, trawl gear and its operation both net setting including fish searching and depth indicators for monitoring the gear performance. These will support the promotion of midwater fisheries of Malaysia. 2) Human resource development on experience researchers on marine fisheries resources and marine environment of SEAFDEC Member Countries. There are 32 trainees from Thailand and Malaysia participate in the training cruises of M.V. SEAFDEC 2. In addition SEAFDEC expects 20 trainees from Thailand to practices the identification and determining on the source and assess the marine debris in the Gulf of Thailand. Total SEAFDEC staffs acquire experience on the shipboards operation and fisheries and environment survey are 21 SEAFDEC staffs.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Marine Environment and Oceanographic Research Survey M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine Debris in the Gulf of Thailand (December 2019)	I	20(4)	20(1)		
Activity 2 Human resources development	II				
Sub-activity 2.1 Human resources development through the shipboard survey M.V. SEAFDEC 2					
M.V. SEAFDEC 2 Cruise No.58-2/2019 (29-31 May 2019; 3 days): Sea Trial of Mid-water Trawl and Automatic Squid Jigging.	-		21(0)		
M.V. SEAFDEC 2 Cruise No.59-3/2019 (26 - 30 June 2019; 5 days) is Shipboard Training for Observer onboard Training Program	17(0)		21(0)		
M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019; 25 days).	15(0)		21(0)		
Sub-activity 2.2 Program on the improve Construction of a fisheries research and training Vessel M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019; 1 days)	-		15(0)		

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Marine Environment and Oceanographic Research Survey M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine	Researcher of SEAFDEC MCs get knowledge and experience on the marine debris survey by using research vessel	The baseline data and present status of marine debris and related subject <i>e.g.</i> mesoplactic and microplastic situation in the Gulf of Thailand will be collected for scientific reference. Researchers of SEAFDEC MCs get knowledge, skill, and experience on marine debris survey of the researchers of SEAFDEC Member Countries in

Planned activity	Expected outcome/output	Achievements
Debris in the Gulf of Thailand (December 2019; 23 days)	Complete sampling survey stations and Report on the marine debris observation in the Gulf of Thailand	addition, the promoting and developing the marine debris study in Thailand has been strengthened. In this connection, the regional network on the marine debris and related subject <i>e.g.</i> mesoplastic and microplastic scientists in the Gulf of Thailand sub-region.
Activity 2 Human resources development		
M.V. SEAFDEC 2 Cruise No.58-2/2019 Sea trial of mid-water trawl and automatic squid jigging (29-31 May 2019; 3 days)	The main objective is to prepare the fishing gear and equipment for the	All fishing gear and accessories <i>i.e.</i> mid-water trawl and automatic squid jigging were ready for the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019).
M.V. SEAFDEC 2 Cruise No.59-3/2019 Shipboard Training for Observer onboard Training Program of Department of Fisheries Thailand. (26-30 June 2019; 5 days)	The main objective is to provide shipboard training program on observer onboard by operating bottom trawl and pelagic longline fishing.	Main fishing activities bottom trawl and pelagic longline (for Mackerel) fishing operations were carried out in this cruise. Trainees observed the catch and fill in fishing log and record.
M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019; 25 days).	The main objectives are determination the feasibility and acquire knowledge and experience of using mid-water trawl and automatic squid jigging machine, as well as catch composition of the mid-water trawl and automatic squid jigging machine operation.	There are total of ten (10) mid-water trawl fishing operations and three (3) automatic fishing demonstrations. Total of fifteen (15) oceanographic survey stations would be conducted during sea trial, after the completion of the mid-water trawl operation. Due to the severe weather and sea condition M.V. SEAFDEC 2 sheltered at Labuan jetty for 3 days. The operation cannot completely according to the original plan.
Sub-activity 2.2: M.V. SEAFDEC 2 Cruise No.57-1/2019 sea trial of M.V. SEAFDEC 2 in the improvement program of M.V. SEAFDEC 2 (19 March 2019; 1 days)	Competent SEAFDEC navigators and engineers in the improvement of M.V. SEAFDEC 2	1) Navigators of M.V. SEAFDEC 2 understand and be able to operate the new instrument <i>e.g.</i> navigation equipment, communication equipment on board M.V. SEAFDEC2 2) Engineers of M.V. SEAFDEC 2 get knowledge and experience on engine maintenance of main engine and auxiliary engine and deck machineries.

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
1) Draft cruise report of M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019)	Hard copy	
2) Draft cruise report of M.V. SEAFDEC 2 Cruise No.58-2/2019 Sea trial of mid-water trawl and automatic squid jigging. (29-31 May 2019)	Hard copy	
3) Draft cruise report of M.V. SEAFDEC 2 Cruise No.59-3/2019 Shipboard Training for Observer onboard Training Program of Department of Fisheries Thailand. (26-30 June 2019)	Hard copy	
4) Draft cruise report of M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019).	Hard copy	

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
M.V. SEAFDEC 2 Cruise No.58-2/2019 Sea trial of mid-water trawl and automatic squid jigging (29-31 May 2019; 3 days)	SEAFDEC researchers understood the mid-water trawl and automatic squid jigging operations and the necessary equipment installation onboard M.V. SEAFDEC 2.
M.V. SEAFDEC 2 Cruise No.59-3/2019 Shipboard Training for Observer onboard Training Program of Department of Fisheries Thailand. (26-30 June 2019; 5 days)	All trainees were interested, well cooperated and learned the fishing methods, fish sorting practices, and experienced living onboard. Due to limited fishing ground and fishing time, only few operations can conduct fishing the survey that may not fulfill all experience in the professional fishing however they acquired all knowledge that should be applied in the observer onboard operation in oversea area.
M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019; 25 days).	Researcher of the Department of Fisheries Malaysia acquire knowledge and experience of using mid-water trawl and automatic squid jigging fishing operations. They understand performance and characteristics of the mid-water trawl, the factors on the successfully in capture pelagic species by using mid-water trawl, as well as the basic required equipment <i>e.g.</i> echo-sounder, scanning sonar. Additionally, experiences and expertise are also considered very important keys to success;
M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine Debris in the Gulf of Thailand (December 2019; 25 days)	Activity has not yet implemented so that none of evaluation from participants.

6. Major Impacts/Issues

The survey has constraint with the weather condition in Sarawak waters. Number of trawl operation and survey days was reduced from the original.

Midwater trawling with depth sensor made operation easy to maneuver the fishing gears. However M.V. SEAFDEC 2 has not yet finished improvement of some scientific and survey equipment *e.g.* Scanmar Trawl-eye®, Depth sensor, and etc., so that efficiency of trawling operation had not fully obtained during the survey.

Big fish school searching could not search during the survey so that catch from mid-water trawling operations are low. In addition, the sea surface temperature during the survey was high that should be one major impact to the occurrence of fish school during the sea trial in Sarawak waters, Malaysia.

7. Summary of Project Achievements

Project will continue to support SEAFDEC MCs in year 2021. The operation days of M.V. SEAFDEC 2 since year 2004 is 1,604 service days. There are 1,371 days support the national fisheries resources and environment research survey and 234 days support sub-regional fisheries resources and environment research survey.

In year 2019, M.V. SEAFDEC 2 has finished improvement of the navigation instruments, parts of engines and fishing accessories that have been installed onboard M.V. SEAFDEC 2. Scanmar sensors are renews and refurbished. However scientific echo sounder, Simrad EK series has not been installed onboard M.V. SEAFDEC 2 due to high cost. In year 2020, SEAFDEC continues to support Member Countries in 2 main activities *i.e.* 1) Marine fisheries resources, marine environment and oceanographic research survey and 2) Human resource development on experience researchers on marine fisheries resources and marine environment.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, SEAFDEC Training Department (TD) continues closely collaborated with the SEAFDEC Member Countries and potential partners at national, sub-regional, and regional levels to support MCs on fisheries resources and marine environmental survey. M.V. SEAFDEC 2. The major components of utilization of M.V. SEAFDEC 2 are (1) Marine fisheries resources research survey; (2) Marine environmental oceanographic research survey; (3) Onboard navigation and marine engineering training; and (4) Sea trial on fishing operation, oceanographic instruments, and fishing vessel.

SEAFDEC/TD will seek for opportunity to learn and improve the hydroacoustic equipment *e.g.* scientific echo sounder to investigate abundance of small pelagic resources, bottom mapping sonar to investigate the bottom characteristic of fishing ground which can support to SEAFDEC MCs

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome 1:	National fisheries management by using the update reference data and information from the Marine Fisheries Resources and Marine Environment survey	-
Output 1:	A set of scientific data <i>i.e.</i> fisheries resource, marine environmental and oceanography data collected from the cruise survey	-
Activity 1.1	Pending for the requesting in the 42 nd PCM	-
Outcome 2:	National fisheries resources and marine environmental survey conducted by SEAFDEC MCs	-
Output 1:	Competent researcher in the marine fisheries resources research survey	-
Activity 2.1	Pending for the requesting in the 42 nd PCM	-
Output 2:	Competent of SEAFDEC ship staffs (Navigators and Engineers) and researchers	-
Activity 2.3	Planning after for the requesting of SEAFDEC MCs on the utilization of M.V. SEAFDEC 2 in the 42 nd PCM	-

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:	Pending for requesting from Member Countries											
Activity 1.1												
Output 2:												
Activity 2.1												
Activity 2.2												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Activity 1. Marine Environment and Oceanographic Research Survey	A set of scientific data, <i>i.e.</i> fisheries resource, marine environmental and oceanography data collected from the cruise survey
Activity 2 Human resources development	1. Increase number of competent researchers, in the marine fisheries resources research survey. 2. Skill and experience of ship staffs of SEAFDEC Training Department (Navigators and Engineers)

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

			Project ID: 201306002
Program Category:	ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Strengthening SEAFDEC Network for Sustainable Fisheries		
Program Strategy No. :	VI	Total Duration:	2014 - 2019
Lead Department:	Secretariat (SEC)	Lead Country:	Indonesia
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 399,454
Project Partner:	None	Budget for 2019:	USD 52,810
Project Leader:	Worawit Wanchana / SEC	Project Participating Country(ies):	All Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

When dealing with international and regional fisheries related issues that might affect the sustainable development and management of fisheries and aquaculture, it is necessary to strengthen SEAFDEC network with all ASEAN Member States, as well as inter-agencies coordination at regional and country levels. In order to ensure that all of SEAFDEC programs and activities meet the requirements of the SEAFDEC Member Countries, aim of this project is to monitor and evaluate all SEAFDEC programs. In addition, the project also supports the dissemination of the results/outputs from activities/programs through the SEAFDEC quarterly publications such as Fish for the People.

2. Background and Justification

SEAFDEC has been working on the promotion of Sustainable Fisheries Development in the Southeast Asian region since its establishment in 1967. The SEAFDEC program frameworks to support Member Countries has been significantly changed in 1998 when SEAFDEC adopted the Resolution on SEAFDEC Strategic plans at the 30th Meeting of the SEAFDEC Council and more clear after the new millennium in 2001 when ASEAN-SEAFDEC adopted the Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region” as well as the new decade Resolution and Plan of Action on Sustainable Fisheries for Food Security toward 2020 in 2011 as a policy guidelines for SEAFDEC and Member Countries. To support the implementation of the Resolution and Plan of Action, taking into account environmental changes and many policy emerging issues pressing at global and regional levels including the problems of IUU fishing, SEAFDEC therefore proposes a continuing project to strengthening SEAFDEC network among ASEAN country in order to move forward on sustainable utilization of fisheries resources in the region. In conjunction to this, the strengthening cooperation within the region and Member Countries needs to be strengthened and included in the project framework in order to share and exchange information and transferring messages/information to work together to meet the final goal of the ASEAN SEAFDEC Resolutions and Plan of Action that has been committed by all Member Countries.

In addition, to ensure that proposed activities to support Member Countries could meet the final goal as proposed, the monitoring and evaluation of overall SEAFDEC programs will be carried out. The regional outputs and publications from SEAFDEC activities will then be published/disseminated and shared among Member Countries and with other regional and international organizations through the quarterly magazine or the specific publication such as Fish for the People.

This project supports the 2011 ASEAN-SEAFDEC Resolution No. 3 “ Strengthen human capacity of relevant stakeholders through mobilization of resources and the harmonization of initiatives that support fisheries communities and governments, with a special focus on the women and youth”. The Project also supports the Resolution No. 8 on “ Foster cooperation among ASEAN Member Countries and with international and regional organizations in combating IUU fishing”.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1:	Outcome 1: Enhanced regional coordination and collaboration	Output 1: Strengthened cooperation with ASEAN Member Countries through Regional Fisheries Policy Network (RFPN) and ASEAN higher authority on the results of Fisheries Consultative Group / ASEAN SEAFDEC Strategic Partnership (FCG/ASSP) programs	Activity 1.1: Support and strengthen the RFPN members stationed at SEAFDEC Secretariat Activity 1.2: Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs
Objective 2:	Outcome 2: Strengthened monitoring and evaluation of the SEAFDEC programs and projects	Output 2: the update/progress/output of the project activities are regularly monitored and evaluated	Activity 2.1: Monitoring and evaluation of SEAFDEC programs/project activities
Objective 3:	Outcome 3: Strengthened the information dissemination of SEAFDEC projects results	Output 3: Outputs/outcomes of SEAFDEC projects are compiled and disseminated	Activity 3.1: Produce and disseminate SEAFDEC special publications <i>i.e.</i> Fish for the People

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	RFPN members are fishery officers from ASEAN Member States who are invited and stationed at SEAFDEC-Secretariat, and to be involved in activities of SEAFDEC especially, in terms of coordination with their own countries. In this activity, SEAFDEC supports the expenditures of RFPN members' stationing at SEAFDEC/Secretariat as well as business trip to attend related meeting in the region with an aim of enhancing capacity of RFPN Members.
Activity 1 1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	The roles of ASEAN lead countries under the collaborative program of the FCG/ASSP mechanism would be strengthened. It is expected that regional program implemented by SEAFDEC should be coordinated with lead countries to ensure highest benefit of the activities meet the requirements of region. Through the communication with lead country, and support from ASEAN countries during the ASEAN forum, ASEAN lead country could play the role to lead discussion and support the project.

Activity	Description
Activity 2 2.1 Monitor and evaluation of SEAFDEC programs/project activities	Aside from the SEAFDEC program committee meeting, this would be linked to the implementation of the Resolution and Plan of Action and SEAFDEC Program framework. The evaluation aims to answer specific management questions and to judge the overall value of an endeavor and supply lessons learned to improve future actions, planning and decision-making. Evaluations commonly seek to determine the efficiency, effectiveness, impact, sustainability and the relevance of the project or organization's objectives.
Activity 3 3.1 Produce and disseminate SEAFDEC special publications	Based on the project implementations, the project results are encouraged to publish in the SEAFDEC publications such as Fish For the People, in order to enhance its visibility to the Member Countries, regional and international arenas.

3.3 Activity, Sub-activity and Proposed Budget for 2014-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1:	1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	32,000	32,000	32,000	32,000	32,000	32,000	32,000
	1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	0	1,000	8,500	10,500	8,000	10,500	9,500
Activity 2:	2.1 Monitor and evaluation of SEAFDEC programs/project activities	16,000	16,000	6,500	2,500	2,000	2,500	2,000
Activity 3:	3.1 Produce and disseminate of SEAFDEC special publications (Fish for the People)	7,500	7,500	9,000	9,000	12,000	25,644	9,310
Sub-Total Budget		55,500	56,500	56,000	54,000	54,000	70,644	52,810

PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

The key achievements of the project implementation for the year 2019 are the continued support and capacity building of the 3 RFPN members from Cambodia, Lao PDR, and Viet Nam to station at the SEAFDEC Secretariat for a year, enhanced the effective management of the SEAFDEC programs through the in collaboration with TD. The output, outcomes and project results were published through the SEAFDEC publications such as Fish for the People, in order to enhance its visibility to the Member Countries, regional and international levels .

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1					
Sub-activity 1.1 3 Regional Fisheries Policy Network (RFPNs) for Cambodia, Lao PDR, and Viet Nam were supported	II	3 (1)	-	-	25,107 (ongoing)

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Sub-activity 1.2 Enhanced RFPN members capacity through participations of ASEAN-SEAFDEC Meetings as follows:	II	3 (1)	-	-	-
Regional Consultation for Development of the ASEAN-SEAFDEC Common Position on the Proposed Listing of Commercially-exploited Aquatic Species into the CITES Appendices on 30-31 January 2019, Bangkok, Thailand					
Inception Meeting on “Strengthening the Effective Management of Inland Fisheries and Aquaculture in ASEAN Member States with GIS and RS Technology” on 1-2 February 2019, SEAFDEC Training Department, Samut Prakan, Thailand					
Regional Meeting on Way Forward of the Resolution and Plan of Action for the ASEAN Region Towards 2020 on 1-2 May 2019, Century Park Hotel, Bangkok, Thailand					
ASEAN-SEAFDEC Regional Meeting the Resolution and Plan of Action for the ASEAN Region Towards 2030 on 10-11 September 2019, Bangkok, Thailand					
Activity 2					
Sub-activity 2.1 Monitoring and review implementation of the ASEAN-SEAFDEC Resolution and Plan of Action	I	-	-	-	
Activity 3					
Sub-activity 3.1 Publication and Dissemination of the Fish for the People (Vol. 17, No. 1, 2, & 3)	II	-	-	-	8,753 (Ongoing)

**Remarks Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).
Budget spent till October 2019**

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.1 Regional Fisheries Policy Network (RFPN members) for Cambodia, Lao PDR and Viet Nam were supported	Strengthened cooperation with ASEAN Member Countries through the RFPNs coordination on the Results of FCG/ASSP program; and building the capacity of RFPNs through their participations to the SEAFDEC forum	Fishery officials from Cambodia, Lao PDR, and Viet Nam (3 persons as RFPN members) were stationed at SEAFDEC Secretariat. They involvement in several SEAFDEC activities could greatly contribute to smooth coordination between SEAFDEC and their own countries for technical matters and smooth arrangements of the SEAFDEC project implementations.
Sub-activity 1.2 Enhanced 2 RFPN members' capacity through participations of ASEAN-SEAFDEC meetings/assignments as follows		RFPNs gained the knowledge on various subjects related to development of regional policy recommendations and plan of actions on the effectiveness fisheries management and combating IUU fishing in the ASEAN region. Beside that, RFPN members' English skills and proficiency were enhanced through the assignment on report writing when they were attending SEAFDEC meeting In addition, the RFPN was assign to gain knowledge by developing the Country Profile on Fisheries. The outputs were presented and upload to SEAFDEC website before end of 2019.
Activity 2		
Sub-activity 2.1 Monitoring and review implementation of the ASEAN-SEAFDEC Resolution and Plan of Action (in relation to CCRF)	Strengthened monitoring and evaluation of the SEAFDEC programs and projects	The country implementation on ASEAN-SEAFDEC Resolution and Plan of Action was compiled for further reviews and report.
Activity 3		
Sub-activity 3.1 Publication and Dissemination of the Fish for the people	Strengthened the information dissemination of SEAFDEC projects results	3 volumes of Fish for the People (approximately 3,000 copies) were published and disseminated to worldwide institutions related to fisheries (Vol. 17, No. 1, 2, 3)

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
Fish for the People Vol. 17 No. 1	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-17-no-1/
Fish for the People Vol. 17 No. 2	Magazine	http://repository.seafdec.org/bitstream/handle/20.500.12066/5522/SP17-2.pdf?sequence=1&isAllowed=y
Fish for the People Vol. 17 No. 3	Magazine	Will be produced on January 2020

5. Evaluation from Participants of Member Countries for WS and Training Course

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	No existing current method/mechanism to evaluate this activity
Sub-activity 1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	No existing current method/mechanism to evaluate this activity

Planned activity	Evaluation/ Views from Participants
Activity 2	
Sub-activity 2.1 Monitoring and evaluation of SEAFDEC programs/project activities	Projects and activities of SEAFDEC were evaluated through its Program Committee Meeting conducting annually.
Activity 3	
Sub-activity 3.1 Produce and disseminate SEAFDEC special publications	Number of publications disseminated to the Member Countries and other relevant international, regional, and national organizations.

6. Major Impacts/Issues

Regional Fisheries Policy Network

SEAFDEC received nomination letter delayed.

Collaborative Research under arrangements of NFU's T/S KOYO MARU research/training vessel

Researchers of the Participating countries enhanced their knowledge and skill for conducting marine research/study. At the same time, results from the survey could be use/accommodate with other national relevant information/data to be further used as a basis for improvement of marine capture fisheries in their respective countries. Over the years, a number of countries participated to this collaborative arrangements, including Cambodia, Myanmar, Thailand, and Viet Nam. Since 2018, this activity was postponed to 2020.

Fish for the People

This is a special publication produced by SEAFDEC to promote sustainable fisheries for food security in the ASEAN region through contribution of various authors who have experiences and works in the region on sustainable development of fisheries and aquaculture. Key issues and challenges as well as way forwards to promote sustainable development of fisheries for specific topic were publicized through this publication recognizing the fact that undertaking responsible fisheries is crucial in ensuring the sustainability of fisheries in Southeast Asia.

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Abstract of Achievements in the Overall Project Duration

Regional Fisheries Policy Network

Since 2014, SEAFDEC supported RFPN members through funding supported by Japanese Trust Fund 3 persons in each year (List of RFPN since 2014-2019 appears as Annex 1). The RFPN not had roles only in the effective and smooth implementation of SEAFDEC initiatives/program of activities, but also in terms of human resource development for their respective countries.

Fish for the People

This is a special publication produced by SEAFDEC to promote sustainable fisheries for food security in the ASEAN region through contribution of various authors who have experiences and works in the region on sustainable development of fisheries and aquaculture. Key issues and challenges as well as way

forwards to promote sustainable development of fisheries for specific topic were publicized through this publication recognizing the fact that undertaking responsible fisheries is crucial in ensuring the sustainability of fisheries in Southeast Asia. Since 2014, SEAFDEC was produced the publication on Fish for the People 6 volumes (Total 18 copies) and were disseminated to SEAFDEC Member Countries, and other relevant international, regional, and national organizations.

2. Implemented Activities/sub-activities in the Overall Project Duration

List of Activities	Description of Implemented Activities
Activity 1	
Sub-activity 1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	<ul style="list-style-type: none"> Continued support the RFPNs for three countries namely Cambodia, Lao PDR and Viet Nam to work and learn on policy development for ASEAN Member States and other management at regional levels
Sub-activity 1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	<ul style="list-style-type: none"> Continued enhance the cooperation with AMSs and other SEAFDEC partnership to address the awareness on Fisheries Related Issues and other important issues that might impact to the Region
Activity 2	
Sub-activity 2.1 Monitoring and evaluation of SEAFDEC programs/project activities	<ul style="list-style-type: none"> SEAFDEC programs/project activities would be linked to the implementation of the Resolution and Plan of Action and SEAFDEC Program framework
Activity 3	
Sub-activity 3.1 Produce and disseminate SEAFDEC special publications	<ul style="list-style-type: none"> Continued publish and dissemination of the Fish for the People, to enhance its visibility to the Member Countries, regional and international arenas

3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration:

List of Activities	Achievements and Outcomes/Outputs of Activities
Activity 1	
Sub-activity 1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	<ul style="list-style-type: none"> Enhanced knowledge and understanding of the 3-RFPN members on SEAFDEC policy, project implementations and activities; Gained experiences in writing the report of the meeting and improved their working performance; Learned the traditional and custom of AMSs countries for future work and cooperation among countries.
Sub-activity 1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	<ul style="list-style-type: none"> Strengthened cooperation with SEAFDEC Partnership to address the awareness on Fisheries Related Issues and other important issues that might impact to the Region
Activity 2	
Sub-activity 2.1 Monitoring and evaluation of SEAFDEC programs/project activities	<ul style="list-style-type: none"> Monitoring and evaluation plans should be created after the planning phase and before the design phase of a program or intervention Improved monitoring and evaluation system
Activity 3	
Sub-activity 3.1 Produce and disseminate SEAFDEC special publications	<ul style="list-style-type: none"> Published and disseminated 2 volumes of SEAFDEC Publication "Fish For the People" (approx. 3,000 copies/volume)

4. Evaluation and Major Impacts/Issues in the Overall Project Duration

Regional Fisheries Policy Network

None of evaluation because of RFPN came from different part of fisheries so difficulty to evaluate.

Fish for the People

Number of publications was produced and disseminated approximately 30,000 copies/volume to SEAFDEC Member Countries, and other relevant international, regional, and national organizations..

5. Publications and Others

- List of publication on Fish for the People (2014-2019)

List of completed publications for the year 2014-2019	Type of media	Attached e-file
Fish for the People Vol.12 No.1	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-12-no-1/
Fish for the People Vol.12 No.2	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-12-no-2/
Fish for the People Vol.12 No.3	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-12-no-3-2/
Fish for the People Vol.13 No.1	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-13-no-1-2/
Fish for the People Vol.13 No.2	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-13-no-2/
Fish for the People Vol.13 No.3	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-13-no-3/
Fish for the People Vol.14 No.1	Magazine	http://www.seafdec.org/download/fish-people-vol-14-no-1/
Fish for the People Vol.14 No.2	Magazine	http://www.seafdec.org/download/fish-people-volume-14-no-2/
Fish for the People Vol.14 No.3	Magazine	http://www.seafdec.org/download/fish-people-vol-14-no-3/
Fish for the People Vol.15 No.1	Magazine	http://www.seafdec.org/download/sp15-1/
Fish for the People Vol.15 No.2	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-15-no-2/
Fish for the People Vol.15 No.3	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-15-no-3/
Fish for the People Vol.16 No.1	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-16-no-1/
Fish for the People Vol.16 No.2	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-16-no-2/
Fish for the People Vol.16 No.3	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-16-no-3/
Fish for the People Vol.17 No.1	Magazine	http://repository.seafdec.org/bitstream/handle/20.500.12066/5522/SP17-2.pdf?sequence=1&isAllowed=y
Fish for the People Vol.17 No.2	Magazine	http://www.seafdec.org/download/fish-for-the-people-vol-17-no-1/

List of Regional Fisheries Policy Network 2014-2019

Year	Cambodia	Lao PDR	Viet Nam
2014	Ms. Chin Leakhena	Mr. Chainuk Phakhounthong	Mr. Nguyen The Hoang
2015	Ms. Chin Leakhena	Ms. Phongsavanh Sengsomphou	Mr. Nguyen Van Phuc
2016	Mr. Heng Samay	Ms. Phongsavanh Sengsomphou	Ms. Nguyen Huong Tra
2017	-	Mr. Kongkham Vonglorkham	Mr. Nguyen Tuan Uyen
2018	Mr. Thuch Panha	Ms. Vanny Sengkapeo	-
2019	Mr. Kamsan Ngin	Mr. Khambor Souliphone	Ms. Vu Thi Phuong Thanh

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2019

			Project ID: 201306003
Program Categories:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia		
Program Thrust:	Special Project	Total Duration:	2013-2019
Lead Department:	SEAFDEC/Secretariat	Lead Country:	Indonesia
Donor/Sponsor:	Sida (through the Embassy of Sweden, Bangkok)	Total Donor Budget:	Total budget 48 Millions SEK
Project Partner:	ASEAN, FAO, BOBLME, CTI-CFF, RPOA-IUU, MRC, UNEP, IUCN/MFF, ILO, USAID, UNEP/GEF	Involved Country:	ASEAN Member States
Project leader:	Ms. Pattaratjit Kaewnuratchadasorn SEAFDEC-Sweden Project Manager		

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

In Southeast Asia, environmental degradation, overcapacity (illegal and destructive fishing) and threats from climate variability and climate change are seen as the significant problems for fisheries and aquatic habitats, threatening their sustainability and the livelihoods of the millions of people dependent on aquatic resources. The SEAFDEC-Sweden Project implemented the collaborative activities on “*Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia*” from 2013-2019, with the outcome objective toward “Sustainable use of aquatic resources and reduced vulnerability to climate change by coastal/rural (fishing) communities in the ASEAN region.” Specifically, the Project aimed at strengthening capacity among the AMSs on management of fisheries and habitats, management of fishing capacity and combating IUU fishing through regional and sub-regional cooperation and on-site cooperation with regional and national partners for a broader coverage. The perspective include the establishment of sub-regional agreements or other arrangements of relevance to fisheries and habitat management in the Gulf of Thailand; Andaman Sea and to support processes for the cooperation among countries in the Sulu-Sulawesi Seas and the Mekong River Region. Number of activities also focused local capacity by building up the ability to adapt to the effects of climate change, manage natural resources, conserve or restore critical habitats, develop and manage diversified livelihood options and alternative income-earning opportunities, and promote gender equity and equality, the Project engaged the partnership of NGOs and CSOs with considerable experience in rural development and a strong presence in the project sites. These are CORIN-Asia Cambodia, Learning Institute of Cambodia (coastal and Mekong), CORIN-Asia Myanmar, and Sustainable Development Foundation (SDF, Thailand). The Project is coordinated by the SEAFDEC Secretariat and working in partnership with Technical Departments namely: Training Department (TD), Marine Fishery Resources Development and Management Department (MFRDMD).

2. Background and Justification

The Project focuses improve social well-being and environmental health by improving the management of fisheries resources including the species and their habitats, management of fishing capacity, combating illegal, unreported, unregulated (IUU) and destructive fishing. The Project has been supporting the SEAFDEC strategies for the region and addressing the emerging and persistent international issues in the fisheries sector. SEAFDEC’s strategies are also in line with relevant Sustainable Development Goals (SDGs) and many other international conventions and instruments in related to fisheries.

The SEAFDEC-Sweden Project implemented under ASEAN-SEAFDEC Strategic Partnership (ASSP) that have been implemented several regional activities to support the implementation of regional policies and priorities as well as to support national efforts in addressing habitat and fisheries management and the management of

fishing capacity. The SEAFDEC-Sweden Project supported and enhanced the capacity of AMS to response the commitment of ASEAN Member Countries to sustainable development, social well-being and improved working conditions within the context of an ecosystems approach to fisheries including efforts to combat illegal (IUU) fishing, were confirmed by the adoption of the 2011 Resolution and Plan of Action. The 2011 Resolution and Plan of Action were adopted during ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security towards 2020: Fish for the People 2020 “Adaptation to a Changing Environment” (Bangkok 16 June 2011). SEAFDEC was instrumental in facilitating the process to develop the 2011 Resolution and Plan of Action.

The current SEAFDEC framework, the commitment to policy development and implementation was reaffirmed in the November 2017 Resolution on the future of SEAFDEC: Vision, Mission, and Strategies towards 2030. The Resolution supports collective efforts towards the pursuit of the vision of “Sustainable management and development of fisheries and aquaculture to contribute to food security, poverty alleviation and livelihood of people in the Southeast Asian region.” Through such framework, the SEAFDEC-Sweden Project supported SEAFDEC and ASEAN Member States to addressed these critical issues to accomplish the goals.

3. Gender Sensitivity of the Project

Throughout the project implementation, the project conducted the several activities in relation to the gender perspectives and enhancing the status of women and strengthening the role of men and women at different levels. Several progresses were made at international, regional, sub-regional and local levels. The Project supported the institutional capacity and knowledge of staff SEAFDEC and its Technical Departments on gender integration and latest achievement is the adoption of the SEAFDEC Gender Strategy and action plans. The Project reported the sex-disaggregated in list of attendances in the Project activities. The details explain the later part.

4. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

4.1 Overall Objectives

Sustainable use of aquatic resources and reduced vulnerability to climate change by coastal/rural (fishing) communities in the ASEAN region.

- Steps to bridge between output and outcome objectives 1: Implementation of regional and sub-regional aquatic resources management actions by national institutions and organizations
- Steps to bridge between output and outcome objectives 2: Establishment and implementation of regional and sub-regional fisheries and habitat management agreements and action plans.

Three output objectives, namely:

1. Capacity built for integration of habitat & fisheries management and adaptation to climate change
2. Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)
3. Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements

Outputs, Indicators and Activities

Table 1: Log Frame on Project Follow-up, Monitoring and Evaluation

Outcome objectives	Outputs objectives	Activity as summarized from RAF indicated areas	Key Performance Indicators (Results Assessment Framework (RAF) targets)
Sustainable use of aquatic resources and reduced vulnerability to climate change by	1: Capacity built for integration of habitat & fisheries management and adaptation to climate	1:1/1.3 Awareness improved and capacity/knowledge enhanced on habitat and fisheries management 1:2 Collaboration facilitated and strengthened 1:4/1.5	At least one sub-regional and sub-sub-regional events/year with focus on habitat/fisheries management (reaching 250 with partners involved (2019 - 1,250/awareness)

Outcome objectives	Outputs objectives	Activity as summarized from RAF indicated areas	Key Performance Indicators (Results Assessment Framework (RAF) targets)
coastal/rural (fishing) communities in the ASEAN Region	change	Dialogues conducted and facilitated at bilateral and sub-regional level on trans-boundary resources and habitat management Trans-boundary and (sub-) regional agreements on habitat and fisheries management established. 1:6 Capacity built and support provided to the implementation of agreements and action plans through the organizations and/or support to sub-regional, bilateral and on-site events.	
	2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)	2:1 Awareness raised of the need for registration of (all) fishing vessel and the importance to have proper licenses to fish (vessels, gear and people) 2:2 Links and cooperation maintained and strengthened between SEAFDEC and international and regional organizations 2:3/2.5 Information sharing of relevance to the monitoring and control of fishing capacity/effort actively promoted and facilitated MCS networks has been established 2:4 Agreements and/or action plans has been established to monitor, record and control active fishing capacity together with ASEAN-wide agreements (RPOA's) New 2.5 Capacity built and support provided to the implementation of agreements and action plans on the management of fishing capacity and combating of illegal fishing	One regional or sub-regional event organized (with partners) where fishing vessel registration, licensing, IUU fishing and labour issues will be discussed involving relevant (two or more) departments with around 60 participants
	3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements	3:1/3.2 Collaboration is maintained and strengthened between SEAFDEC and other regional and international organizations 3:3 Capacity increased to build upon national laws and policies Sub-regional and bilateral agreements established and agreed upon 3:4 Important international conventions and regional agreements reviewed 3:5 Information sharing promoted and facilitated among ASEAN countries on national legislation and institutional	Follow-up on regular ASEAN level and sub-regional consultations on social, habitat and fisheries issues. At least one ASEAN-wide, two sub-regional and two trans-boundary event org with partners (average 50 part) Note: focus on national and local organizations while 3.2 focus on regional and international organizations

Outcome objectives	Outputs objectives	Activity as summarized from RAF indicated areas	Key Performance Indicators (Results Assessment Framework (RAF) targets)
		<p>arrangements 3:6/3.7/3.8 Strengthen the profile and status of fisheries within the ASEAN structure. Results by the project has been made available to ASEAN and SEAFDEC bodies 3:9 The role of SEAFDEC as ASEAN's technical body has been supported, including strengthened in-house capacity</p>	
	Cross-cutting activities	<p>1.7/1,8 and 2:6/2.7 Awareness raised at (sub-) regional, provincial and local level on the need to promote diversified livelihoods and alternative income opportunities A network of institutions and individuals established with expertise in aspects related to social well-being 1.9 and 2:8 Special attention is given to gender aspects and labor issues and improved working conditions, Sub-contracts for capacity-building at local/community level incorporates gender aspects, Reviews, studies will be made as requested on social and cultural aspects</p>	<p>Awareness of the need for and challenges facing the development of alternative and diversified livelihoods for aquatic resource users in coastal and inland communities will be raised at regional, provincial and local levels together with partners in all the four target sub-regions.</p> <p>The role and position of women and youth (young people of 15 years and older) working in the fisheries sector will receive special attention. Labor issues and the need for safe working conditions will have been addressed at ASEAN and sub-regional level.</p>
	4.Project Management and Coordination	<p>Expenses of Staff, RFPN and administration, Planning meetings, regular coordination meetings (FAO/RAP/APFIC, BOBLME, ASEAN, RPOA-IUU, WorldFish Centre, MRC, CTI-CFF, and with countries of the four sub-regions) Reporting costs, editing and printing Project monitoring and coordination, project mid-term review (year 3) and project evaluation (year 5) Operating, equipments and maintenance expenses</p>	

*Note: Following the guidelines from Sida, the results of the SEAFDEC- Sweden Cooperation Project is presented in a so-called **Results Assessment Framework (RAF)** and revised in early 2016 based on request from the Swedish Embassy in Bangkok.*

4.2 Overall Scope/Description of Project

For the purpose of implementation and follow up, activities are planned under three output groups, one cross-cutting section and a section for Project management and coordination. This would also allow for the cross-referencing (*i.e.* gender, health, environment, climate change and capacity building) between output groups, when assessing the results and related outcomes. The present agreement with Sweden under the SEAFDEC-Sweden Project, covered originally the period from 2013 to 2017, however, in early 2017 it was agreed with the Embassy of Sweden to extend the project (within the same total amount of allocated funds) through an Amendment to the Agreement up until 31 December 2019.

The geographical coverage includes four sub-regions (Andaman Sea, Gulf of Thailand, Sulu-Sulawesi Seas and the Mekong). However, the main focus was in the Gulf of Thailand and Andaman Sea, as priority. Support is being provided to processes to strengthen regional cooperation on neritic tuna, management of fishing capacity, combating IUU fishing, EAFM and capacity building programs as requested by Member Countries.

In order to address the issues related to the management of important habitats for fisheries, fishing capacity and socio-cultural aspects at local level, SEAFDEC-Sweden Project will work closely with institutions and organizations that are well placed to facilitate and support provincial and district capacity-building. The strategy also involves capacity building for better management, including the capacity to engage more effectively with villagers in ASEAN-SEAFDEC Member Countries, which implies the involvement of broad stakeholder participation.

Process results and outcomes and achievements would, to a large extent be reflected in indications and reports from bodies, and individuals outside of the project, *i.e.* SEAFDEC Council, ASEAN, FAO/APFIC, RPOA-IUU, BOBLME, MRC, USAID, UNEP/GEF/Fisheries *Refugia* Project etc in recognition of steps being taken and impacts achieved.

In addition, SEAFDEC-Sweden project is continuing its support to long-term human resource development program for its Member Countries through the program of the SEAFDEC Regional Fisheries Policy Network (RFPN) that include an expanded role of assisting SEAFDEC in the development of regional priority and policy issues through their participation in the implementation of regional and sub-regional programs and follow-up on the commitment for the implementation of policies under the ASEAN framework. Among themselves, they have learned to work together as a team with a common regional perspective and they had successfully built up both strong friendship and strengthened cooperation among ASEAN Member Countries.

4.3 Activity, Sub-activity Expenses for 2013-2019

Budgets in the Table 2 shows the relative balance between Output Objectives, cross-cutting elements has been divided between the groups. The use of funds also spent for the successful link with partner organizations, such as FAO, RPOA-IUU, UNEP/GEF/Fisheries *Refugia* Project, IUCN/MFF, BOBLME, MRC, USAID, CTI-CFF etc. In 2018, the actual expenses was spent from January-31 December 2018 was 19,805,240.14 Baht (indicating that 96.70% of available funds were utilized). The total spent from 2013-2018 was 160,525,275.48 Baht.

In 2019, the Project received the budget approximately 4,000,000 SEK (equivalent to 12,800,000 Baht). With the Agreement with the Embassy of Sweden, financial report of 2019 was re-categorized into 9 heading namely: 1) Personal; 2) Travel; 3) Project Monitoring and Co-ordination; 4) Sub Contracts; 5) Trainings/Workshops; 6) Regional Consultations; 7) Equipment and maintenance; 8) Reporting cost; and 9) Overhead charge (10%). As of August 2019, the total budget was spent 5,520,658.53 Baht. The details of expenditures of the 2019 will be reported after the 31 December 2019 to the Embassy of Sweden.

Table 2: Expense based on activity and sub-activity for 2013-2018

(Unit: Baht)							
(Activity Group) Output Objective	Sub-Activity	2013 (actual expenses)	2014 (actual expenses)	2015 (actual expenses)	2016 (actual expenses)	2017 (actual expenses)	2018 (actual expenses)
Output objective 1: Capacity	Output objective 1 have 4	1,389,694.98	8,571,044.97	12,236,940.85	16,667,958.84	10,544,469.27	3,732,943.72

(Activity Group) Output Objective	Sub-Activity	2013 (actual expenses)	2014 (actual expenses)	2015 (actual expenses)	2016 (actual expenses)	2017 (actual expenses)	2018 (actual expenses)
built for integration of habitat & fisheries management and adaptation to climate change	activity “indicators” (see above) together with annual targets						
Output Objective2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)	Output objective 2 have 5 activity “indicators” (see above) together with annual targets	142,247.00	3,286,701.00	3,954,403.16	4,727,945.38	7,049,869.82	1,952,093.36
Output Objective3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements	Output objective 3 have 6 activity “indicators” (see above) together with annual targets	1,495,821.32	4,006,832.78	1,924,153.05	5,590,128.06	3,999,993.34	5,041,510.11
Cross-cutting issues – see above on RAF structure	In this table the activities included under 1, 2 and 3 above						
4. Administration, personnel and coordination	1. Expenses of Staff, RFPN and administration 2. Planning meetings, regular coordination meetings (FAO/RA)	12,907,594.53	14,422,775.56	8,528,853.09	7,681,277.11	9,019,017.95	7,278,216.57

(Activity Group) Output Objective	Sub-Activity	2013 (actual expenses)	2014 (actual expenses)	2015 (actual expenses)	2016 (actual expenses)	2017 (actual expenses)	2018 (actual expenses)
	P/APFIC, BOBLME, ASEAN, RPOA-IUU, WorldFish Centre, MRC, CTI-CFF, and with countries of the four sub-regions)						
	3. Reporting costs, editing and printing						
	4. Project monitoring and coordination						
	Sub-Total (THB)	10,146,556.76	23,696,876.08	26,644,350.15	34,667,309.39	30,613,350.04	18,004,763.76
	Overhead charge	3,389,404.32	2,369,687.60	2,664,435.02	3,466,730.94	3,061,335.04	1,800,476.38

Remark: Overhead charge based on actual expenses of each year.

PART II: ACHIEVEMENTS OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for 2019

The SEAFDEC-Sweden Project has successfully continued to facilitate consultations between ASEAN Member States at regional, sub-regional and sub-sub-regional levels. In 2019, the Project conducted 9 events, focused on remaining activities main thematic areas and cross-cutting issues: Neritic Tuna; transboundary species, fishing Capacity (MCS-network building); gender; small-scale fisheries and wrap-up events with local partners. Specific sub-regional focus is given to strengthened cooperation around Gulf of Thailand, Andaman Sea.

In 2019, the Project implemented the remaining activities and prepared for the phasing out of the Project. The achievement of the 2019 is described as per output objectives of the Project as follows:

Output objective1: Capacity built for integration of habitat & fisheries management and adaptation to climate change

- **Sustainability of Transboundary species through the Implementation of the Regional Plan of Action (RPOA)-Neritic Tuna in Southeast Asia Waters (ASEAN Wide)**

Upon the endorsement of the **RPOA-Neritic Tunas** by ASEAN in 2015, it is gradually implemented by ASEAN Member States and continued with the gathering of information on stock status and migration patterns for Neritic Tuna species like longtail tuna, kawakawa and the other neritic Tuna-like species (Spanish and king mackerels). The progress was updated during the 5th Scientific Working Group on Neritic Tunas conducted in 9-11 January 2019 in Bangkok, Thailand. The Meeting was reported the results of the Indo-Pacific King mackerels and Narrow-barred Spanish mackerel stock and risk assessment and results of the genetic study of Longtail tuna for Southeast Asian waters. Subsequently, reported at the 51st Meeting of the SEAFDEC Council

(51CM) in March 2019, in Indonesia and 27th Meeting of ASWGF on 27-29 June 2019, in Da Nang, Viet Nam, respectively. While noting that the recommendations to reduce the catch of narrow-barred Spanish mackerel and increase the catch of Indo-Pacific king mackerel in Pacific and Indian Oceans, the 51CM suggested that specific working group should be established to consider the results and conclusion of the stock and risks assessments of these two species in order to come up with appropriate management recommendations. The 51CM also suggested that the activities of the SWG-Neritic Tunas should also focus on stock assessment of target neritic tuna species in order to come up with practical and effective management measures that would ensure the sustainable utilization of the species.

The 51CM encouraged that the results of the stock and risk assessments of neritic tunas undertaken by the SWG-Neritic Tunas should be shared with concerned RFMOs, e.g. IOTC, for appropriate action.

The work initiated under the RPOA-Neritic Tunas and Scientific Working Group on Neritic Tunas will be continued beyond 2019 by the SEAFDEC/MFRDMD (through Japanese Trust Fund) and under the ASEAN framework in cooperation with the ASEAN Working Group on Tuna and others.

- **Management of trans-boundary resources/stocks**

Gulf of Thailand sub-region

The conduct of tissue sampling of Indo-Pacific mackerel (*Rastrelliger brachysoma*) was conducted in Cambodia, Malaysia, Thailand and Viet Nam during 2018 and DNA was analyzed by Kasetsart University of Thailand, subsequently the SEAFDEC-Sweden Project conducted the Gulf of Thailand Technical Meeting on Management of Transboundary Species: Indo-Pacific mackerel which was convened on 19-20 December 2018 in Bangkok, Thailand, to revealed the results of the stock structure of Indo-Pacific mackerel (*Rastrelliger brachysoma*) for the GOT sub-region. The Meeting recommended to develop the sub-regional transboundary species management plan for national level and sub-regional level in order to confirm the proceeding of the future cooperation management in the GOT Sub-region.

Therefore, the SEAFDEC-Sweden Project in collaboration with SEAFDEC/UNEP/GEF Fisheries *Refugia* Project successfully co-organized the Technical Consultative Meeting on Drafting of the Regional Action Plan for Management of Transboundary Species: Indo-Pacific mackerel (*Rastrelliger brachysoma*), in the Gulf of Thailand Sub-region on 12-13 September 2019 in Chonburi, Thailand. The Meeting was able to draft “the Regional Action Plan for Management of Transboundary Species: Indo-Pacific mackerel, in the Gulf of Thailand Sub-region” which comprises five (5) dimensions included i) ecosystem, ii) social iii) economic, iv) governance and v) climate change with the Goal is “the Sustainable Indo-pacific mackerel fisheries in the Gulf of Thailand sub-region through holistic management approach by 2030” as well as the Objectives and expected Outcomes. It is expected the results would be presented at the high level for their consideration.

Output Objective2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)

- **ASEAN RPOA-Fishing Capacity (monitoring and control and combating illegal fishing) and effort to combat IUU Fishing (June)**

The RPOA- Fishing Capacity contains a set of key priorities to improve the management of fishing capacity, measures to control fishing effort based on catch documentation, Port State Measures, labor and working conditions, and strengthening Monitoring, Control and Surveillance networks in the region and sub-regions. The focus of activities in 2019 was continued on the development and implementation of sub-regional and bi/trilateral MCS networks in the Gulf of Thailand and Andaman Sea region. During the year, the efforts on the establishment of MCS Networks have been shared with national and regional partners such as ASEAN, RPOA-IUU, International Monitoring, Control and Surveillance (IMCS), FAO/GEF7 (new project proposal), SEAFDEC/Japanese Trust Fund, Sustainable Management of Highly Migratory Fish Stocks in the West Pacific and East Asian Seas under WCPFC (WPEA-SM Project).

- **Support on the Establishment of Monitoring, Control and Surveillance (MCS) Networks**

In 2017, the SEAFDEC-Sweden Project facilitated the Sub-regional Consultation on the Development of MCS in the Gulf of Thailand on 31 October-2 November 2017. Based on the discussion, SEAFDEC drafted the Road Map to establish the MCS Networks and nomination of National Technical Group (NTG) for MCS, to discuss

on procedures to support the establishment of sub-regional MCS body, which include: 1) national-level consultation(s); 2) sub-regional meeting(s); and 3) establishment of the sub-regional MCS network.

Gulf of Thailand sub-region

In order to follow up the action, the SEAFDEC-Sweden Project organized the Gulf of Thailand Sub-Regional Monitoring, Control and Surveillance (MCS) Network Meeting on 20-21 June 2019, in Chonburi Province, Thailand. The Meeting was attended by the country delegates from Cambodia, Malaysia, Thailand and Viet Nam, who are officials from various agencies involved on each component of Monitoring, Control and Surveillance, representing as National Technical Group (NTG) for MCS. The Meeting came up with the list of information to be share among the GOT countries. The Meeting discussed particular on working mechanisms and ambitions for Future MCS Coordination Group in the Concept Paper, which was drafted by the SEAFDEC-Sweden Project for revision and confirmation. The major outputs are included i) countries updated progress on strengthening sub-regional cooperation on MCS network establishment, ii) countries agreed on the revision of the concept of working mechanisms and future MCS network coordination, and iii) countries agreed on the establishment of single point of contact (SPOC) for GOT countries by using the same RPOA-IUU focal point network for the time being

Furthermore, the Meeting agreed to utilize SEAFDEC and ASEAN mechanism for strengthening MCS Network by i) reporting the progress made on MCS Network establishment to the Program Committee Meeting (PCM) in 2019 for approval, and ii) reporting and submitting the concept paper on the working mechanisms and future MCS coordination to ASEAN Fisheries Consultative Forum (AFCF) and ASEAN mechanism as appropriate.

Andaman Sea sub-region

The SEAFDEC-Sweden Project organized the “Meeting on Development of Monitoring, Control and Surveillance Network for Southern Andaman Sea Sub-region” on 20-21 August 2019 in Thailand, with officers from relevant agencies of Indonesia, Malaysia and Thailand in attendance such as various fisheries, enforcement authorities and maritime security. The Meeting was conducted as follow-up of the suggestion from the Third Sub-regional Consultative Workshop of the Joint Fisheries Management around the Southern Andaman Sea in November 2017 and the “4th Meeting of Andaman Sea Sub-region” in 2018. During the Meeting, countries shared ideas on common priority areas for data sharing and coordination in relation to MCS around the Southern Andaman Sea, discussed on ways forward on strengthening MCS network, and suggested communication mechanism for information exchange (*e.g.* concentrate on enhancing the regional cooperation in combating IUU fishing, preventing of network duplication, not legally binding to prevent complication during operation, conduct MCS Southern Andaman Sea meeting simultaneously with other regional meetings) in connection with the existing cooperation initiatives in the Southern Andaman Sea Sub-region.

Output Objective 3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements

- **Strengthening the sub-regional cooperation in target sub-regions – Gulf of Thailand, Andaman Sea, Mekong and the Sulu-Sulawesi Seas**

Discussions on transboundary and sub-regional cooperation in fisheries and habitat management, including measures to monitor and control fishing efforts and landings across borders, had been facilitated by the previous phase of the SEAFDEC-Sweden Project. This phase continued the process from 2013. The activities for the Gulf of Thailand and Andaman Sea Sub-regions were directly implemented through the SEAFDEC-Sweden Project. For the Mekong River Basin and the Sulu-Sulawesi Seas Sub-regions, initiatives were carried out by the partners in these areas: the Mekong River Commission (MRC) in the Mekong Basin and the USAID-Oceans and Fisheries Partnership (USAID-Oceans), and the Coral Triangle Initiatives on Coral Reefs, Fisheries and Food Security (CTI-CFF) in the Sulu- Sulawesi seas.

Gulf of Thailand Sub-region

The 8th Meeting of the Gulf of Thailand Sub-Region (8GOT) took place from 4 to 5 September 2019 in Chonburi, Thailand, with financial support from the SEAFDEC-Sweden Project. The Meeting aims to (i) review the recommendations from previous SEAFDEC-Sweden Project related meetings and report on progress, (ii) review steps taken to strengthen cooperation on transboundary fisheries and habitat management options including potential actions for continuing operations at the sub-regional level, (iii) strengthen sub-regional MCS Network cooperation, and (iv) recommend further actions for the GOT Sub-region Meeting platform.

As recognition that the Gulf of Thailand Sub-region cooperation, supported by SEAFDEC which was started since the 1st Meeting of the Gulf of Thailand sub-region in 2009. The SEAFDEC-Sweden project (Phase 2013-2019) have been supported the GOT Sub-regional Meeting since the 4th until the 8th Meeting of GOT in 2019. The results from the Meeting reported to the RPOA-IUU committee meeting annually.

Hence, the at the 8GOT Meeting, countries affirm the importance of GOT sub-regional platform, and expressed the willing to continue this such mechanism in the Gulf of Thailand sub-region after the completion of SEAFDEC-Sweden project.

Andaman Sea Sub-region

The Project convened the “4th Meeting of the Andaman Sea Sub-region” on 20-21 November 2018 in Thailand”. The project successfully facilitated the discussion on several of mutual interest, including the aspect on management of transboundary stocks, combating IUU fishing and the establishment of MCS coordination effort for Northern and Southern Andaman Sea sub-regions. In 2019, for the Andaman Sea sub-region, the Project provided the information and key achievements derived from the SEAFDEC-Sweden Project to the formulations of the Strategy Action Plan (SAP) of FAO/Bay of Bengal Large Marine Ecosystem (Phase II).

- **Gender and Social Development**

In 2019, the Project continued to work on the integration of gender in project implementation, provision of institutional capacity building at SEAFDEC, and enhancing the cooperation with other partners toward the promotion of gender equality in the fisheries sector.

The collaboration with IUCN/SEI/SEAFDEC-Sweden on Regional Gender Study, in collaboration with Mangrove for the Future and SEI at site levels

After the completion of the *Regional Gender Study* which was commenced in 2017 as a joint effort of the Mangroves for the Future (MFF), Stockholm Environment Institute (SEI), and SEAFDEC-Sweden Project was successfully completed in 2018. Results of the study were presented during the “Regional Dialogue on Gender Dimension in Coastal and Fisheries Resources Management in South Asia and Southeast Asia: Opportunities and Challenges” on 15-16 November 2018 in Bangkok, Thailand. While the Study has deepened the understanding on the gender dimension in coastal and fisheries resources management, during the Regional Dialogue, discussion was also made on how structural challenges are preventing the equitable opportunities for men and women in South Asia and Southeast Asia. In celebration of International Women’s Day (8 March 2019), Southeast Asian Fisheries Development Center (SEAFDEC), in collaboration with Mangroves for the Future (MFF) and Stockholm Environment Institute (SEI), launched a Gender Synthesis Review and Gender Analysis Toolkit (GAT), to improve gender integration and mainstreaming in coastal resource management programs in South and Southeast Asia. The toolkit aims to help coastal and fisheries management practitioners, such as program officers and technical advisors from development and environmental agencies, develop baseline knowledge around gender dimensions related to coastal and natural resources use, livelihoods development and ecosystems management. The study, along with a resulting synthesis report contributes to strengthening our collective understanding and commitment towards achieving gender equality as a core part of coastal and marine resource management and the Sustainable Development Goals (SDGs), in particular SDG 5 and SDG 14.

Finalization of the Practical Guide for Gender Analysis in Small-Scale Fisheries and Aquaculture in Southeast Asia

The draft “Practical Guide” was firstly developed during the “Experts Consultation Workshop on Guidance to Monitoring and Evaluation of Gender Equity and Social Well-being in Fisheries Communities” on 8-10 August

2018 in Bangkok, Thailand by using the key components of the “FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines)” as framework, key indicators and guide questions were identified, and once this is developed, such toolkit could be used to support the monitoring and evaluation of gender equity and social well-being in fisheries communities. To finalize the draft, the Experts Consultation Workshop on Finalization of the Practical Guide for Gender Analysis in Small-Scale Fisheries and Aquaculture in Southeast Asia was convened from 10 to 11 July 2019 at SEAFDEC Training Department, Samut Prakan, Thailand. It expected that this Practical Guide for Gender Analysis would be use a tool to support the AMSs in integrating gender and social well-being in the entire cycle of their respective programs and projects to obtain sustainable fishery resources and eradicate poverty in small-scale fishing communities.

SEAFDEC Gender Strategy

In order to sustain the initiatives and to further integrate the gender concept at the organizational level, the SEAFDEC Secretariat proposed during the 50th Meeting of the SEAFDEC Council on 26-30 March 2018, in Siem Reap, Cambodia the development of “*SEAFDEC Gender Strategy.*”, which would provide an overarching framework to facilitate SEAFDEC’s efforts toward integrating gender in its future programs and projects, which would eventually support the integration of gender perspectives in fisheries in the respective countries.

Upon the approval by 51st Meeting of the SEAFDEC Council in 2019, the SEAFDEC-Sweden Project organized The Workshop on the Development of the Action Plan for SEAFDEC Gender Strategy was convened from 9 July 2019, with participation of SEAFDEC Gender Focal Persons from the Secretariat, TD, AQD, MFRDMD and IFRDMD. Based on the discussion, the Workshop was agreed on the common action plan and common key indicators in order to monitor and evaluate the implementation of SEAFDEC Gender Strategy and mechanism of reporting. The reporting of progress will be at the end of January every year in order to consolidate into Annual Report.

- **Enhancing Coordination within ASEAN Countries through the Regional Fisheries Policy Network (RFPN)**

Under the present arrangements, in 2019, the SEAFDEC-Sweden Project supported four (4) officers from national fisheries agencies namely: Indonesia, Myanmar, Thailand and Philippines, while two (2) officers were supported by the Japanese Trust Fund (JTF) namely: Cambodia, Lao PDR and Viet Nam. On an annual basis, staffs from fisheries agencies of ASEAN Member Countries are posted at the SEAFDEC Secretariat for a year. RFPN members plays an active role in enhancing coordination and communication between SEAFDEC and their respective countries while also being given the opportunity to attend and provide technical contributions in various events organized by SEAFDEC.

- **Coordination with other organizations and projects**

The project supported joint activities and coordination with ASEAN, SEAFDEC and several other international and regional organizations with an aim to increase regional cooperation and to ensure the long-term sustainability of marine and inland aquatic resources. Regional cooperation is required to build-up and to promote a common understanding through joint regional, sub-regional and bilateral approaches – to secure sustainability bearing in mind the “transboundary” nature of many of the fisheries resources including the mobility of fishermen who pursue them. The Project facilitated sub-regional initiatives during regional consultations and sub-regional events (Gulf of Thailand and Andaman Sea) as well as in the development of Regional Plans of Action, such as the RPOA-IUU, the RPOA-Neritic Tuna and the RPOA-Fishing Capacity.

During the year, the project closely coordinated with FAO Head Quarter in Rome and FAO Regional Office in Bangkok/APFIC; the Secretariat of Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing (RPOA-IUU); Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security (CTI-CFF). The Project also shared information with several organizations and projects such as SwAM, USAID/Oceans, International Labour Organization (ILO), SEAFDEC/UNEP/GEF/Fisheries *Refugia* Project, SEAFDEC/Japanese Trust Fund (JTF).

Support to local capacity-building

National forum to share lessons learned and knowledge of fisheries communities on fisheries resources and habitat management on 6-8 August 2019 at Chanthaburi and Trat province.

The SEAFDEC-Sweden Project in collaboration with the Sustainable Development Foundation (SDF) of Thailand carried out activities related to Ecosystem-based Approach to Fisheries Management (EAFM) in Trat province from July 2016 to June 2018, under the titled ‘Towards an Ecosystem-based Approach to Fisheries Management in Trat Bay’. The activities focused on strengthening and building the capacity of the communities on the development of local organizations, habitat restoration, and improved awareness of the benefits of local knowledge and addressing gender and climate change adaptation and relevant sustainable development goals.

As the project have been completed implementation, the SEAFDEC-Sweden Project in collaboration with SDF and Burapha University, Chanthaburi Campus co-organized a National Forum in order to disseminate experiences and lessons learned from local implementation to relevant organizations/sector and youth (new generation), raise awareness on coastal communities livelihood and fisheries and coastal ecosystem. Furthermore, to enhance relationship among government, organization, academic institute and communities as well as across between Thailand and Cambodia. Approximately 120 participants from various organizations, communities, include youth and researchers from universities included 10 participants from Cambodia.

The major sessions included the topic of fisheries and habitat management approach and small scale fisheries of Trat Bay, climate change mitigation, local network on fisheries and habitat management, gender in fisheries and research for communities as well as sharing experience from Learning Institute and CORIN-Asia Cambodia. In addition, for the technical visited at Trat province, also highlighted on the solid waste management in the coastal communities and resources enhancement (crab bank and FAD) which are the common concern topics in both Cambodia and Thailand.

2. Information of 2019 Activities including Involved Stakeholders

Table 3: Summary major list of events conducted including involved stakeholders and budget spent

List of Actual Sub-activity (1)	Type of activity*	Number of Participants			Total Budget Spent (Baht)
		MCs	SEAFDEC+ RFPN	Others organizations	
Output objective 1: Capacity built for integration of habitat & fisheries management and adaptation to climate change					
5 th Meeting of Scientific Working Group (SWG-Neritic Tunas), 9-11 January 2019, Bangkok, Thailand	P	7(F2M5)	17(F7M10)	(3F1M2)	385,137.44
Technical Consultative Meeting on Drafting of the Regional Action Plan for Management of Transboundary Species: Indo-Pacific Mackerel in the Gulf of Thailand Sub-region, 12-13 September 2019, Thailand	P	18(F6M12)	19(F10M9)	2(F0M2)	Being finalized
Output objective 2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)					
The Gulf of Thailand Sub-regional Monitoring, Control and Surveillance (MCS) Network Meeting 20-21 June 2019, Chonburi Province, Thailand	P	19(F3M16)	12 (F5M7)	1(F1)	510,579.35
The Meeting on the Development of Monitoring, Control and Surveillance Network for Southern Andaman Sea, 20-21 August 2019, Bangkok, Thailand	P	14(F4M10)	17(F7M10)	2(M2)	102,443.36

List of Actual Sub-activity (1)	Type of activity*	Number of Participants			Total Budget Spent (Baht)
		MCs	SEAFDEC+ RFPN	Others organizations	
Output objective 3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements					
The 8 th Meeting of the Gulf of Thailand Sub-Region, 4-5 September 2019, Thailand	P	8 (F7M8)	13(F5M8)	2(F1M1)	Being finalized
Workshop on the Development of the Action Plan for SEAFDEC Gender Strategy, 9 July 2019	P		29(F20M9)		172,387.12
Experts Consultation Workshop on Finalization of the Practical Guide for Gender Analysis in Small-scale Fisheries and Aquaculture in Southeast Asia, 10-11 July 2019, SEAFDEC/TD	P	10(F7M3)	23(F17M6)	7(F7M0)	201,992.63
National Forum on Sharing Lessons learned and Knowledge on habitat and fisheries management (implemented by SDF) in Thailand, 6-8 August 2019, Chanthaburi, Thailand	P	(61F28M43)	8(M5M3)		540,715.20
The End of the Project Meeting, 30-31 October 2019, Bangkok, Thailand	P				To be reported later
Activity: Participation in the non-SEAFDEC-Sweden events and policy forum					
The FAO Workshop on GOTFish: Promoting Sustainable Use of the Gulf of Thailand Fisheries Resources through the Blue Economy and EAFM, 14-15 March 2019, Bangkok	O		2		
The 51 st Meeting of the SEAFDEC Council, 18-22 March 2019, Surabaya, Indonesia	O		1		
The Embassy of Sweden's Annual Workshop "Empowering people for Sustainable Future, 25-26 March 2019, Bangkok	O		1		
The 7 th MRC Regional Stakeholder Forum: Mekong Transboundary Integrated Water Resources Management, 20 May 2019, Bangkok	O		4		
The 2 nd Regional Scientific and Technical Committee Meeting of SEAFDEC/UNEP/GEF/Fisheries <i>Refugia</i> Project in the south China Sea and Gulf of Thailand, 21-23 May 2019, Kapot, Cambodia	O		1		
The 11 th Meeting of the ASEAN Fisheries Consultative Forum (AFCF), 25-26 June 2019, Da Nang, Viet Nam	O		1		
Regional GEF PIF Validation Workshop on "GoTFish: Promoting the Blue Economy of the Gulf of	O		2		

List of Actual Sub-activity (1)	Type of activity*	Number of Participants			Total Budget Spent (Baht)
		MCs	SEAFDEC+ RFPN	Others organizations	
Thailand through the Ecosystem Approach to Fisheries”, 1-2 August 2019. Bangkok, Thailand					

*There are 5 types of activity (R, T, I, P, and O) as follows;

- I. **Research and Development activities:** Conduct of technical/scientific research, fact-finding activities, Generation/verification of technologies that could be used by target users (*e.g.* fishers, farmers, processors).
- II. **Training activities:**
- III. **Information activities:** activities that aim to enhance collection of fisheries data and information, and improve visibility of SEAFDEC (*e.g.* production of publications, tool kits, SOP, information materials, conduct of exhibitions, etc.)
- IV. **Policy development activities:** Activities that aim to develop fisheries policies, *e.g.* expert consultation, regional consultations, development of regional guidelines, policy frameworks, etc., including desk studies on policy issues

V. Collaborative Program for SEAFDEC Research Vessels

- VI. **Others:** Activities related to project administration; communication; project planning, monitoring and evaluation (including project review meeting); staff capacity building, including participation of project staff to non-SEAFDEC events, etc.

(Some activities may fall into more than one category, but Departments should specify which category the activity would fit best).

PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

1. Summary of Achievements in the Overall Project Duration

From 2013-2019, the “SEAFDEC-Sweden Project” supported to ASEAN Member States (AMSs) in the implementation of regional actions with the Outcome Objective toward “Sustainable use of aquatic resources and reduced vulnerability to climate change by coastal/rural (fishing) communities in the ASEAN region.”, The Project specifically aimed at strengthening capacity among the AMSs on management of fisheries and habitats, management of fishing capacity and combating IUU fishing through regional and sub-regional cooperation and on-site cooperation with regional and national partners for a broader coverage. The Project’s geographical focus areas are on four sub-regions (Andaman Sea, Gulf of Thailand, Mekong River Basin and Sulu Sulawesi Seas). However, the main focus areas are the Gulf of Thailand and Andaman Sea Sub-regions.

Output Objective 1: integration of habitat & fisheries management

On the management of fisheries and their habitats, the Project supported the Member Countries by focusing on stock studies of transboundary species in different areas, namely: Southeast Asian waters, Gulf of Thailand and Andaman Sea. The species are Neritic Tunas, Indo-Pacific Mackerels, Anchovies and Blue Swimming Crab. The Project also built capacity on the Ecosystem Approach to Fisheries Management towards improved management of fisheries and habitat integration.

i. Sustainability of Transboundary Species through the Implementation of the Regional Plan of Action on Sustainable Utilization of Neritic Tunas in the ASEAN Region (RPOA-Neritic Tunas)

The significant results of the implementation of the ASEAN Regional Plan of Action (RPOA)-Neritic Tuna, and the studies of stock assessment of Neritic Tunas (*e.g.* longtail tuna (*Thunnus tonggol*), Kawakawa (*Euthynnus affinis*), Indo-Pacific King Mackerel (*Scomberomorus guttatus*) and Narrow-barred Spanish Mackerel (*Scomberomorus commerson*)), undertaken by the Scientific Working Group on Neritic Tunas. As well, the Genetic Study of Longtail tuna (*Thunnus Tonggol*) in Southeast Asian waters covering the South China Sea, Gulf of Thailand and Andaman Sea. The study was carried out by SEAFDEC/MFRDMD from 2017-2018. The progress and results were regularly reported to the annual meeting of the SEAFDEC Council and the ASEAN mechanism.

ii. Management of Transboundary Resources/Stocks through Sub-regional Approach

Gulf of Thailand Sub-region (Cambodia, Thailand, Malaysia and Viet Nam)

The Project also supported the transboundary species management of Indo-Pacific mackerels, Anchovies and Blue Swimming Crab for Gulf of Thailand sub-region. The Project supported the capacity building on the data collections for researchers and delivered the Standard Operating Procedures (SOP) for data collection of transboundary species. Based on the recommendation from the consultations, advised for identify additional information needed to provide a sufficiently reliable basis for the formulation of joint management plans for the target species (anchovies, Indo-Pacific mackerel and blue swimming crab or AIB species) in the Gulf of Thailand. In 2018, the Project supported DNA collection and analysis for Indo-Pacific mackerel to better understand its stock status in Cambodia, Viet Nam, Thailand, and Malaysia. The results of the DNA analysis were revealed on the mixed stock structure of the Indo-Pacific Mackerel in the Gulf of Thailand sub-region. The SEAFDEC-Sweden Project in collaboration with the UNEP/GEF/Fisheries *Refugia* Project successfully jointly drafted “the Regional Action Plan for Management of Transboundary Species: Indo-Pacific mackerel, in the Gulf of Thailand Sub-region”, which would be use as basis for further continue the study and collaboration among the countries.

Andaman Sea Sub-region (Myanmar, Thailand, Malaysia and Indonesia)

SEAFDEC continued to address the need to improve knowledge and management approaches for mackerels and neritic tuna and monitoring of important habitats as a basis for continued activities. In 2017, the Third Sub-regional Consultative Workshop of the Northern Andaman Sea/Myeik Archipelago (held in Bangkok on 16-17 Nov 2017), and the Southern Andaman Sea Sub-regional Technical Meeting on Effective Fisheries Management (also in Bangkok on 21-22 Nov 2017) agreed on a plan of work for the development of joint management plans for transboundary stocks such as the Indo-Pacific mackerel.

The Project organized two meetings for Northern Andaman Sea (Thailand and Myanmar) and two meetings for Southern Andaman Sea (Thailand, Indonesia and Malaysia) in 2018 to identify and review the available data from the concerned countries on the priority species, *i.e.* anchovies, mackerels and neritic tunas. The information on digital maps indicating the spawning grounds, spawning seasons, biological characteristics, habitats and migration patterns, as well as existing fishing regulations on these species were reviewed. Gaps in the data and information were identified. These will need to be filled so that the status of these species can be confirmed and the agreement for their appropriate management finalized. It was therefore agreed that data collection by the respective countries should continue and the quality of data improved.

iii. Raising Awareness and Capacity Building on Habitats and Fishery Resources Management

The Project placed high importance on capacity building for fisheries and habitat management. Based on the series of regional consultations, sub-regional meetings, and bilateral meetings, countries identified the areas for capacity building to improve knowledge and skills in fisheries resources management. In response, the Project in collaboration with TD and MFRDMD organized these training courses during the project period:

Some 200 officers attended the on-site training programs on Ecosystem Approach to Fisheries Management (E-EAFM) and Training of Trainers on E-EAFM. The participants, in separate courses conducted for each country, were fisheries officers of Cambodia, Myanmar, Thailand and Lao PDR. During the course of the Project, several events were conducted with local partners and communities to promote habitat restoration and fishery resources enhancement to increased awareness and appreciation of the importance of sustainable management practices and judicious utilization of fishery resources to ensure the security and sustainability of their livelihoods.

Output Objective 2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)

For the management of fishing capacity and combating IUU fishing, the project supported the AMSs on implementation of the RPOA-IUU, RPOA-Capacity, and facilitation of discussions among AMSs to develop and agree on solutions for overcapacity and IUU fishing through sub-regional and bilateral dialogues. Key aspects as follows:

iv. Strengthening the Regional Cooperation on Management of Fishing Capacity

In 2015, the SEAFDEC-Sweden Project in partnership with the Japanese Trust Fund supported the ASEAN Member States in the development of the Regional Plan of Action on Management of Fishing Capacity (RPOA-Capacity). Through its Department of Fisheries, Malaysia served as the lead country for the cluster “Promoting Sustainable Fisheries Practices: Fishing Capacity and Responsible Fisheries Practices”. Following consultations

with ASEAN Member States, the RPOA-Capacity was approved by the SEAFDEC Council at its 48th Meeting in April 2016. It was then endorsed by ASWGFi in June 2016.

v. Enhancing traceability of fishery products through the application of Electronic ASEAN Catch Documentation Scheme (eACDS)

The Project and the Japanese Trust Fund provided funding support to SEAFDEC to develop the electronic ASEAN Catch Documentation Scheme (eACDS), which is one of the regional initiatives of SEAFDEC and AMSs; it aims to improve the traceability for marine capture fisheries and to prevent the entry of fish and fishery products from IUU (illegal, unreported, and unregulated) fishing into the supply chain. The eACDS was launched at the 49th Meeting of the SEAFDEC Council in 2017 in Brunei Darussalam. The eACDS is a web-based application.

vi. Supporting the coordinated efforts to combat Illegal, Unreported and Unregulated (IUU) fishing through the implementation of the Port State Measures (PSM)

The ASEAN-wide perspective to support coordinated efforts to combat Illegal, Unreported and Unregulated (IUU) fishing relate to the implementation of the Port State Measures. The Project and the Japanese Trust Fund (JTF) together with FAO and other partners organized two events in 2016 to discuss the provisions of the PSMA, and the implications to the region of implementing the PSM.

The Expert Meeting on Port State Measures Agreement held in Bangkok 2-4 February 2016 provided a systematic review of some of the key provisions and Annexes of the PSMA and possible actions that ASEAN Member States need to implement. Training needs (especially for port inspectors) were also identified. It was emphasized that good quality catch documents (see above ACDS) with reliable traceability systems in place is critical to the verification of the legal status of the catch. The experts stressed the importance of building up capacity and structures (*i.e.* designated ports) to implement the PSMA.

vii. Strengthening the establishment of Monitoring, Control and Surveillance (MCS) Networks

One of the elements in the RPOA-Capacity is strengthening the Monitoring, Control and Surveillance (MCS) Networks at the Sub-regional level. MCS networks would provide the opportunity for the countries to share information to help improve transboundary fisheries management and control of fishing efforts and surveillance in the sub-region. The Project focused to strengthen the inter-agencies coordination for the Gulf of Thailand and the Andaman Sea that should builds on the national bodies that have been established in support of monitoring and control of fishing activities and the combating of illegal fishing.

The project succeed to invite the officers to joint work as national technical groups for MCS (*i.e.* port authorities, fisheries, customs and trade, enforcement authorities, immigration) to discuss the common concerns and critical issues that cooperation would facilitate in, including the need for information sharing as a basis for establishing an MCS networks each Gulf of Thailand sub-region, Northern Andaman Sea and Southern Andaman Sea sub-region. The countries showed the interest of countries in the region to engage in non-legally binding transboundary and sub-regional cooperation and agreed on information-sharing together with multi-institutional and multi-lateral management approaches on a sub-regional and bilateral basis are needed to facilitate the management of fishing activities and to combat IUU fishing.

Output Objective 3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements

Several activities implemented at regional, sub-regional and bilateral levels produced outputs that have increased the capacity of key stakeholders to develop national policies and processes that are suitable for framing regional and sub-regional agreements and for drawing up and implementing action plans.

viii. Strengthening Sub-regional Cooperation in Target Sub-regions

Discussions on transboundary and sub-regional cooperation in fisheries and habitat management, including measures to monitor and control fishing efforts and landings across borders, had been facilitated by the previous phase of the SEAFDEC-Sweden Project. This phase continued the process from 2013. The activities for the Gulf of Thailand and Andaman Sea Sub-regions were directly implemented through the SEAFDEC-Sweden Project. For the Mekong River Basin and the Sulu-Sulawesi Seas Sub-regions, initiatives were carried out by the partners in these areas: the Mekong River Commission (MRC) in the Mekong Basin and the USAID-Oceans and Fisheries Partnership (USAID-Oceans), and the Coral Triangle Initiatives on Coral Reefs, Fisheries and Food Security (CTI-CFF) in the Sulu- Sulawesi seas.

As the bilateral dialogues had strengthened the cooperation between the countries in different sub-regions, MOUs had been signed between countries such as those between Thailand-Cambodia, Thailand-Lao PDR, and Thailand and Myanmar.

- ***Gulf of Thailand Sub-region:***

The SEAFDEC-Sweden Project provided continued the GOT Sub-regional platform since 2008 and until 8th Meeting of the Gulf of Thailand Sub-region which the last meeting with support of the Project in September 2019. As part of the Gulf of Thailand Sub-regional cooperation, the Project also facilitated bilateral dialogues which enabled each country to understand to other's national laws and regulation, strategies and actions to manage fishing capacity, and the issues that each country is facing (and how it is resolving those issues) to reduce IUU fishing.

These are the Bilateral Dialogues facilitated by the Project:

- Thailand-Malaysia (14-15 May 2014 and July 2017)
- Cambodia-Viet Nam (5-7 March 2014 and 6-7 October 2014)
- Cambodia and Thailand (January 2015 and August 2018)
- Thailand-Viet Nam (June 2018)

Several activities have been organized and a number of outputs delivered since 2014:

- a series of workshops to develop standard operating procedures (SOP) for data collection on transboundary species including training for enumerators for Cambodia, Thailand and Viet Nam
- Training of the Trainers on Hatchery of Blue Swimming Crab (for Cambodian officers)
- Comparative reviews national laws and regulations (Cambodia and Viet Nam)
- Study on the Strengthening of Malaysia and Thai Partnerships in support of Joint Fisheries Planning and Management in the Western Gulf of Thailand
- Study on existing mechanisms/bilateral arrangements between Koh Kong (Cambodia) and Trat (Thailand) in order to trace any existing arrangements that have been established previously.

- ***Andaman Sea Sub-region***

The previous phase of the SEAFDEC-Sweden Project organized in 2009 the First Meeting of the Andaman Sea Sub-region, in collaboration with the BOBLME Project. The current Project continued to strengthen the sub-regional cooperation among Thailand, Myanmar, Indonesia and Malaysia. In the Northern Andaman Sea (between Myanmar and Thailand) and Southern Andaman Sea (among Thailand-Malaysia and Indonesia)

- A sub-regional consultative meeting was organized on 27-28 May 2014 in Phuket, Thailand to facilitate the Thailand-Myanmar sub-regional cooperation for fisheries management around the North Andaman Sea/Myeik Archipelago.
- The 3rd Meeting of the Andaman Sea sub-region was organized on 18-20 October 2016 in Bangkok.
- The 3rd Sub-regional Consultative Workshop of the Northern Andaman Sea/Myeik Archipelago was held in November 2017
- The Sub-regional Consultative Workshop of the Southern Andaman Sea was held in November 2017
- The 4th Meeting of the Andaman Sea sub-region was organized in 2018

A concrete expression of cooperation between Thailand and Myanmar is the signed MOU between two countries. Thailand and Myanmar have made progress during 2017 in several areas of mutual interest including the management of transboundary stocks and combating IUU fishing.

The bilateral consultation between Myanmar and Thailand and the trilateral consultation among Indonesia-Malaysia-Thailand were organized to resume transboundary dialogues and discuss joint approaches for information sharing in support of the management of transboundary fish stocks, management of fishing capacity, monitoring of landings, and dealing with IUU fishing, and establishing MCS networks. The progress of this has been described in more detail above (Output objective 1: transboundary fish stocks and Output objective 2: fishing capacity and MCS)

- ***Mekong River Basin Sub-region***

Coordination with Mekong River Commission (MRC)

The project had been in regular contact with the MRC Fisheries Program since 2013 to obtain updates on the development of the Mekong Basin Wide Fisheries Strategy and the plans to terminate the MRC Fisheries Program. The SEAFDEC-Sweden Project in collaboration with MRC organized in 2014 the Experts Meeting on Mekong Cooperation on Fisheries, Aquatic Resources and Wetlands: 20 Year Lessons Learnt.

In anticipation of the changes to fisheries management and the implementation of Mekong Basin Wide Fisheries Strategy, SEAFDEC and MRC organized the back to back "MRC/SEAFDEC Regional Stakeholder Consultation

on the Mekong Basin-Wide Fisheries Management Strategy” (11 Oct 2016) and “MRC/SEAFDEC Meeting of the Technical Advisory Body (TAB) in support of cooperation on Mekong fisheries” (12-13 Oct 2016) in Siem Reap, Cambodia. With the collaboration between MRC and SEAFDEC-Sweden Project, the Mekong Basin Wide Fisheries Strategy (BWFS) was endorsed in 2017. The Project also facilitated the MOU between MRC and SEAFDEC to cooperate in areas of common interest and in support of a continued regular riparian inter-governmental monitoring of fisheries related matters. SEAFDEC, through the SEAFDEC-Sweden Project, and MRC jointly hosted two regional events: the Regional Consultation on Formulation of Project Based Action Plan under the MRC Environment Management Division and the High Level Consultation on the EAFM in Lower Mekong Basin, from 19-20 December 2017 in Bangkok.

Bilateral dialogues between Cambodia and Lao PDR

The Project since 2014 has supported the bilateral dialogues between Cambodia and Lao PDR based on the existing MOU at that time. Through such dialogues, it was agreed that a series of workshops and trainings would be convened in 2015 to review the legal framework of the two countries, particularly for specific areas of Preah Vihear (Cambodia) and Champasak Province (Lao PDR). The purpose was to share information and raise awareness among concerned officers. The dialogues came up with the MoA between Cambodia and Lao PDR and the established work-plan for activities to be implemented in the border provinces of Stung Treng/Preah Vihear (Cambodia) and Champasak Province (Lao PDR).

One of the agreed items in the workplan was the comparative studies on laws and regulations between of Stung Treng/Preah Vihear (Cambodia) and Champasak Province (Lao PDR). Activities were facilitated by the Project in 2015 to conduct the review of the legal frameworks of the two countries applicable to the neighboring provinces with the aim to share information and raise awareness among concerned officers on relevant laws and regulations. The comparative study was completed in December 2016 and the results were discussed at the “Bilateral Workshop on Results of Comparative Study of Laws and Legislations of Cambodia and Lao PDR” on 6-8 December 2016 in Champasak, Lao PDR. The participants recognized the importance of the document as a basis to define common approaches to improve fisheries management, protect endangered species and reduce illegal practices. Recommendations on these three aspects were proposed for discussion at the next Cambodia – Lao PDR bilateral dialogue.

Bilateral Dialogue between Lao PDR and Thailand

During 2017-2018, fishing gear surveys were conducted in Bo Keo, Lao PDR, and Chiang Rai Province, Thailand, the results of which were discussed at the “Bilateral Technical Meeting on Effective Fisheries Management between Lao PDR and Thailand” on 29-30 October 2018 in Chiang Rai Province, Thailand. The Meeting found that the results could serve as basis for promoting cooperation between the two countries in the monitoring and control of fishing in the area, and balancing the use of available resources with the need to protect critical habitats. The Meeting also recommended ways to strengthen the transboundary resources management and conservation measures including the monitoring and control of fishing efforts that correspond to the existing fishing efforts and available resources in Bo Keo and Chiang Rai.

ix. Enhancing role of SEAFDEC and cooperation with ASEAN

The linkages and cooperation with ASEAN are of special importance. These are maintained through the ASEAN-SEAFDEC Strategic Partnership (ASSP). The results of the Project implementation are reported to the ASEAN Fisheries Consultative Forum (AFCF) and the ASEAN Sectoral Working Group on Fisheries (ASWGF). The results achieved are reported in the ASEAN policy mechanisms to improve regional cooperation and ASEAN Community building. From 2014, several project achievements have been reported to the ASEAN mechanism such as RPOA-Neritic Tunas, RPOA-Capacity, eACDS, Combatting IUU fishing, and Regional Approach for SSF.

x. Enhancing Coordination through the Regional Fisheries Policy Network (RFPN)

Since 2013, the SEAFDEC-Sweden Project has been supporting the participation of five officers from national fisheries agencies of Indonesia, Malaysia, Myanmar, Thailand, and Philippines. The Japanese Trust Fund supports three officers, from Cambodia, Lao PDR and Viet Nam. On an annual basis, these members of the RFPN team are posted at the SEAFDEC Secretariat for one year. The RFPN members play an active role in enhancing coordination and communication between SEAFDEC and their respective countries while also being given the opportunity to attend and provide technical contributions in various events organized by SEAFDEC.

xi. Implementing activities to Address Crossing Cutting Issues

Another important support from the Project to the Member Countries at policy and regional level by addressing cross-cutting issues including social well-being, human rights, livelihood development and the integration of gender aspects in small-scale fisheries.

Publication in relevance to Gender and SSF

- Gender in coastal and fisheries resources management: A regional synthesis report
- Gender analysis toolkit for coastal management practitioners
- Regional Dialogue on Gender Dimension in Coastal and Fisheries Resources Management in South Asia and Southeast Asia
- Policy Brief: Applying Human Rights-based and Gender Equality Approaches to Small-scale Fisheries in Southeast Asia
- SEAFDEC Gender Strategy
- Practical Guide for Gender Analysis in Small-Scale Fisheries and Aquaculture in Southeast Asia

The Project supported the rural and coastal communities in building up the ability to adapt to the effects of climate change, manage natural resources, conserve or restore critical habitats, develop and manage diversified livelihood options and alternative income-earning opportunities, and promote gender equity and equality. The Project engaged the partnership of NGOs and CSOs with considerable experience in rural development and a strong presence in the project sites. These are CORIN-Asia Cambodia, Learning Institute of Cambodia (coastal and Mekong) and the Sustainable Development Foundation (SDF, Thailand).

xii. Collaborating regional partners and mechanisms

At the regional level, cooperation is maintained with regional and international partners, organizations and relevant institutions to pool and share resources but also to avoid duplication of efforts. The partnerships enable continued sharing of information and, as needed, used as a leverage to secure additional resources. Organizations and initiatives include the ASEAN Secretariat, FAO/Rome, FAO Regional Office in Bangkok/APFIC, The Bay of Bengal Large Marine Ecosystems Project (BOBLME), Mangroves for the Future/IUCN, Regional Plan of Action (RPOA-IUU) to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region; Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security (CTI-CFF); Mekong River Commission (MRC), IUCN, WWF, International Collective in Support of Fish workers (ICSF); UN Environment/Fisheries *Refugia* Project, ILO, USAID/Oceans, and with national focal institutions in each of the ASEAN-SEAFDEC Member Countries. Through the national counterparts, links have been forged with other departments and authorities as well as relevant NGO's.

2. Reports, publication, materials, outputs of Activities in the Overall Project Duration

The completed List of Completed Publications and Others is shown in **Annex 1**.

3. Evaluation of the Project

The final project evaluation was conducted by external evaluation team (FCG Co Ltd.). The Inception was started on 3 July 2019. The methodology of the evaluation comprised several methods that includes desk study, interviews and questionnaires to all stakeholders. The field country visit was started from 28 August to 6 September 2019. The final report was expected to be submitted by mid of October 2019.

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List of Reports and Publication of the SEAFDEC-Sweden Project 2013-2019

1. General Documents/Reports (i.e. introduction, subcontracting, evaluation, etc.)	Year
1.1 Introduction of the new SEAFDEC-Sweden cooperation 2013-2017, 12 March 2013	2013
1.2 On-the-job training workshop on project designing, monitoring and evaluation (using Results Based Management), 4-7 Sept 2013	2013
1.3 Annual Progress Report 2013	2013
1.4 Annual Progress Report 2014	2014
1.5 Annual Progress Report 2015	2015
1.6 Annual Progress Report 2016	2016
1.7 Annual Progress Report 2017	2017
1.8 Annual Progress Report 2018	2018
1.9 Mid-Term Review Report	2015
2. Ecosystem Approach to Fisheries Management (EAFM)	
2.1 Evaluation Reports of On-site training programs on Ecosystem Approach to Fisheries Management (E-EAFM) and Training of Trainers on E-EAFM (not publicized)	
- Lao PDR/2-7 November 2015 (Pakse), TOT 25-29 April 2016 (Pakse), 4-9 December 2017 (Bokeo)	
- Myanmar/14-19 December 2015 (Yangon) and TOT on 27 June-1 July 2016 (Nay Pyi Taw)	
- Cambodia/5-10 September 2016 (Siem Reap) and TOT on 27-30 September 2016, 18-23 December 2017 (Kep)	
- Ranong, Thailand, 6-11 November 2017	
2.2 High Level Consultation on the EAFM in Lower Mekong Basin, 19-20 December 2017 (not publicized)	
3. Neritic Tuna in Southeast Asia	
3.1 http://www.seafdec.or.th/neritic-tunas/index.php	
3.2 Consultative Meeting on Regional Cooperation for Sustainable Neritic Tuna Fisheries in Southeast Asian Waters, 8-10 October 2013	2013
3.3 Experts Group Meeting on Regional Plan of Action on Sustainable Utilization of Neritic Tuna Resources in the ASEAN Region, 18-20 June 2014	2014
3.4 Stakeholder Consultation for the Regional Plan Of Action (RPOA) for Neritic Tuna Resources in the Philippines, Philippines	2014
3.5 Regional Plan of Action on Sustainable Utilization of Neritic Tuna in the ASEAN Region (RPOA-Neritic Tunas)	2015
3.6 1 st Meeting of the Scientific Working Group on Neritic Tuna Stock Assessment in the Southeast Asian Waters, 18-20 November 2014	2014
3.7 2 nd Meeting of Scientific Working Group on Neritic Tuna Stock Assessment in Southeast Asian Waters, 15-17 June 2015	2015
3.8 3 rd Meeting of Scientific Working Group on Neritic Tuna Stock Assessment in Southeast Asian Waters, 27-29 June 2016	2016
3.9 4 th Meeting of the Scientific Working Group on Neritic Tuna in Southeast Asian Waters, 7-9 November 2017	2017
3.10 5 th Meeting of Scientific Working Group on Neritic Tunas Stock Assessment in the Southeast Asian Waters (SWG-Neritic Tunas), 9-11 January 2019	2019
3.11 Special Training/Workshop on Stock Assessment of Longtail Tuna and Kawakawa in the Southeast Asian Region, 17-25 April 2016	2016
3.12 Workshop on Management of Longtail Tuna and Kawakawa Resources in the Southeast Asian Region and development of Ecosystem Approach to Fisheries Management (EAFM) as the Alternate Approach, 19-21 December 2016	2016
3.13 Training/Workshop on Risk Assessments and Fisheries Management Framework/Measures of Longtail Tuna and Kawakawa in Southeast Asia, 6-10 August 2017	2017
3.14 The Workshop on Stock Assessment of Indo-Pacific King Mackerel and Narrow-Barrel Spanish Mackerel in Southeast Asia, 16-20 July 2018	2018
3.15 The Population Study of <i>Thunnus tonggol</i> (Bleeker, 1851) in the Southeast Asian Region by MFRDMD (May 2017 to July 2018)	2018

3.16 Training Materials Stock Assessment (Basic Level 1)	
3.17 Training Materials Stock Assessment (Basic Level 2)	
3.18 Training Materials Stock Assessment (Advance)	
3.19 Standard Operating Procedure for Data Collection and Analysis of the Neritic Tunas	
3.20 Standard Operating Procedure for Collection and Preservation of DNA Tissue Samples	
3.21 Tuna Identification Sheet	
4. Transboundary Species Management	
<i>Gulf of Thailand Sub-region</i>	
4.1 Experts Group Meeting on Stock Status and Geographical Distribution of AIB Species in the Gulf of Thailand, Bangkok, Thailand, 22-23 September 2016	2016
4.2 Gulf of Thailand Technical Meeting on Management of Transboundary Species: Indo-Pacific Mackerel”, 19-20 December 2018	2018
4.3 Technical Consultative Meeting on Drafting of the Regional Action Plan for Management of Transboundary Species: Indo-Pacific Mackerel (<i>Rastrelliger brachysoma</i>) in the Gulf of Thailand Sub-region was held on 12-13 September 2019	2019 (drafting)
4.4 Regional Action Plan for Management of Transboundary Species: Indo-Pacific Mackerel (<i>Rastrelliger brachysoma</i>) in the Gulf of Thailand Sub-region	Draft (being finalized)
<i>Andaman Sea Sub-region</i>	
4.5 Technical Experts Meeting on Management of Trans-boundary Species for the Northern Andaman Sea Sub-region, 13-14 March 2018	2018
4.6 2 nd Technical Experts Meeting on Management of Transboundary Species for Northern Andaman Sea, 12-13 July 2018	2018
4.7 Technical Experts Meeting on Management of Trans-boundary Species for the Southern Andaman Sea Sub-region, 4-5 April 2018	2018
4.8 2 nd Technical Experts Meeting on Information Compilation of Transboundary Species as Scientific Basis for National Measures for Southern Andaman Sea, 10-11 July 2018	2018
5. Gulf of Thailand Sub-region	
5.1 4 th Meeting of the Gulf of Thailand Sub-region, 18-19 December 2013	2013
5.2 5 th Meeting of the Gulf of Thailand Sub-region, 28-29 September 2015	2015
5.3 6 th Meeting of the Gulf of Thailand Sub-region, 28 February-2 March 2016	2017
5.4 7 th Meeting of the Gulf of Thailand Sub-region, 1-2 November 2018	2018
5.5 8 th Meeting of the Gulf of Thailand Sub-region, 4-5 September 2019	2019 (drafting)
6. Andaman Sea Sub-region	
6.1 Sub-regional Consultative Meeting on the Collaborative Fisheries Management around the North Andaman Sea/Myeik Archipelago, Phuket, Thailand, 27-28 May 2014	2014
6.2 3 rd Meeting of the Andaman Sea sub-region, Bangkok, Thailand, 18-20 October 2016	2016
6.3 3 rd Sub-regional Consultative Workshop on Northern Andaman Sea/Myeik Archipelago, Bangkok, 16-17 November 2017	2017
6.4 Southern Andaman Sea Sub-regional Technical Meeting on Effective Fisheries Management, 21-22 November 2017	2017
6.5 4 th Meeting of the Andaman Sea sub-region, Bangkok, Thailand, 20-21 November 2018	2018
7. Mekong River Basin	
7.1 Experts Meeting on Mekong Cooperation on Fisheries, Aquatic Resources and Wetlands: 20-years lessons learnt	
7.2 MRC/SEAFDEC Regional Stakeholder Consultation on the Mekong Basin-Wide Fisheries Management Strategy, 11 October 2016	
8. Regional Plan of Action for Management of Fishing Capacity (RPOA-Capacity)	
8.1 Regional Technical Consultation on Development of Regional Plan of Action-Management of Fishing Capacity, Kuala Lumpur, Malaysia, 24-26 February 2015	2015
8.2 Experts Group Meeting on Development of Regional Plan of Action for Managing of Fishing Capacity, Songkhla province, Thailand, 19-21 August 2015	2015
8.3 2 nd Regional Technical Consultation on Development of Regional Plan of Action for Managing of Fishing Capacity, Phuket, Thailand, 15-17 December 2015	2015

8.4 ASEAN Regional Plan of Action for Management of Fishing Capacity (RPOA-Capacity)	2017
9. Combat Illegal, Unreported and Unregulated (IUU) Fishing	
<i>Electronic ASEAN Catch Documentation Scheme (eACDS)</i>	
9.1 eACDS brochure	
9.2 Web-application: https://play.google.com/store/apps/details?id=org.seafdec.e_acds&hl=en	
9.3 VDO: https://www.youtube.com/watch?v=6xa9vJT6t04&feature=share	
<i>Port State Measures</i>	
9.4 Experts Meeting on Regional Cooperation to Support the Implementation of Port State Measures in Southeast Asian Region from 2 to 4 February 2016	2016
10. Establishment of Monitoring, Control and Surveillance (MCS) Networks	
10.1 1 st Sub-regional Consultation on MCS for the Gulf of Thailand” in 1-2 November 2017	2017
10.2 The Gulf of Thailand Sub-Regional Monitoring, Control and Surveillance (MCS) Network Meeting, 20-21 June 2019	2019
10.3 Meeting on the Development of a Sub-regional Cooperation on Monitoring, Control, and Surveillance in Fisheries in the Northern Andaman Sea, 24-25 July 2018	2018
10.4 The Meeting on the Development of Monitoring, Control and Surveillance Network for Southern Andaman Sea, 20-21 August 2019	2019
11. Bilateral Collaboration	
<i>Gulf of Thailand Sub-region</i>	
11.1 First Technical Meeting of the Joint Working Team for Fisheries Management between Cambodia and Viet Nam, Phu Quoc Island, Kien Giang Province, Viet Nam, 5-7 March 2014	2014
11.2 Sub-regional Technical Meeting on Effective Fisheries Management between Malaysia and Thailand, Penang, Malaysia, 14-15 May 2014	2014
11.3 Technical Workshop of the Joint Committee for Fisheries Management between Cambodia and Viet Nam, Bangkok, Thailand, 6-7 October 2014	2014
11.4 Sub-regional Technical Meeting on Effective Fisheries Management between Cambodia and Thailand, Trat Province, Thailand, 20-22 January 2015	2015
11.5 2 nd Sub-regional Technical Meeting on Effective Fisheries Management between Malaysia and Thailand, in Bangkok, Thailand, 25-26 July 2017	2017
11.6 2 nd Technical Meeting of the Joint Working Team for Fisheries Management between Cambodia and Viet Nam, 17-18 October 2017	2017
11.7 2 nd Bilateral Technical Meeting on Effective Fisheries Management between Thailand and Viet Nam, 12-13 June 2018	2018
11.8 2 nd Sub-regional Technical Meeting on Effective Fisheries Management between Cambodia and Thailand, 29-30 August 2018	2018
11.9 Strengthen Malaysia and Thai Partnership in Support of Joint Fisheries Planning and Management in the Western Gulf of Thailand (conducted by TD in 2014)	2014
<i>Mekong River Basin</i>	
11.10 1 st Meeting of the Technical Working Group for Fisheries Management in Trans-boundary Areas between Cambodia and Lao PDR, Siem Reap, Cambodia, 2-4 June 2014	2014
11.11 Technical Working Group Meeting of the Joint Fisheries Management between Cambodia and Lao PDR, Bangkok, Thailand, 8-9 October 2014	2014
11.12 Bilateral Technical Meeting on Effective Fisheries Management between Lao PDR and Thailand, 29-30 October 2018	2018
11.13 Comparative Review of Laws and Regulations concerning Fisheries, Habitat Management and related Aspects between Cambodia and Lao PDR and between Cambodia and Viet Nam	2017
12. Socio-economics, i.e. gender, labour issues, etc	
<i>Small-Scale Fisheries, Gender and Human-rights based</i>	
12.1 Regional Technical Consultation (RTC) on a Regional Approach to the Implementation of the FAO Voluntary Guidelines for Securing Sustainable Small-Scales Fisheries in the Context of Food Security and Poverty Eradication, 7-9 June 2016	2016

12.2	Experts Workshop on Regional Approach for the Implementation of FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries: Human Rights- Based Approach and Gender-Equitability, 26-28 September 2017	2017
12.3	Policy Brief: Applying Human Rights-based and Gender Equality Approaches to Small-scale Fisheries in Southeast Asia	2018
12.4	Gender in coastal and fisheries resources management: A regional synthesis report (Collaboration between IUCN/SEAFDEC/SEI)	2018
12.5	Gender analysis toolkit for coastal management practitioners (Collaboration between IUCN/SEAFDEC/SEI)	2018
12.6	Regional Dialogue on Gender Dimension in Coastal and Fisheries (Collaboration between IUCN/SEAFDEC/SEI)	2018
12.7	SEAFDEC Gender Strategy	2019
12.8	The Experts Consultation Workshop on Guidance to Monitoring and Evaluation of Gender Equity and Social Well-being in Fisheries Communities, 8-10 August 2018	2018
12.9	Experts Consultation Workshop on Finalization of the Practical Guide for Gender Analysis in Small-Scale Fisheries and Aquaculture in Southeast Asia, 10-11 July 2019	2019 (in progress)
12.10	Practical Guide for Gender Analysis in Small-Scale Fisheries and Aquaculture in Southeast Asia	2019 (in progress)
Labor Issues		
12.11	1 st Regional Technical Consultation on Labor Aspects within the Fishing Industry in the ASEAN Region” on 25-27 February 2016	2016
Local knowledge and Adaption		
12.12	Final Report on Local Ecological Knowledge and Benefit Sharing Approaches for Small-island Fishery/Tourism Management on Lipe Island, Andaman Sea, Thailand	2014
12.13	Technical Guidelines on Local Ecological Knowledge and Benefit Sharing Approaches for Small-island Fishery/Tourism Management on Lipe Island, Andaman Sea, Thailand	2014
13. Local partners		
13.1	Learning Institute, Cambodia	
13.2	Fisheries Reforms And Right-Based Fisheries: Insights From Community Fisheries Across Cambodia	2015
13.3	Training Manual on “Leadership and Community Organizing” (2015)	2015
13.4	Training Manual on “Networking and Partnership Building (2015)	2015
13.5	Training Manual on “Proposal Development and Report Writing” (2015)	2015
13.6	TOT and Facilitation Skill Module (2015)	2015
13.7	Training Manual on “Natural Resource Management and Planning” (2015)	2015
13.8	VDO: Training on Gender in Community Fisheries Management	Available on youtube
13.9	VDO: Networking and Partnership Building Training in Battambang	Available on youtube
13.10	VDO: Training on NRM and Planning at Battambang Province (How to manage natural resource)	Available on youtube
13.11	VDO: Training on Leadership & Community Organizing Kampong Chhnang CFi	Available on youtube
13.12	VDO: Community Exchange visit video	Available on youtube
13.13	VDO: Participation of CFi member in Mangrove Plantation	Available on youtube
13.14	VDO: The change of women perspective from Bak Amrek CFi	Available on youtube
13.15	VDO: A Day in the Life of Srey Mom	Available on youtube
13.16	VDO: Youth in Communities Fisheries of Koh Keo	Available on youtube

Sustainable Development Foundation (SDF), Thailand	
13.17 An Integrated multi-stakeholder information system for ecosystem-based management of fisheries resources in Trat bay (<i>Thai version</i>)	
13.18 An Integrated multi-stakeholder information system for ecosystem-based management of fisheries resources in Trat bay	
13.19 Small-scale fishers and the ecosystem-based management of fisheries and marine and coastal resources in Trat bay	
13.20 Situational analysis of the potential climate change impacts on coastal communities: Recommendations for supporting the adaptation of communities emphasizing area-based, rights-based and gender sensitive approaches case study of the coastal communities of Trat bay	
CORIN-Asia Cambodia	
13.21 Final Report	
Other publications (outreach)	
SEAFDEC Fish for the People	
SEAFDEC Newsletters	
GAF7: Expanding the Horizons Long Report The 7 th Global Conference on Gender in Aquaculture & Fisheries	

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2019**

			Project ID: 201506004
Program Categories:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	The Oceans and Fisheries Partnership (USAID Oceans)		
Program Strategy No.:	Special Project	Total Duration:	May 2015 – May 2020
Lead Department:	Training Department (TD)	Lead Country:	Thailand
Donor/Sponsor:	U.S. Agency for International Development (USAID Oceans)	Total Donor Budget:	USD 19,953,018
Project Partner:	USAID, SEAFDEC, CTI-CFF	Budget for 2019:	USD 3,958,737
Project leader:	John Parks	Involved Country:	All ASEAN, CTI-CFF Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

The Oceans and Fisheries Partnership (USAID Oceans), a USAID-funded activity implemented by Tetra Tech ARD, works to strengthen regional cooperation to combat illegal, unreported, and unregulated (IUU) fishing; promote sustainable fisheries; and conserve marine biodiversity in the Asia-Pacific region. USAID Oceans works to (1) strengthen regional cooperation and capacity to combat IUU fishing and conserve marine biodiversity, (2) expand use of eCDT systems to priority biodiversity areas, (3) strengthen the capacity of regional and national organizations to conserve biodiversity using an Ecosystem Approach to Fisheries Management (EAFM) and eCDT, (4) address human welfare concerns, including gender and labor across all program activities, and (5) engage the private sector to ensure sustainability, while advancing regional fisheries governance.

Key project activities include:

Strengthen the capacity of regional, national, and local partners.

Support the development of transparent, financially sustainable eCDT systems and complementary Sustainable Fisheries Management Plans (SFMPs), tested in at least two fisheries in priority biodiversity areas.

Enhance fisheries management through EAFM.

Forge partnerships with the public and private sectors to ensure system uptake and sustainability.

Incorporate cross-cutting human welfare considerations into all activities.

Key objectives for 2018-2019 (Program Year 4 of 5) include:

Regional Coordination - Capacity of SEAFDEC, CTI-CFF, and Technical Working Group (TWG) strengthened; Regional CDT Guidance and Roadmap developed.

eCDT – Learning site eCDT systems refined and strengthened, with over 2,000 metric tons of seafood successfully tracked; Support extended for Expansion Country eCDT system development and implementation through strategically-targeted technical assistance; support provided for implementation and expansion of the SEAFDEC eACDS.

EAFM – Sulu-Sulawesi Seascape Sub-Regional EAFM Plan endorsed; Learning Site EAFM Plans finalized and delivered; and use of eCDT data for sustainable fisheries management tested through targeted learning site grants.

Public-Private Partnerships – Strategic partnerships launched and maintained to support eCDT system development, implementation, sustainability, and expansion.

Human Welfare – Gender intervention grants implemented in learning sites; TWG network and regional fisheries network further strengthened and capacity enhanced.

2. Background and Justification

Asia's fish stocks and coral reefs are in danger as a result of unsustainable fishing practices, which threaten biodiversity, food security, and livelihoods. Across the region, Southeast Asia's fisheries are in a state of overcapacity. Overfishing, combined with IUU and destructive fishing practices, have serious impact to the region—some of the world's most marine biodiverse areas. These impacts can be seen throughout the region, resulting in fisheries decline, threatened regional and global food security, and serious human welfare concerns.

Thus, the Oceans and Fisheries Partnership (USAID Oceans) was launched to strengthen regional cooperation and capacity to ensure the sustainability of Southeast Asia's marine resources. USAID Oceans supports SEAFDEC's ongoing work to develop and implement the electronic ASEAN Catch Documentation Scheme (eACDS) as well as related national level efforts. Work on the eACDS is strategically important to improving data/information availability, sustainable fisheries management programs, and overcapacity and IUU fishing reduction efforts.

3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: Strengthen regional cooperation and capacity to combat IUU fishing and conserve marine biodiversity	Outcome 1: Regional and national organizations engaged in and capable of combatting overcapacity and IUU fishing through the use of eCDT and complementary SFMPs	Output 1: Trainings and capacity-building delivered to regional and national organizations in eCDT and EAFM planning	Activity 1– Regional Support for Increased Cooperation and Capacity in the areas of eCDT, EAFM, PPP, and Human Welfare Activity 2– Support to Philippines and Learning Site of General Santos City
Objective 2: Support the development and expansion of financially sustainable eCDT systems in priority biodiversity, areas where sustainable fisheries management plans (SFMPs) are being applied	Outcome 2: Overcapacity and IUU fishing in expansion areas reduced	Output 2: eCDT systems with complementary SFMP rolled out in at least two learning sites and expansion areas	Activity 3– Support to Indonesia and Learning Site of Bitung Activity 4– Support to Expansion I and II Countries
Objective 3: Develop and strengthen human and institutional capacity of regional organizations to conserve marine biodiversity through an EAFM	Outcome 3: Regional and national organizations engaged in and capable of using eCDT for enhanced sustainable fisheries management	Output 3: SFMPs developed, adopted, and implemented in priority biodiversity areas	

Objective	Outcomes	Outputs	Activities
Objective 4: Address and strengthen capacity for human welfare, including gender and labor across all program activities	Outcome 4: Increased awareness and capacity for human welfare aspects of fisheries	Output 4: Gender interventions implemented via program grants, increased capacity for human welfare advocacy	
Objective 5: Develop public-private partnerships (PPPs) to conserve biodiversity, promote sustainable fisheries management, and combat IUU fishing and seafood fraud	Outcome 5: Private and public sectors engaged in development, implementation and sustainability of eCDT to combat overcapacity and fishing	Output 5: Private and public sector partnerships, investments	

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1– Regional Support for Increased Cooperation and Capacity in the areas of eCDT, EAFM, PPP, and Human Welfare	USAID Oceans will support increased regional cooperation and capacity building across its core program technical focus areas, which includes support to SEAFDEC on the further development and expansion of the eACDS.
Activity 2– Support to Philippines and Learning Site of General Santos City	USAID Oceans will continue working closely with the Philippines Bureau of Fisheries and Aquatic Resources (BFAR) to demonstrate the learning site eCDT system and implement complementary project objectives, including EAFM, human welfare, and partnership development. These activities will both strengthen the Philippines’ capacity to combat IUU and conserve marine biodiversity, as well as generate lessons learned for regional dissemination.
Activity 3– Support to Indonesia and Learning Site of Bitung	USAID Oceans will continue working closely with the Indonesia Ministry of Maritime Affairs and Fisheries (MMAF) to demonstrate the learning site eCDT system and implement complementary project objectives, including EAFM, human welfare, and partnership development. These activities will both strengthen Indonesia’s capacity to combat IUU and conserve marine biodiversity, as well as generate lessons learned for regional dissemination.
Activity 4– Support to Expansion I and II Sites	Technical support and capacity building activities will be conducted with Expansion Countries to support eCDT planning and implementation, sustainable fisheries management, and human welfare interventions.

3.3 Activity, Sub-activity and Proposed Budget for 2013-2019

Activities 1-4 represent USAID Oceans' tiered approach, dividing efforts into regional and national support through project learning sites and established Expansion Site I and II countries. Budget allocations are as follows:

34% Regional Support – 50% Activity 1; 50% Activity 4

33% National and Learning Site Support (Philippines – Activity 2)

33% National and Learning Site Support (Indonesia – Activity 3)

(Unit: USD)

Activity	Sub-Activity	Y1 2016	Y2 2017	Y3 2018	Y4 2019	Y5 2020
Activity 1– Regional Support for Increased Cooperation and Capacity	Sub-activities 1.1-6: Support Regional Capacity Building and Coordination; Develop and Implement a Regional PPP and Industry Engagement Strategy; Build Regional Capacity for CDT; Support Development of Regional Fisheries Management Plan(s); Integrate Fair Labor and Gender Equity Considerations at the Regional Level; Implement Regional Communication Strategy	639,282	762,940	694,123	672,985	675,121
Activity 2– Support to the Philippines and Learning Site of General Santos City	Sub-activities 2.1-6 – Integrated Support for National and Local Activities; Support and Develop Partnerships to Strengthen National and Local Impact; Develop and Implement eCDTS; Develop Fisheries Management Plan; Integrate Fair Labor and Gender Equity Considerations	1,278,565	1,525,880	1,388,246	1,306,383	1,310,530
Activity 3– Support to the Indonesia and Learning Site of Bitung	Sub-activities 3.1-6 – Integrated Support for National and Local Activities; Support and Develop Partnerships to Strengthen National and Local Impact; Develop and Implement eCDTS; Develop Fisheries Management Plan; Integrate Fair Labor and Gender Equity Considerations	1,278,565	1,525,880	1,388,246	1,306,383	1,310,530
Activity 4– Support to Expansion I and II Sites	Sub-activities 4.1-2 – Provide technical and capacity building support to Expansion sites.	639,282	762,940	694,123	672,985	675,121
TOTAL	Total Budget	3,835,697	4,577,642	4,164,739	3,958,736	3,971,304

***NOTE: Budget numbers are indicative. Total numbers reflect projected budget allocations. Sub-totals are a reflection of the estimated cost distribution. Only total funds expended by year will be available reflecting USAID Fiscal Year reporting requirements. USAID funds are subject to its availability as determined by the United States Congress on a yearly basis.**

PART II: ACHIEVEMENTS OF 2019 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Objective 1: Strengthen regional cooperation and capacity to combat IUU fishing and conserve marine biodiversity

Coordinated with partners SEAFDEC and CTI-CFF, including to plan the Partnership's final regional workshop, to be held in December 2019, to review the draft *Regional Technical Guidance for eCDT*, which was developed throughout the year through a series of regional consultations and workshops.

Held a series of technology roadshows across the region to share eCDT technology solutions, including the eACDS, and enable partners to share their lessons learned, experiences implementing technologies with SEAFDEC Member Countries.

Coordinated closely with Philippine Bureau of Fisheries and Aquatic Resources (BFAR) and Indonesia Ministry of Marine Affairs and Fisheries (MMAF) to implement and plan national and learning site activities, particularly implementation of the learning site eCDT system; and with Expansion Site Countries (Thailand, Viet Nam, Malaysia, Mekong Countries, and Coral Triangle Countries) to support development, implementation of future eCDT systems.

Objective 2: Support the development and expansion of financially sustainable eCDT systems in priority biodiversity, areas where sustainable fisheries management plans (SFMPs) are being applied

Released eCDT capstone product to complement previously released thought leadership publications, which provides an overview of USAID Oceans-supported eCDT technology solutions, including the SEAFDEC eACDS.

Continued to work with SEAFDEC regarding the rollout of the eACDS in expansion countries, including discussions with Viet Nam and Malaysia on their interests to implement the system (with USAID Oceans support). By year's end, provided support to Viet Nam eACDS pilot, including through the procurement of supporting hardware and hiring coordination staff.

Advanced the Philippines, Indonesia learning site eCDT system through eCDT technology installations and live, in-field data testing with First Mover industry and small-scale partners. Tracked over 2,000 metric tons of seafood through piloted technology.

Objective 3: Develop and strengthen human and institutional capacity of regional organizations to conserve marine biodiversity through an EAFM

Finalized and submitted draft of Sub-Regional Sulu-Sulawesi Seascape Sustainable Fisheries Management Plan for endorsement through the CTI-CFF Regional Secretariat.

Finalized and delivered learning site Sustainable Fisheries Management Plans in Indonesia and the Philippines. Awarded grants to local organizations in Indonesia and the Philippines to leverage eCDT data for enhanced, data-driven fisheries management.

Objective 4: Address and strengthen capacity for human welfare, including gender and labor across all program activities

Awarded grant to the National Network on Women in Fisheries in the Philippines to implement Human Welfare and Gender interventions. Began implementing interventions in Indonesia through program staff and partners.

Released program capstone product, *Gender in Fisheries Research: Training Handbook* to build capacity in gender-sensitive research and fisheries development. Began production of two gender-focused videos, in collaboration with SEAFDEC, to be released in late 2019.

Supported the finalization of SEAFDEC’s organizational gender strategy and served as a resource person to relevant trainings and workshops.

Engaged Human Welfare and Gender TWG counterparts through in-person meetings in both learning sites to plan events that engage industry and government representatives in the development of gender guidelines and policies.

Objective 5: Enhance PPPs to conserve biodiversity, promote sustainable fisheries management, and combat IUU fishing and seafood fraud.

Explored potential partnerships with leading technology companies, such as IBM and Amazon Web Services, to support program innovations and sustainability; as well as with organizations such as TrinityRoots, to support eCDT expansion.

Maintained longstanding partnerships in support of cross-cutting program objectives, such as with local small-scale traceability device provider, FAME, to test the Catch Documentation and Traceability System with “first movers” in three Philippine small-scale landing sites.

Leveraged over \$3.4 million dollars over the life of the program (to date) from public and private sector partners.

Engaged with regional partners to coordinate partnership efforts in Indonesia, including the launch of the Indonesia Coastal Tuna Sustainability Alliance.

2. Information of Present Year Activity including Involved Stakeholders

During FY19, USAID Oceans conducted the training activities such as

List of Actual Sub-activity	Type of activity*	Number of Participants		Budget Spent (USD)
		M	F	
Activity 1 - Regional				
Sub-activity 1.1 - Workshop to Review Available eCDT Technology Solutions and Advance Regional Guidance for Fisheries Traceability for CTI-CFF (<i>overlaps with Activity 4</i>)	T	28	17	
Sub-activity 1.2 - Workshop to Review Available eCDT Technology Solutions and Advance Regional Guidance for Fisheries Traceability for Viet Nam (<i>overlaps with Activity 4</i>)	T	29	8	
Sub-activity 1.3 - Workshop to Review and Advance Regional Guidance for Fisheries Traceability (Philippines)	T	19	26	
Sub-activity 1.4 - Workshop to Review and Advance Regional Guidance for Fisheries Traceability (Indonesia)	T	Not available	Not available	
Activity 2 - Philippines				
Sub-activity 2.1 - BFAR eCDTS User Training	T	31	45	

List of Actual Sub-activity	Type of activity*	Number of Participants		Budget Spent (USD)
		M	F	
Sub-activity 2.2 - Presentation of the Sarangani Bay and Sulawesi Seas Sustainable Fisheries Management Plan	T	36	13	
Sub-activity 2.3 - Workshop on Progress Monitoring of Fisheries Annex Implementation	T	24	15	
Sub-activity 2.4 - Empowering Fisheries Officers for Gender Responsive and Sustainable Fisheries Management	T	13	29	
Activity 3 - Indonesia				
Sub-activity 3.1 - Review and Finalization Workshop of the EAFM Plan for FMA 716, Indonesia	T	14	17	
Activity 4 – Expansion – <i>see also Activity 1</i>				

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activities 1.2-4 - Workshops to Review Available eCDT Technology Solutions and Advance Regional Guidance for Fisheries Traceability	Enhanced capacity; Progress in development of Regional Guidance	Inputs received from Member Countries; capacity further strengthened; opportunities developed for further collaboration (including application of program-supported technologies)
Activity 2		
Sub-activity 2.1 - BFAR eCDTS User Training	Enhanced capacity for eCDT implementation	Capacitated partner First Movers to use BFAR eCDT System
Sub-activity 2.2 – Presentation of the Sarangani Bay and Sulawesi Seas Sustainable Fisheries Management Plan	Advanced SFMP toward implementation	Built partner capacity in EAFM; progressed the SFMP toward finalization and implementation
Sub-activity 2.3 - Workshop on Progress Monitoring of Fisheries Annex Implementation	Advanced fisheries management efforts	Built partner capacity in EAFM; discussed progress of Fisheries Annex implementation
Sub-activity 2.4 - Empowering Fisheries Officers for Gender Responsive and Sustainable Fisheries Management	Enhanced participants' capacity in gender equity awareness	Built partner capacity in human aspects of fisheries; Enhanced capacity to make gender-sensitive policy and regulatory decisions.
Activity 3		
Sub-activity 3.1 - Review and Finalization Workshop of the EAFM Plan for FMA 716, Indonesia	Advanced SFMP toward implementation	Built partner capacity in EAFM; progressed the SFMP toward finalization and implementation
Activity 4 – see Activity 1		

4. List of Completed Publications and Others

List of completed publications for the year 2019	Type of media	Attached e-file
1. Making Waves: Issue 6		Link
2. Technology Solutions for Electronic Catch Documentation and Traceability (eCDT)		Link
3. Case Study: The Value of Traceability for Business (Anova Food, LLC.)		Link
4. Case Study: The Value of Traceability for Business (PT. Nutrindo)		Link
5. Gender Research in Fisheries and Aquaculture: A Training Handbook		English Thai Bahasa Indonesian
6. Thailand CDT Gap Analysis		English Thai
7. Sub-Regional Ecosystem Approach to Fisheries Management Plan for the Sulu-Sulawesi Seascape		Link
8. Trafiz Product Guide		Link
9. Making Waves Issue: Issue 7		Link
10. Assessing Fisheries in a New Era: Extended Guidance for Rapid Appraisals of Fisheries Management Systems		English [EN] Technical Annexes Bahasa Indonesian [ID] Technical Annexes
11. Sustainable Fisheries Management Plan for the Sarangani Bay and Sulawesi Sea: Region 12, Philippines		Link
12. Sustainable Fisheries Management Plan for Fisheries Management Area 716, Indonesia		Link
13. Fisheries Annex: Protected Area Management Plan for the Sarangani Bay Protected Seascape, Region 12, Philippines (2016 – 2021)		Link
14. Partnership Appraisal and Prioritization Report: Malaysia		Link
15. Partnership Appraisal and Prioritization Report: Thailand		Link
16. Partnership Appraisal and Prioritization Report: Viet Nam		Link
17. Workshop to Review Available eCDT Technology Solutions and Advance Regional Guidance for Fisheries Traceability in the Coral Triangle Region		Link

5. Major Impacts/Issues

Report on any issues or problems that have impacted on the development and implementation of the project during the reporting period. Provide detail on impacts of any issues on the achievement of project targets, and set out a plan on how to tackle these issues.

Since its launch USAID Oceans has utilized an adaptive management approach, learning from demonstrated best practices and aligning its operational strategy with on-the-ground realities. In Year Three, USAID Oceans undertook an Internal Midterm Review process, as well as engaged in several reflective exercises with USAID leadership. These activities, including the program’s “Pause and Reflect” Workshop, allowed the program to carefully and systematically reflect on program experiences and lessons learned. In Year Four, the program applied these lessons learned, challenges, and observed opportunities to continually optimize implementation.

In its fourth year, the program spent time reflecting on lessons learned to share them with its regional partners. While significant challenges were not faced, none to threaten the program’s progress, the program team noted the following challenges in the Year Four reporting period.

Changing partner priorities – Throughout FY19, USAID Oceans team explored partnership opportunities with a number of potential partners. Some partnership opportunities were formalized, while others did not move forward due to partners' shift in their priorities. This is not uncommon in either the public or private sectors, and USAID Oceans remained nimble to adjust to changing partner priorities, leadership, and opportunities for engagement. In response to this challenge, the program's PPP team highlighted the value and importance of **leveraging the momentum and success of past activities and/or partnerships**. For example, in February, USAID Oceans worked with GDST to successfully organize the first Trackathon, with products/tools from the event receiving pilot opportunities and follow-on investments. Building off previous success, USAID Oceans, GDST, and SecondMuse will host a Bali Seafood Trackathon in October 2019. The objective of this Trackathon is to produce immediate solutions for the region, such as how to provide small-scale fishers with greater market access and how to develop applications that incentivize the collection of human welfare KDEs.

Building capacity amongst women despite limitations to women's participation – In several Year Four activities, USAID Oceans noted that despite organizing events, women's participation in some activities, particularly trainings and technology development, might be limited due to cultural norms. In recognition of this challenge, the team recognized the importance of **considering target participants' limitations during planning stages**. Understanding social, familiar and economic limitations women face and building the capacity of partners and stakeholders to incorporate gender considerations in their work is necessary to identify ways to have women participate in and benefit from program activities. For example, if women are not allowed to attend at training unless accompanied by a trusted male leader this should be considered when planning the training.

Delays in scheduling partnership activities – As common in complex implementation plans with multiple partners, USAID Oceans experienced several delays in implementing planned activities due to partners' scheduling conflicts, resource limitations, and competing priorities. USAID Oceans needed to work with partners to discuss whether additional resources were required to conduct partnership activities, adjust timelines, and manage both parties' expectations and reputations. The program team remained conscious of the need to **account for changes in activity planning** and prepare to adapt to changes when possible in order to maintain positive and productive partnerships.

Tailoring interventions to new contexts – In Year Four, as the program shared its lessons learned across the region, it spent significant time considering how to contextualize solutions, recommendations, or interventions from the learnings sites to other regions and countries specific needs, cultural context, and resource availability. The program **leveraged its TWG connections** as a platform to solicit input and ideas from representatives of countries where program interventions are being adopted in regard to how the intervention or tools can be adapted to the country context and what resources are available to support implementation.

Summary of Project Achievements (for the project of 2 years and over which will be completed by the year 2019, e.g. JTF-6 Phase I)

Establishing legal, regulated, and responsible fisheries requires intergovernmental and regional cooperation to address the complex challenges of Southeast Asia's often interconnected marine resources, diverse ecosystems, and multi-tiered supply chains. Effective solutions require close coordination, collaboration, and mutual support—and as such, USAID Oceans dedicated much of its first three years to building the strong foundation required for regional collaboration; conducting research and design required to implement its core interventions; and establishing itself as a regional resource for technical guidance relating to eCDT standards, technical architecture and systems interoperability, sustainable fisheries management, private sector engagement, and the human aspects of the fisheries ecosystem and economy. From these investments, during Year Four, USAID Oceans continued to work with its regional, national and local partners and focused on **sharing** its knowledge, experiences, resources and tools; **expanding** the reach of its work, working closely with expansion countries to apply learning site-developed best practices and resources; and **sustaining** the impacts of the program, working with longstanding and new partners to develop partnerships that will propel USAID Oceans' successes beyond the life of the program.

In Year Four, to prepare for the final year of the program and sustainability beyond 2020, USAID Oceans continued piloting and building partners' capacity to implement the program's **seven eCDT technologies in its Indonesia and Philippines learning sites**—which by year's end had met and exceeded the program's performance target, tracking over 3.4 metric tons of seafood from its point of catch to the dinner plate, or approximately USD \$20 million of U.S.-imported product.

These technologies promote global stability by providing fisheries managers with essential information that allows them to sustainably manage Southeast Asian food stocks and marine resources, and even enhance maritime security. Of the industry members who piloted USAID Oceans' seafood traceability technologies in Indonesia and the Philippines, 91% of users have adopted the technology, leading the way for broad-scale national and regional adaptation and expansion of these high-impact tools.

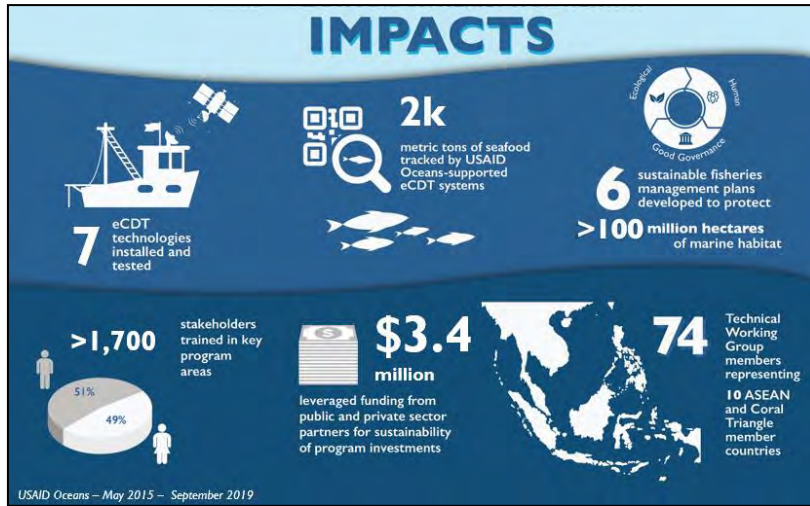
The program also continued providing technical support to ASEAN and CTI-CFF expansion countries to further regional eCDT adoption, uptake, and replication through a series of technology roadshows, coupled with one-on-one technical guidance. The program worked with SEAFDEC to expand eCDT technology into Viet Nam, providing technical and procurement support to the country's pilot of the Electronic ASEAN Catch Documentation Scheme (eACDS). It also began and completed the development of its Regional eCDT Technical Guidance document, requested by ASEAN Member Countries to establish standards and protocol for eCDT system design, development, and implementation. Final ASEAN and SEAFDEC review of the document will be completed in Year Five.

Other areas of the program made equally impactful strides in Year Four. The program not only progressed its learning site Ecosystem Approach to Fisheries Management (EAFM) Sustainable Fisheries Plans, handing them over to its Philippines and Indonesia counterparts by the end of the year to move forward to implementation, but also presented the program-supported Sub-Regional EAFM Management Plan for the Sulu-Sulawesi Seascape for adoption at CTI-CFF's Senior Officials Meeting. The plan was endorsed by the CTI-CFF EAFM Working Group and is now the first known sub-regional EAFM plan documented in fisheries management literature. It proposes specific management goals, objectives, and management actions to be undertaken by relevant governmental agencies, non-governmental partners, and multi-lateral/regional organizations focused on fisheries management and biodiversity conservation in Indonesia, Malaysia, and the Philippines. With USAID Oceans' support to develop and implement sub-regional and national sustainable fisheries management plans, Southeast Asian nations improved their natural resource management by protecting marine habitat areas that are over 1.5 times the size of the United States.

Interest in the program's human welfare expertise and demand for support continued to grow in the region, and beyond, as USAID Oceans continued to shine the light on sectoral gender inequities and the inspiring women and men behind regional movements for more fair, equitable, and prosperous work places. Throughout the year, the program continued to engage partners in the region, awarded a dedicated gender equity-focused grant in the Philippines, and facilitated networking to strengthen regional capacity and ensure human aspects are central to development discourse and its implementation. The program also launched its Gender Research in Fisheries and Aquaculture: Training Handbook, which in less than a year has been downloaded nearly 1,000 times in over 80 countries. Much like the program's human welfare expertise, the guide has become a well-established and commonly-referenced global resource for conducting gender-sensitive research that enables equitable decision making, promotes women's empowerment, and advocates for improved governance and regulation within the fishing industry.

Many of USAID Oceans' Year Four successes were underwritten by the Public-Private Partnerships (PPP) team, who continued to bridge public and private sector members and interests for regional, national, and local action. By year end, over \$3.4 million had been leveraged through engaging with public and private sector partners that are keen to build on the program's electronic seafood traceability systems, fisheries management approaches, and gender equity efforts through ongoing partnerships and activities following program's close. These demonstrated commitments support continued program progress and scaling, fortify U.S. Government investment, and strengthen the overall sustainability of program impacts. Partnerships developed throughout the year to continue the program's work beyond 2020 are detailed throughout this report.

At the end of Year Four, USAID Oceans' efforts drew the program closer to its Life of Activity Monitoring and Evaluation (M&E) targets, with notable impacts (below) not just in the program's learning sites but reaching to each of its Member Countries.



Annex 5

NEW PROPOSED PROJECTS FOR THE YEAR 2020

Project id.* ¹	Strategy/Project Title	Lead Department	Period	Appendix no.
202001012	Strengthening a Regional Cooperation and Enhancing National Capacities to Eliminate IUU Fishing in Southeast Asia	TD	2020-2024	1
202006007	Harmonization and Enhancing Utilization of Fishery Statistics and Information	SEC	2020-2024	2
202001013	Responsible Fishing Technology and Practice	TD	2020-2024	3
202002003	Enhancing Food Safety and Competitiveness of Seafood Products	MFRD	2020-2024	4
202006008	Assistance for Capacity Development in the Region to Address International Fisheries-related Issues	SEC	2020-2024	5
202004005	Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD	2020-2024	6
202005003	Sustainable Utilization of Anguillid Eels in the Southeast Asian Region	IFRDMD	2020-2024	7
202001014	Sustainable Utilization of Fisheries Resources and Resources Enhancement in Southeast Asia	TD	2020-2024	8
202004006	Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region	MFRDMD	2020-2024	9
202003003	Sustainable Aquaculture through Cost-Effective Culture Systems, and Prompt and Effective Aquatic Animal Health Management	AQD	2020-2024	10
202005004	Management Scheme for Inland Fisheries in the Southeast Asian Region	IFRDMD	2020-2024	11
202001015	Small-scale Fisheries Management for Better Livelihood and Fisheries Resources	TD	2020-2024	12
202003004	Development of Stock Assessment Method for Strengthening of Resources Management Measures of Tropical Anguillid Eels in AMS	SEC	2020	13

Y = Program implemented during the year

N = Program not implemented during the year

¹ Project id contains the following :The first four digits mean the starting year, the next two digits mean the lead department (TD=01, MFRD=02, AQD=03, MFRDMD=04, IFRDMD=05, SEC=06), and the last three digits are the running number.

PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

		Project ID: 202001012	
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Strengthening Regional Cooperation and Enhancing National Capacities to Eliminate IUU Fishing in Southeast Asia		
Program Strategy No:	IV	Total Period:	2020 - 2024
Lead Department:	Training Department (TD)	Lead Country:	To be indentified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 450,000
Project Partner(s):	None	Budget for 2020:	USD 90,000
Lead Technical Officer:	Kongpathai Saraphaivainch, Head, Training and Information Section / TD	Project Participating Country(ies):	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

In the global and regional situation of IUU fishing, SEAFDEC/TD has been implementing the project titled “Promotion of Countermeasures to reduce IUU Fishing” in coordination and cooperation with SEAFDEC Member Countries to reduce IUU fishing activities in the region from 2013 to 2019 under the JTF 6. The activities such as the development of a regional database on fishing vessels (Regional Fishing Vessels Record: RFVR), regional cooperation to support the implementation of Port State Measures (PSM) through the capacity development, and the development and promotion of an electronic ASEAN Catch Documentation Scheme (eACDS) were undertaken. To continue to support the Member Countries in the region for combating IUU fishing as recommended by the Council Meeting, this project titled “Strengthening a regional cooperation and enhancing national capacities to eliminate IUU fishing in Southeast Asia” is implemented under the JTF 6-II for the year 2020-2024. Under the project overall objectives “Sustainable utilization and sound management of fisheries resources in the Southeast Asia”, objectives”, the project expects five outputs; 1) enhancing RFVR, 2) strengthening national capacities in the implementation of PSM, 3) further promoting eACDS, and 4) coordinating and promoting a national/regional/international network for collaborative activities to combat IUU fishing.

2. Background and Justification

Illegal, Unreported and Unregulated (IUU) fishing can take place in all capture fisheries. Efforts to conserve and manage fish stocks are undermined by IUU fishing, which can lead to the collapse of fisheries or can seriously impair efforts to rebuild fish stocks that have already been depleted. This may result in the loss of both short- and long-term social and economic opportunities and could have negative impacts on food security.

The Plan of Action on Sustainable Fisheries for Food Security Towards 2020 adopted at the “ASEAN-SEAFDEC Conference on Fish for the People 2020: Adaptation to a Changing Environment” held in Bangkok, Thailand, 13-17 June 2011, emphasized on: 1) strengthening regional and national policy and legislation to implement measures and activities to combat IUU fishing, including the development and implementation of national plans of action to combat IUU fishing, and promoting the awareness and understanding of international and regional instruments and agreements through information dissemination campaigns, 2) establishing and strengthening regional and sub-regional coordination on fisheries management and efforts to combat IUU fishing including the development of regional/sub-regional Monitoring, Control and Surveillance (MCS) networks, 3) facilitating consultative dialogue among fisheries legal officers to share, at the sub-regional/regional level, perspectives of the respective legal and regulatory framework in terms of developing MCS-networks and to take action to combat IUU fishing, and 4) building up capacity among Member Countries, including functions for regional and sub-regional cooperation, to effectively meet the requirements of Port State Measures and flag state responsibilities.

Moreover, at the “High-level Consultation on Regional Cooperation in Sustainable Fisheries Development Towards the ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products” held in Bangkok, Thailand, on 3 August 2016, the ASEAN-SEAFDEC Member Countries declared and planned under relevant international laws and arrangements to combat IUU fishing in the Southeast Asian region and enhance the competitiveness of ASEAN fish and fishery products in the region and internationally.

Following the directions of the “Resolution and Plan of Action for 2020” and declaration, the SEAFDEC Training Department (TD) has been implementing the project titled “Promotion of Countermeasures to reduce IUU Fishing” in coordination and cooperation with SEAFDEC Member Countries to reduce IUU fishing activities in the region from 2013 to 2019 under the JTF 6. In respond to a request from all the Member Countries for SEAFDEC’s continued technical support for combating IUU fishing in the countries and region, SEAFDEC has planned a new project titled “Strengthening a regional cooperation and enhancing national capacities to eliminate IUU fishing in Southeast Asia” under the JTF 6-II for the year 20020-2004.

3. Gender Sensitivity of the Project

The project open and equalize for gender sensitivity. All implementation activities is not limited for man only, women and all sex can engagement, relevant and participation.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives)	Indicators	Means of Verification
Sustainable utilization and sound management of fisheries resources in Southeast Asia	<ul style="list-style-type: none"> - Healthy fisheries resources - Regional / sub-regional cooperation in fisheries resources management - Responsible fisheries practice maintained 	<ul style="list-style-type: none"> - Effective and efficient fisheries resources management - Improved regional cooperation in fisheries resources management
OUTCOME	Indicators	Means of Verification
Countermeasures to reduce IUU Fishing in Soust Asia	<ul style="list-style-type: none"> - Effective and efficient implementation of National Plan of Action on IUU Fishing (NPOA-IUU) - All AMSs developed NPOA-IUU - Regional / sub-regional cooperation to combat IUU fishing 	<ul style="list-style-type: none"> - Implementation plan of NPOA-IUU - NPOA-IUU developed in all AMSs - Improved a regional / sub-regional cooperation in Southeast Asia
OUTPUT 1	Indicators	Means of Verification
Enhancing the utilization and improvement of Regional Fishing Vessels Record (RFVR) Database	<ul style="list-style-type: none"> - Number of users accessing the RFVR Database through the website - Improved RFVR Database 	<ul style="list-style-type: none"> - Increased number of RFVR Database usage - Updates of the information for RFVR Database
Activity 1	Indicators: key inputs (Number to conducted, Where, Time)	Means of Verification
Activity 1.1: Regional technical consultation to improve the utilization of RFVR 24 meters, and develop the Watch List	<ul style="list-style-type: none"> - Regional technical consultation organized - Expected number 10 of participants from AMS per meeting - Watch List developed 	<ul style="list-style-type: none"> - Consultation report - Number 10 of participants from AMS per meeting - Watch List
Activity 1.2: National training to promote RFVR Database to ASEAN Member States (AMSs)	<ul style="list-style-type: none"> - National training conducted - Expected number 20 of participants per training 	<ul style="list-style-type: none"> - Training report - Number 20 of participants per training

GOAL (Overall Objectives)	Indicators	Means of Verification
Activity 1.3: Sub-regional or bilateral meeting to develop the application of RFVR to support the Port State Measures (PSM) requirements (e.g. Myanmar and Thailand)	- Sub-regional / bilateral meeting organized - Expected number 16 of participants per meeting (8 persons from each country)	- Meeting report - Number 16 of participants per meeting (8 persons from each country)
Activity 1.4 Information, education and communication materials to support the RFVR Database developed	Information, education and communication materials disseminated	-Number of production and dissemination of the materials
OUTPUT 2	Indicators	Means of Verification
Increased number of fisheries inspectors and strengthened implementation of PSM in Southeast Asia	- Expected number of fisheries officers more than 30 understanding inspection duties of PSM - Smooth implementation of PSM	- Number of fisheries officers more than 30 understanding inspection duties of PSM - PSM in place
Activity 2	Indicators: key inputs (Number to conducted, Where, Time)	Means of Verification
Activity 2.1: Capacity development on port inspection to support the PSM Implementation, and the introduction on the PSM implementation (in general) to non-ratified AMSs	- Capacity development trainings conducted - Number of trainings conducted - Expected number 18 of participants per training	- Training reports - Number of trainings at least 2 time for 5 year - Number of participants at least 36 persons in totally
Activity 2.2: Regional meeting to share information on detecting IUU fishing vessels for preventing the landing of fish and fishery products from IUU fishing vessels at ports in AMSs	- Regional meeting organized - Expected number 18 of participants per meeting	- Meeting report - Number 54 of participants in totally
Activity 2.3: Regional workshop on the review of national legal framework and procedures for the implementation of the PSM, including a gap analysis in the respective legal frameworks of the AMSs (together with 2.1)	- Regional workshop organized - Expected number 18 of participants per meeting - A gap analysis in legal frameworks conducted	- Workshop report - Number of participants at least 36 persons in totally - Gap analysis report
OUTPUT 3	Indicators	Means of Verification
Application of the electronic ASEAN Catch Documentation System (eACDS) to eliminate IUU fisheries products in AMSs	- Application of eACDS to eliminate IUU fisheries products developed - Elimination of IUU fisheries products enhanced through the implementation of eACDS in AMSs	- eACDS applications - Effective actions by AMSs
Activity 3	Indicators: key inputs (Number to conducted, Where, Time)	Means of Verification
Activity 3.1: Continued coordination, facilitation, development and expansion of eACDS in AMSs, particularly for Viet Nam, Malaysia, Myanmar and <i>etc. (in collaboration with MFRDMD)</i>	eACDS further promoted	Implementation of eACDS
Activity 3.2: Regional workshop to exchange	- Regional workshop organized	- Workshop report

GOAL (Overall Objectives)	Indicators	Means of Verification
information on fisheries catch documentation and traceability in AMSs	- Expected number of participants 20 persons per workshop	- Number of participants at least 30 persons in totally
OUTPUT 4	Indicators	Means of Verification
National/regional/international network for collaborative activities to eliminate IUU fishing	Cooperation/collaboration with national/regional/international organizations enhanced	- Number of joint activities - Number of national/regional/international meetings
Activity 4	Indicators: key inputs (Number to conducted, Where, Time)	Means of Verification
Activity 4.1: Coordination with international/regional/national organizations (e.g. FAO, Regional Fisheries Management Organizations (RFMOs), Regional Fisheries Bodies (RFB) and national agencies) in and beyond the region to support AMSs in the implementation of relevant activities to eliminate IUU fishing	- List of international/regional/national organizations to collaborate on eliminating of IUU fishing developed - Number of relevant activities implemented in coordination with international/regional/national organizations - Number of reports or presentations on project activities to eliminate IUU fishing in the international/regional/International forum disseminated	- List of international/regional/national organizations - List of implemented activities - Reports or presentations on project activities
Activity 4.2: Participation in national/regional/international meetings relevant to combating IUU fishing	- Participation of SEAFDEC staff in national/regional/international meetings - Expected number of meetings 1 participation per year	- Meeting reports - Number of meetings at least 5 participation in totally

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Activity 1:																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Activity 1.4																				
Activity 2:																				
Activity 2.1																				
Activity 2.2																				
Activity 2.3																				
Activity 3:																				
Activity 3.1																				
Activity 3.2																				
Activity 4:																				
Activity 4.1																				
Activity 4.2																				

4.3 Activity, Sub-activity and Proposed Budget for 2020-2024

(Unit: USD)

Activity	Sub-Activity	Y1 2020	Y2 2021	Y3 2022	Y4 2023	Y5 2024
Activity 1:	Activity 1.1: Regional Technical Consultation to Improve the Utilization of Regional Fishing Vessel Record 24 meters, and developing the Watch List	20,000	10,000	10,000	10,000	10,000
	Activity 1.2: (Option) National training to promote Regional Fishing Vessels Record Database to AMSs	-	-	-	-	-
	Activity 1.3: (Option) Sub-regional or bilateral meeting to develop the application of RFVR to support the PSM requirements (e.g. Myanmar and Thailand)	-	-	-	-	-
	Activity 1.4 Information, Education and Communication materials to support RFVR Database	-	-	-	-	-
Activity 2:	Activity 2.1: Capacity Building on Port Inspection to Support PSM Implementation and Introduction on the PSM implementation (in general) to non-ratify AMSs	-	20,000	-	20,000	-
	Activity 2.2: Regional Meeting to share information on detecting IUU fishing vessels for preventing the landing of fish and fishery products from IUU fishing vessels at MCs' ports both PSMA ratify and non-ratify MCs.	20,000	-	20,000	-	20,000
	Activity 2.3: Workshop on the review and collect the national legislation and procedures in relation with the implementation of the PSM includes gaps analysis in the respective the legal frameworks of the AMSs (together with 2.1)	-	-	-	-	-
Activity 3:	Activity 3.1: Facilitation and development eACDS for Viet Nam, Malaysia, Myanmar and <i>etc.</i> (in collaboration with MFRDM)	47,000	57,000	57,000	57,000	37,000
	Activity 3.2: Regional Workshop on exchange information on fisheries catch documentation and traceability	-	-	-	-	20,000
Activity 4:	Activity 4.1: Coordination with International organization e.g. FAO, Regional Fisheries Management Organizations (RFMOs), Regional Fisheries Bodies (RFB) and National agencies in and beyond region in order to support AMSs on implementation of activities to eliminate IUU fishing.	-	-	-	-	-
	Activity 4.2: Participation in a national / regional / international meeting relevant to combating IUU fishing activities.	3,000	3,000	3,000	3,000	3,000
Sub-total budget		90,000	90,000	90,000	90,000	90,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 is available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020**1. Project Summary in 2020**

In 2020, the project titled “Strengthening a regional cooperation and enhancing national capacities to eliminate IUU fishing in Southeast Asia” will continue to undertake the activities of Regional Fishing Vessel Record 24 meters in length and over with expanding its activities to less than 24 meters. To support AMSs on implementation of PSM, a regional meeting will be organized to share the information on detecting IUU fishing vessels for preventing the landing of fish and fishery products from IUU fishing vessels at MCs’ ports both PSMA ratified and non-ratified MCs. The project also continues to develop eACDS application for Viet Nam, Malaysia and Myanmar. Moreover, TD will coordinate with MFRDMD to monitor of NPOA IUU including promoting eco-labelling in the region. To further strengthen cooperation with other organizations, enhance capacity development and update information on IUU fishing, the SEAFDEC staff will participate in international/regional meetings/workshops with relevant to IUU fishing.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activity	Description	Proposed Budget
Outcome	Countermeasures to reduce IUU Fishing in Southeast Asia	
Output 1:	Increased number of fisheries inspectors and strengthened implementation of PSM in Southeast Asia	
Activity 1.1: Regional Technical Consultation to Improve the Utilization of Regional Fishing Vessel Record 24 meters, and developing the Watch List	<p>The Regional Technical Consultation to Improve the Utilization of Regional Fishing Vessel Record 24 meters, and developing the Watch List will organized in Thailand, aims to develop RFVR database for less than 24 meters in collaboration with AMSs. The update information of RFVR database 24 meter in length and over also will discussed through introduce “Watch List” which suggested by Council in the Council Meeting in 2019. Two participants who is Nation Focal Point for RFVR and Policy level from each country will be invited to participate in the RTC.</p> <p><i>Estimation budget</i></p> <ul style="list-style-type: none"> • Airfare and transportaton (20 persons) 5,500 USD • Accommodation (4 night) 4,800 USD • DSA (3 days) 4,200 USD • Meeting package and etc. 5,500 USD 	20,000
Output 2:	Increased number of fisheries inspectors and strengthened implementation of PSM in Southeast Asia	
Activity 2.2: Regional Meeting to share information on detecting IUU fishing vessels for preventing the landing of fish and fishery products from IUU fishing vessels at MCs’ ports both PSMA ratify and non-ratify MCs	<p>The Regional Meeting to share information on detecting IUU fishing vessels for preventing the landing of fish and fishery products from IUU fishing vessels at MCs’ ports both PSMA ratify and non-ratify MCs will organized in Thailand and invite 2 representatives from MCs who engage to PSM activities in operation and manager/policy level to participate in the Meeting through invite other relevant international organization. The Meeting aims to update need and obstacle to implement PSM in the region.</p> <p><i>Estimation budget</i></p> <ul style="list-style-type: none"> • Airfare and transportation (20 persons) 5,500 USD • Accommodation (4 night) 4,800 USD • DSA (3 days) 4,200 USD • Meeting package and etc. 5,500 USD 	20,000
Output 3	Application of the electronic ASEAN Catch Documentation System (eACDS) to eliminate IUU fisheries products in AMSs	

Proposed Activity	Description	Proposed Budget
Activity 3.1: Facilitation and development eACDS for Viet Nam, Malaysia and Myanmar.	SEAFDEC/TD will continue to facilitate and improve eACDS application for Viet Nam, Malaysia and Myanmar through organize training on the use of eACDS application to relevant target groups <i>Viet Nam</i> • Airfare and transportation (4 prs) 2,900 USD • Accommodation (4 nights) 1,120 USD • DSA (5 days) 1,000 USD • Meeting cost and etc. 1,980 USD Total 7,000 USD Grand Total for 2 times 14,000 USD <i>Malaysia</i> • International and transportation (4 prs.) 2,700 USD • Accommodation (4 nights) 1,280 USD • DSA (5 days) 1,400 USD • Meeting cost and etc. 1,620 USD Total 7,000 USD Grand Total for 3 times 21,000 USD <i>Myanmar</i> • Airfare and transportation (4 prs.) 2,300 USD • Accommodation (3 nights) 840 USD • DSA (5 days) 1,000 USD • Training cost and etc. 1,860 USD Total 6,000 USD Grand total for 2 times 12,000 USD	47,000
Output 4	National/ regional/ international network for collaborative activities to eliminate IUU fishing	
Activity 4.2: Participation in a national / regional / international meeting relevant to combating IUU fishing activities	To cooperation with other organization and also capacity building and update information on relevant of IUU trend, the project staff will participate in international meeting/ workshop with relevant to combat IUU fishing topic. • Airfare and transportation 1,010 USD • Accommodation (3 nights) 210 USD • DSA (4 days) 280 USD Total 1,500 USD Grand total for 2 times 3,000 USD	3,000

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1.1												
Activity 2.2												
Activity 3.1												
Activity 4.2												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
<i>Activity 1: Regional Fishing Vessels Record (RFVR)</i>	
Activity 1.1 Regional Technical Consultation to Improve the Utilization of Regional Fishing Vessel Record 24 meters, and developing the Watch List, aims to develop RFVR database for less than 24 meters in collaboration with AMSs. The update information of	<ul style="list-style-type: none"> • Development of RFVR less than 24 meters • Update information on RFVR 24 meters and over • Agreement from AMSs to initiate Watch list • Strategy and way forward for RFVR Database

Planned activity	Expected Activity Results
<p>RFVVR database 24 meter in length and over also will discussed through introduce “Watch List” which suggested by Council in the Council Meeting in 2019. Two participants who is Nation Focal Point for RFVVR and Policy level from each country will be invited to participate in the RTC.</p>	
<i>Activity 2: Regional Cooperation to support implementation of PSM</i>	
<p>Activity 2.2 Regional Meeting to share information on detecting IUU fishing vessels for preventing the landing of fish and fishery products from IUU fishing vessels at MCs’ ports both PSMA ratify and non-ratify MCs will organized in Thailand and invite 2 representatives from MCs who engage to PSM activities in operation and manager/policy level to participate in the Meeting through invite other relevant international organization. The Meeting aims to update need and obstacle to implement PSM in the region.</p>	<ul style="list-style-type: none"> • Sharing information on detecting IUU fishing vessels for preventing the landing of fish and fishery products from IUU fishing vessels • Needs and obstacles of AMSs to support implementation of PSM • Cooperation between partners to support implementation of PSM in ASEAN • Way forward of SEAFDEC to support AMSs to implement PSM
<i>Activity 3: Electronic ASEAN Catch Documentation Scheme (eACDS)</i>	
<p>Activity 3.1 Facilitation and development eACDS for Viet Nam, Malaysia and Myanmar. SEAFDEC/TD will continue to facilitate and improve eACDS applicaton for Viet Nam, Malaysia and Myanmar through organize training on the use of eACDS application to relevant target groups</p>	<ul style="list-style-type: none"> • Development and improvement of eACDS in Viet Nam, Malaysia, and Myanmar • Understanding of the use of eACDS application for relevant user
<i>Activity 4: Strengthen on Coordination with international/regional/national organizations</i>	
<p>Activity 4.2 Participation in a national / regional / International meeting relevant to combating IUU fishing activities. To cooperation with other organization and also capacity building and update information on relevant of IUU trend, the project staff will participate in international meeting/ workshop with relevant to combat IUU fishing topic.</p>	<ul style="list-style-type: none"> • Strengthen network and partner to combat IUU fishing • Cooperation with partner to combat IUU fishing in the region • Sharing information and promote on combating IUU fishing activities that conduct in the ASEAN

PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

			Project ID: 202006007
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Harmonization and Enhancing Utilization of Fishery Statistics and Information		
Program Strategy No:	I	Total Period	2020 - 2024
Lead Department:	Secretariat (SEC)	Lead Country:	To be identified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 230,000
Project Partner(s):	FAO	Budget for 2020:	USD 54,000
Lead Technical Officer:	Saivason Klinsukhon, Senior Information Officer / SEC	Project Participating Country(ies):	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

Fishery statistics and information are essential for policy planning and management of fisheries toward the sustainability. This project therefore focuses on supporting the on-going efforts of SEAFDEC in the regional compilation of fishery statistics in AMSs, taking into consideration of the newly agreed statistics standards developed and recently adopted by FAO in 2019. This would ensure that fishery statistics submitted by AMSs for the regional compilation comply with the requirements at global level.

In addition to fishery statistics, the project supports the utilization of various data and information to generate information that could provide better knowledge on the status and trends of fisheries and aquaculture in the region. The information on fishery and aquaculture related issues confronted in the region would be published in the third issue of the publication “Southeast Asian State of Fisheries and Aquaculture (SEASOFIA)” produced by SEAFDEC every 5-year (first issue in 2012, second in 2017, and third in 2022). Furthermore, the project would support enhancing the visibility of SEAFDEC initiatives undertaken through SEAFDEC programs and projects, which would be also published in the SEAFDEC Special Publication “Fish for the People” (three issues per year, since 2002).

2. Background and Justification

SEAFDEC has been undertaking initiatives in compiling fishery statistics from the Member Countries bordering the South China Sea Areas since 1978. Harmonization of data is an important issue in order to facilitate the exchange and compilation of statistics at various levels, *i.e.* regional and international levels. SEAFDEC developed the “Regional Framework for Fishery Statistics of Southeast Asia”, *i.e.* on the “standard definitions and classifications” to be harmonized with the international standards and on “area of coverage” and “statistical usage” to be consistent with the areas of competence of SEAFDEC. The Framework has been using for the compilation of fishery statistics from the Southeast Asian countries to SEAFDEC since 2008.

Nevertheless, after 2008, there are still more development of new standards by the Coordinating Working Party (CWP) on Fishery Statistics. In August 2017, SEAFDEC organized the “Regional Technical Consultation (RTC) on Fishery Statistics and Information in Southeast Asia”, where the Southeast Asian countries were updated with the recent development by the CWP of new global frameworks related to fishery statistics. During the RTC, the initial recommendations were provided to the participants on the new CWP standards. It was agreed that after the adoption of the new CWP standards (*i.e.* at the 26th Session of the Coordinating Working Party (CWP) on Fishery Statistics in 2019), SEAFDEC should organize a meeting among the members of the ASEAN Network on Fishery Statistics to revise the Regional Framework for Fishery Statistics of Southeast Asia. Other areas for improving regional fishery statistics were also discussed and agreed upon during the RTC, *e.g.* inclusion of statistics on fish trade and fish processing. This project is planned to support for revising the Regional Framework for Fishery Statistics for Southeast Asia with the new global frameworks related to fishery statistics, as well as inclusion of other areas that are important to provide information on the status of the fisheries sector in the region. “Fish for the People” which would be incorporated under this project.

In addition, SEAFDEC published its publications entitled “Southeast Asian State of Fisheries and Aquaculture (SEASOFIA)” in 2012 and 2017, aiming to make use of statistics, other data and information to provide better understandings on the fisheries sector of the region. In order to continue the momentum of enhancing the utilization of fishery statistics, this project would facilitate the preparation and production of the next SEASOFIA in 2022. Furthermore, there is also a need to sustain the initiative in production of Special Publication

3. Gender Sensitivity of the Project

The nature of project implementation in general is not gender sensitive; however, the revised Regional Framework for Fishery Statistics of Southeast Asia and SEASOFIA 2022 could incorporate the gender aspect in the activity.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives)	Indicators	Means of Verification
Utilization of fishery statistics data and information for policy planning and management of fisheries toward sustainability	Fishery statistics data and information on the status and trends served as references for policy planning and fisheries management	- Number of references made to the Fishery Statistics Bulletin, SEASOFIA 2022, and “Fish for the People” - Number of downloads of the three publications from the SEAFDEC repositories
OUTCOME	Indicator	Means of Verification
SEAFDEC fishery statistics data improved in line with the revised Regional Framework for Fishery Statistics of Southeast Asia	Data items reported based on the revised Regional Framework for Fishery Statistics of Southeast Asia	Number of data items reported by AMSs for the SEAFDEC Statistics Bulletin
OUTPUT 1	Indicators	Means of Verification
Regional Framework for Fishery Statistics of Southeast Asia revised	Revised Regional Framework for Fishery Statistics of Southeast Asia is harmonized with the new global standards	Adoption of the Regional Framework by AMSs
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: Monitoring the development of global fishery statistics standards and participation in the relevant fora in the development and finalization of global frameworks on fishery statistics	SEAFDEC staff participated in the relevant international meetings (<i>e.g.</i> FAO CWP on Fishery Statistics), and information on regional standards shared	Meeting reports

GOAL (Overall Objectives)	Indicators	Means of Verification
<p>Activity 1.2: Regional Technical Consultation(s) to gather inputs for revising the Regional Framework for Fishery Statistics of Southeast Asia</p> <p><i>Remarks: A series of RTC to be organized to update the Statistics Framework: Year 1: Overall workplan, Part of General Note, Marine and Inland Capture Production, and Export and Import of Fishery Commodities Year 2: Part of Aquaculture and Producer Price Year 4: Finalizing the revision of regional framework Year 5: Monitoring the new questionnaires</i></p>	<ul style="list-style-type: none"> - Regional Technical Consultation organized - Revised Regional Framework drafted - Expected number (40 persons) of participants 	<ul style="list-style-type: none"> - Consultation report(s) - Number of global standards accommodated in the revised Regional Framework - Revised Regional Framework (draft) - Number (40 persons) of participants
<p>Activity 1.3: Production and dissemination of the revised Regional Framework for Fishery Statistics of Southeast Asia</p>	<p>The revised Regional Framework published and disseminated in 2024</p>	<p>Number of production and dissemination of the revised Regional Framework</p>
OUTPUT 2	Indicators	Means of Verification
<p>Latest information on the status and trends of fisheries and aquaculture in the region disseminated to the public through the SEAFDEC publication “Southeast Asian State of Fisheries and Aquaculture 2022 (SEASOFIA 2022)”</p>	<p>SEASOFIA 2022 published as reference material on the status and trends of fisheries and aquaculture in the region</p>	<p>SEASOFIA 2022</p>
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
<p>Activity 2.1: Consultations among SEAFDEC Departments to develop the outline and identify contributors for SEASOFIA 2022</p>	<p>The Consultation conducted in 2020</p>	<ul style="list-style-type: none"> - Consultation reports - Outlines of SEASOFIA 2022
<p>Activity 2.2: Development of input articles and consultations for finalizing the articles for SEASOFIA 2022</p>	<p>Consultations conducted in 2021 to finalize draft articles</p>	<ul style="list-style-type: none"> - Consultation reports - Draft articles for SEASOFIA 2022
<p>Activity 2.3: Production and dissemination of SEASOFIA 2022</p>	<p>SEASOFIA 2022 published and disseminated in 2022</p>	<p>Number of production and dissemination of SEASOFIA 2022</p>
OUTPUT 3	Indicators	Means of Verification
<p>Information on fisheries issues and relevant regional initiatives disseminated to public through the SEAFDEC publication “Fish for the People”</p>	<p>Information on fisheries issues and relevant regional initiatives disseminated</p>	<p>SEAFDEC publication “Fish for the People”</p>

GOAL (Overall Objectives)	Indicators	Means of Verification
ACTIVITY 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 3.1: Preparation, production and dissemination of the publication “Fish for the People”	“Fish for the People” published and disseminated in three times per year (April, August and December)	Number of production and dissemination of “Fish for the People”

4.2 Project Implementation Plan for 2020-2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1:																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Output 2:																				
Activity 2.1																				
Activity 2.2																				
Activity 2.3																				
Output 3:																				
Activity 3.1																				

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)
Output 1	Activity 1.1	4,000	4,000	4,000	4,000	4,000
	Activity 1.2	25,000	25,000	-	25,000	25,000
	Activity 1.3	-	-	-	-	5,000
Output 2	Activity 2.1	10,000	-	-	-	-
	Activity 2.2	-	10,000	-	-	-
	Activity 2.3	-	-	10,000	-	-
Output 3	Activity 3.1	15,000	15,000	15,000	15,000	15,000
Sub-Total		54,000	54,000	29,000	44,000	49,000

PART II: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, SEAFDEC will continue to coordinate with Member Countries and relevant organizations including the participation in relevant regional/international fora to keep up with the new development in relation to fishery statistics. Specifically, FAO has made a significant progress in developing several new standards and definitions on fishery statistics in the past few years. Therefore, the 1st Regional Technical Consultation will be organized under this project to keep the AMSs informed of such development and to seek views from AMSs on the workplan for updating the Regional Framework of Fishery Statistics in Southeast Asia accordingly, as well as to

discuss some areas for improvement/incorporation in the Fishery Statistics Bulletin. In preparation for the third issue of SEASOFIA in 2022 (after the first in 2012 and the second in 2017), SEAFDEC will focus on the development of the outlines of the publication in 2020 in consultation with the SEAFDEC Departments as main contributors of the publication. The draft outlines will be submitted to the 43rd PCM in 2020 for consideration. Furthermore, three issues of Special Publication “Fish for the People” will be produced and disseminated in the year 2020 to promote initiatives and activities undertaken by SEAFDEC to the wide audience.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome	SEAFDEC fishery statistics data improved in line with the revised Regional Framework for Fishery Statistics of Southeast Asia	
Output 1	Regional Framework for Fishery Statistics for Southeast Asia revised	
Activity 1.1	<p>Participation in the relevant fora in relation to development and finalization of global frameworks on fishery statistics</p> <p><i>SEAFDEC will participate in the international/regional fora to be updated on the development of global frameworks related to fishery statistics, and to support the revision of the Regional Framework of Fishery Statistics for Southeast Asia with the new global frameworks.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 2,300 • <i>Daily subsistence allowance</i> = US\$ 700 • <i>Accommodation</i> = US\$ 800 • <i>Others</i> = US\$ 200 	4,000
Activity 1.2	<p>Conduct of Regional Technical Consultation to gather inputs for revision of the Regional Framework for Fishery Statistics for Southeast Asia</p> <p><i>The First RTC will be conducted with the participation of representatives from the ASEAN Member States to seek views and inputs for updating the Regional Framework of Fishery Statistics in Southeast Asia, particularly on the part of General Note, Marine and Inland Capture Production, and Export and Import of Fishery Commodities. It is expected that the revision of the statistics frameworks would enhance regional and global compilation of future fishery statistics in the future.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> <i>Traveling cost</i> = US\$ 7,000 <i>(1 prs. from each AMS and 1 prs. from each SEAFDEC Department)</i> <i>Daily subsistence allowance</i> = US\$ 7,000 <i>Accommodation</i> = US\$ 6,000 <i>Meeting package (40 prs.)</i> = US\$ 3,800 <i>Others</i> = US\$ 1,200 <p><i>Remarks: RTC will be organized in Thailand (3 days)</i></p>	25,000
Output 2	SEAFDEC publication “Southeast Asian State of Fisheries and Aquaculture 2022”	
Activity 2.1	<p>Conduct of consultation among SEAFDEC Departments to develop outline and identify contributors</p> <p><i>The Consultation will organize with the participation of SEAFDEC Departments with the aims to develop the outline of SEASOFIA2020 to reflect important fishery-related issues, and contributors for the publication before submission to 43PCM and Department Chiefs’ Meeting for consideration.</i></p> <p><i>Estimated expenditures:</i></p>	10,000

Proposed Activities	Descriptions	Proposed Budget
	<ul style="list-style-type: none"> Traveling cost = US\$ 4,000 (1 prs. from each SEAFDEC Department) Daily subsistence allowance = US\$ 2,500 Accommodation = US\$ 2,000 Meeting package (30 prs.) = US\$ 1,000 Others = US\$ 500 <p>Remarks: Consultation will be organized in Indonesia (back to back with the 21st ISP Meeting)(1 day Meeting)</p>	
Output 3	SEAFDEC publication “Fish for the People”	
Activity 3.1	<p>Preparation, production and dissemination of publication on Fish for the People</p> <p>Three issues of SEAFDEC Special Publication “Fish for the People” will be produced and disseminated</p> <p>Estimated expenditures:</p> <ul style="list-style-type: none"> Printing (3 issues) = US\$ 11,000 Mailing = US\$ 4,000 	15,000

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.2												
Output 2:												
Activity 2.1												
Output 3:												
Activity 3.1												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Activity 1. Monitoring of development of global fishery statistics standards and conduct regional for a to discuss on harmonization of Regional Framework for Fishery Statistics for Southeast Asia	
Activity 1.1. Participation in the relevant fora in relation to development and finalization of global frameworks on fishery statistics	<ul style="list-style-type: none"> Strengthened coordination between SEAFDEC and Member Countries and organizations on statistics-related matters Updated on the recent development by the CWP of new global frameworks related to fishery statistics
Activity 1.2. Conduct of Regional Technical Consultation to gather inputs for revision of the Regional Framework for Fishery Statistics for Southeast Asia	<ul style="list-style-type: none"> The revision part of General Note, Marine and Inland Capture Production, and Export and Import of Fishery Commodities for the Regional Framework of Fishery Statistics for Southeast Asia
Activity 2. Preparation and production of publication “Southeast Asian State of Fisheries and Aquaculture 2022”	
Activity 2.1. Conduct of consultation among SEAFDEC Departments to develop outline and identify contributors	<ul style="list-style-type: none"> Outline of the publication “SEASOFIA 2022”
Activity 3. Preparation and production of publication “Fish for the People”	
Activity 3.1. Preparation, production and dissemination of publication on Fish for the People	<ul style="list-style-type: none"> Three issues of Special Publication “Fish for the People” produced and disseminated.

PROJECT DOCUMENT

PROPOSED ACTIVITY FOR YEAR 2020

			Project ID: 202001013
Program Categories:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Responsible Fishing Technology and Practice		
Strategy:	I	Total Duration:	2020 - 2024
Lead Department:	Training Department (TD)	Lead Country:	To be identified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Donor Budget:	USD 300,000
Project Partner:	None	Budget for 2020:	USD 60,000
Project leader:	Mr. Taweekiet Amornpiyakrit (TD)	Involved Country:	All Members Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Executive Summary

To meet the needs of responsible fishing technology and practices in the region, SEAFDEC has promoted series of the selective fishing devices such as ‘Turtle Excluder Devices (TEDs)’ for shrimp trawling, to ensure harmless catch of marine turtles and to release them safely and properly since 1998. Subsequently, in 2000, SEAFDEC has continued to promote the use of the ‘Juvenile and Trash Fishes Excluder Devices (JTEDs) in trawl fisheries and circle hooks in tuna longlining to address the problems on releasing juveniles and immature fish and to selectively harvest the target catch while reducing the level of unwanted catch in form of juveniles and immature and trash fish. During 2012-2015 SEAFDEC had collaborated with FAO to implement project Strategies for Trawl Fisheries By-catch Management and project Conducting Energy Audits for Thai Trawler in 2015. SEAFDEC is continuing to promote the sustainable utilization of marine and coastal fisheries resources and the ecosystems to avoid significant adverse impacts. The utilization of marine resources by application of the environmentally friendly fishing gear and practices should be further developed and applied in order to enhance marine biodiversity and to secure fish for the people as well as to improve ocean health of the SEAFDEC Member Countries. Furthermore, taking into consideration, the efforts to prevent and significantly reduce marine debris will be exerted. In addition, most of the capture methods used for fishing is, however, heavily depending on the utilization of fossil fuels or petroleum. For many important fisheries, the high consumption of fuel constitutes a major constraint to their economic viability but also represents a significant source of greenhouse gas emissions. In general, active fishing gear like trawls and dredges can greatly impact the environment and more amounts of fuel required than other passive fishing gear as traps and hooks or other stationary fishing gear.

To facilitate the adoption of the concept *Low Impact and Fuel Efficient (LIFE) Fishing* as responsible fishing technology, the SEAFDEC Training Department (TD) would apply technological improvements (e.g. LED in light fishing, Marking of fishing gear, Deck machinery and its auxiliary devices) for the appropriate fishery machinery onboard fishing vessels over the traditional fishing vessels. With such technological improvements, the changes in behavior and fishing practices can greatly result in more responsible fishing manners, mitigating damages to aquatic ecosystems, reducing emissions and lowering fuel costs, and contribute to more economical and sustainable utilization of fisheries resources and to better human well-being and livelihood of the fisherfolks in the Southeast Asian region.

Through technical meeting/workshop/survey/research/study, the project aims to; 1) promote responsible fishing technology and practices to mitigate fishing impacts to marine ecosystem, 2) promote marine engineering technologies and their applicability on enhancing the capability of fuel consumption efficiency and safety in fishing operations, and 3) enhance human resource capacities on fish handling techniques onboard fishing vessels. It is also envisaged that the fishing and marine engineering technologies will be improved at national and regional levels as well as enhanced in human resources capacities in the Southeast Asian region.

2. Background and Justification

Southeast Asia is one of the world's most biologically diverse, economically productive and potentially vulnerable marine zones. The fishery production in the region exhibited a continuously increasing trend in terms of volume in 2012-2016. Marine fisheries greatly contribute to high quality seafoods and create employment and income for livelihood of the fisherfolks, specifically in marine capture fisheries. Presently, marine fisheries resources in the Southeast Asian region are heavily exploited. It is vital that marine resources must be harvested responsibly and sustainably, and the future fisheries development is governed by the availability of sustainable fish stock. Indisputably, fishing activities can sometimes adversely impact the marine environments through excessive removals of ecologically and economically valuable species, and also by a direct physical contact with critical habitats, *e.g.* bottom trawls. In addition, most of the capture methods used for fishing is, however, heavily depending on the utilization of fossil fuels or petroleum. For many important fisheries, the high consumption of fuel constitutes a major constraint to their economic viability but also represents a significant source of greenhouse gas emissions. In general, active fishing gear like trawls and dredges can greatly impact the environment and more amounts of fuel required than other passive fishing gear as traps and hooks or other stationary fishing.

In line with the drafted Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 and corresponding the United Nations' Sustainable Development Goals 14 (Life Below Water: Conserve and sustainably use the oceans, seas and marine resources), SEAFDEC maintains its continuation in promoting the sustainable utilization and protection of marine and coastal fisheries resources and the ecosystems to avoid significant adverse impacts. The utilization of marine resources and environmentally friendly fishing gear and practices should be further developed and applied in order to maintain biodiversity and to secure fish for the people as well as to improve ocean health and to enhance the contribution of marine biodiversity to the development of the SEAFDEC Member Countries. Furthermore, taking into consideration, the efforts to prevent and significantly reduce marine debris will be exerted.

The program of activities under this project will be implemented based upon the current situation on the environmental impact of fishing gear and practices in the Southeast Asian region and national activities to mitigate those impacts to the marine ecosystem. The program of activities also includes research studies and the application and modification of marine engineering technologies on enhancing capability of fuel consumption efficiency and safety in fishing operations, reducing the emission of green-house gas and enhancing the safety-at-sea in fishing operations. Regional technical consultations and meetings along with the field practices will be periodically conducted to update the situation, share experiences, monitor the project implementation with the Member Countries. Network establishment towards the national initiatives to improve/apply the fishing technologies for supporting fisheries management will be also made.

The project will be implemented by SEAFDEC/TD in collaboration with responsible national agencies of the Member Countries, relevant organizations, institutions and other international partnerships (*e.g.* FAO, UN Environment, GEF, etc.) at both regional and national levels. Human resource development through the staff exchange, expert dispatchment and participation in the relevant meetings/workshops will be conducted.

3. Gender Sensitivity of the Project

The project will blend knowledge, skill and experience of senior researchers with the innovative idea of junior researchers to apply new/modern technologies to the project. Project involves men and women with neutral and equalized.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives)	Indicators	Means of Verification
Sustainable utilization and sound management to minimize impact of fisheries resources and marine ecosystem by strengthening responsible fishing technology and practice in Southeast Asia	Proportion of SEAFDEC Member Counties managed their fisheries by application of technologies to reduce impact in fishing technologies, optimized fuel consumption, enhance safety on fishing operation and handling techniques onboard fishing vessel	Report of the technologies to reduce impact in fishing technologies, optimized fuel consumption, safety on fishing operation and handling techniques onboard fishing vessel, presented in the Regional Technical Meeting
OUTCOME	Indicator	Means of Verification
Strategic actions for improving low impact fishing technologies are promoted by Governments and other stakeholders	Fisheries management by introducing technologies to reduce impact in fishing technologies, optimized fuel consumption, safety on fishing operation and handling techniques onboard fishing vessel	Fisheries regulation or measure apply technologies to reduce impact in fishing technologies, optimized fuel consumption, safety on fishing operation and handling techniques onboard fishing vessel, presented in the Regional Technical Meeting
OUTPUT 1	Indicators	Means of Verification
Fishing technologies (<i>i.e.</i> fishing gear, fishing accessories, fishing practice) improved at national and regional level to reduce negative impacts to marine ecosystem	<ul style="list-style-type: none"> - At least 3 Member Countries (MCs) have activities, research/training, by introducing of concept Low Impact and Fuel Efficient (LIFE) fishing technologies in their fishing operations in 5 years. - IFCOME network to follow up the national initiative to improve/apply low impact fishing technologies to support fisheries management 	<ul style="list-style-type: none"> - Report of the research or training activities/programs developed and conducted in SEAFDEC MCs and presented in the Regional Technical Meeting. - Report on the research or study on the fishing technologies (<i>i.e.</i> fishing gear, fishing accessories, fishing practice) improved at national and regional level to reduce negative impacts to marine ecosystem - Number (60 persons) of fishing gear technologists will be members of IFCOME network
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: Regional Technical Meeting to identify and information gathering of environmental impacts fishing gear and practices in Southeast Asia and national activities/legislation to reduce/mitigate impacts of fishing gear and practices to marine ecosystem	<ul style="list-style-type: none"> - Inception meeting on the Regional Technical Meeting to identify and information gathering of environmental impacts fishing gear and practices in Southeast Asia and national activities/ legislation to reduce/mitigate impact of impacts fishing gear and practices to ecosystem - Project end-meeting on the Regional Technical Meeting to identify and information gathering of environmental impacts fishing gear and practices in Southeast Asia and national activities/ legislation to reduce/mitigate impact of impacts fishing gear and practices to ecosystem 	<ul style="list-style-type: none"> - Meeting report(s) on the Regional Technical Meeting - Three (3) Member Countries (MCs) have activities, research/ training, by introducing of concept Low Impact and Fuel Efficient (LIFE) fishing technologies in their fishing operations in 5 years - Number (60 persons) of fishing gear technologists will be member of IFCOME network. List of them are appear in the Regional Technical Meeting reports.

GOAL (Overall Objectives)	Indicators	Means of Verification
Activity 1.2: Research/study/survey on the appropriate technique to reduce/mitigate environmental impacts of fishing gear and practices to marine ecosystem	Two (2) Research/study/survey on the appropriate technique to reduce/mitigate environmental impacts of fishing gear and practices to marine ecosystem, <i>e.g.</i> light fishing, stationary fishing gear, marking of fishing gear, etc.	- Scientific reports on the techniques to mitigate the environmental impacts of fishing gear and practices to marine ecosystem - Publication in journal or magazine
Activity 1.3: Human resources development on techniques to reduce bycatch and discards, and mitigate impacts to habitat and vulnerable species	Regional technical training / workshop on techniques to reduce bycatch and discards, and mitigate impacts to habitat and vulnerable species	- Report on the regional technical training / workshop on techniques to reduce bycatch and discards, and mitigate impacts to habitat and vulnerable species - Number of participants of SEAFDEC Member Countries participated in the meeting - Series of publication used in regional technical training
Activity 1.4: Information dissemination on the fishing techniques, <i>i.e.</i> fishing gear, fishing accessories and fishing practices, to reduce bycatch and discards, and mitigate impacts to vulnerable species	Publication on the Regional technical meeting or training, research study and report on the fishing gear, fishing accessories and fishing practices, to reduce bycatch and discards, and mitigate impacts to vulnerable species	- Series of publication on the fishing techniques, <i>i.e.</i> fishing gear, fishing accessories and fishing practices, to reduce bycatch and discards, and mitigate impacts to vulnerable species to disseminate through SEAFDEC website. - Presentation or abstract or scientific paper presented in the national regional or international symposium/conference
OUTPUT 2	Indicators	Means of Verification
Marine engineering technologies (<i>i.e.</i> fuel efficiency, and greenhouse gas reduction and safety of fishing operation at sea) improved at national and regional level	- At least 3 MCs have research/training activities on marine engineering techniques to improve fuel utilization and safety in fishing operation - Sixty (45) fisheries officers has been trained on the marine engineering techniques to improve fuel utilization and safety in fishing operation	Report in the project end meeting on the Regional Technical Meeting on the fuel consumption and/or safety in fishing operation in Southeast Asia
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 2.1: Regional technical meeting on information gathering of the fuel consumption in fishing operation and/or safety on fishing operation of major fishing operation in Southeast Asia (2020 and 2024)	- Inception meeting on the Regional Technical Meeting on the fuel consumption and/or safety in fishing operation in Southeast Asia in 2020 - Project end meeting on the Regional Technical Meeting on the fuel consumption and/or safety in fishing operation in Southeast Asia in 2024	- Report on the regional technical meetings - Number (60 persons) of Marine engineer will be member of IFCOME network

GOAL (Overall Objectives)	Indicators	Means of Verification
Activity 2.2: Research/study/survey on the appropriate technique to manage the fuel consumption, carbon emission and/or safety on fishing operation	Two (2) Research/study/survey on the appropriate technique to manage the fuel consumption and/or safety in fishing operation	<ul style="list-style-type: none"> - Report on the regional technical training / workshop on techniques to reduce bycatch and discards, and mitigate impacts to habitat and vulnerable species - Number of participants of SEAFDEC Member Countries participated in the meeting - Series of publication used in regional technical training
Activity 2.3: Human resources development on techniques to manage the fuel consumption, carbon emission and/or safety on fishing operation	One (1) Regional technical training / workshop on techniques to manage the fuel consumption, carbon emission and/or safety on fishing operation	<ul style="list-style-type: none"> - Report on the regional technical training / workshop on techniques to manage the fuel consumption, carbon emission and/or safety on fishing operation - Number of participants of SEAFDEC Member Countries-participated in the training/workshop - Series of publication used in regional technical training/ workshop
Activity 2.4: Information dissemination on techniques to manage the fuel consumption, carbon emission and/or safety on fishing operation	Publication or report on the regional technical meeting, training, research study on the techniques to manage the fuel consumption, carbon emission and/or safety on fishing operation	<ul style="list-style-type: none"> - Series of publication on the fishing techniques, <i>i.e.</i> fuel consumption, carbon emission and/or safety on fishing operation - Presentation in the national regional or international symposium/conference
OUTPUT 3	Indicators	Means of Verification
Regional and national human resources in fish handling techniques onboard fishing vessels improved	<ul style="list-style-type: none"> - At least 3 MCs will be promoted fish handling onboard fishing vessel and drafting the training program in their fisheries. - Sixty (60) fisheries officers has been trained applicable fish handling on board fishing vessel training package for promotion in SEAFDEC MCs 	Report in the project end meeting.
ACTIVITY 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 3.1: human resource development on fish handling techniques onboard fishing vessels (Trainer level)	Three (3) regional training of trainers (ToT) on fish handling techniques onboard fishing vessels	<ul style="list-style-type: none"> - Report on the regional training of trainers (ToT) on fish handling techniques onboard fishing vessels - Number of participants of SEAFDEC Member Countries participated in the training/workshop - Series of publication used in regional technical training/ workshop

GOAL (Overall Objectives)	Indicators	Means of Verification
Activity 3.2: Human resource development on fish handling techniques onboard fishing vessels (National Scale)	Two (2) National training courses on the fish handling onboard fishing vessels	- Report on the regional training of trainers (ToT) on fish handling techniques onboard fishing vessels - Number of participants of SEAFDEC Member Countries participated in the training/workshop - Series of publication used in regional technical training/workshop
Activity 3.3: Information dissemination on fish handling techniques onboard fishing vessels	P3publication on the Regional technical meeting or training report.	- Series of publication on the fishing techniques, <i>i.e.</i> fuel consumption, carbon emission and/or safety on fishing operation - Presentation in the national regional or international symposium/conference

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1:																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Activity 1.4																				
Output 2:																				
Activity 2.1																				
Activity 2.2																				
Activity 2.3																				
Activity 2.4																				
Output 3:																				
Activity 3.1																				
Activity 3.2																				
Activity 3.3																				

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)
Output 1	Activity 1.1	20,000	-	-	-	20,000
	Activity 1.2	-	20,000	20,000	-	-
	Activity 1.3	-	-	-	20,000	-
	Activity 1.4	(Budget with Activity 1.1)	(Budget with Activity 1.2)	(Budget with Activity 1.2)	(Budget with Activity 1.3)	(Budget with Activity 1.1)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)
Output 2	Activity 2.1	20,000	-	-	-	20,000
	Activity 2.2	-	20,000	20,000	-	-
	Activity 2.3	-	-	-	20,000	-
	Activity 2.4	(Budget with Activity 2.1)	(Budget with Activity 2.2)	(Budget with Activity 2.3)	(Budget with Activity 2.4)	(Budget with Activity 2.1)
Output 3	Activity 3.1	20,000	-	20,000	-	20,000
	Activity 3.2	-	20,000	-	20,000	-
	Activity 3.3	(Budget with Activity 3.1)	(Budget with Activity 3.2)	(Budget with Activity 3.1)	(Budget with Activity 3.2)	(Budget with Activity 3.1)
Sub-Total		60,000	60,000	60,000	60,000	60,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 is available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

This newly developed project on ‘Responsible Fishing Technology and Practice’ would focus on the emerging issues and priority needs of the Southeast Asian region to address fishing impacts to the marine ecosystem as well as to promote marine engineering technologies and applicability on enhancing the capability of fuel consumption efficiency and safety-at-sea in fishing operations.

In 2020, two (2) regional technical meetings would be organized to identify and gather information on environmental-impacted fishing gear and practices to the marine ecosystem in the region, and to gather information on the fuel consumption and safety in fishing operations in the region *e.g.* trawl, purse seine, etc. It is expected that these two regional technical meetings would come up with the updated information, recommendations and way forwards from respective Member Countries on the existing situation of the fishing impacts and activities/legislation to mitigate the impacts of fishing gear and practices to the marine ecosystem as well as existing technology to improve the fuel consumption efficiency and safety on fishing operations. The obtained information and shared experiences in the meeting would be necessary for formulating project proposals in response to the needs of the Member Countries in the following years. A regional and/or national training aimed for trainers on fish handling techniques onboard fishing vessels will be also organized to enhance skills and experiences of the trainers in 2020.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Output 1: Fishing technologies (<i>i.e.</i> fishing gear, fishing accessories, fishing practice) improved at national and regional level to reduce negative impacts to marine ecosystem	Selection criteria/ recommendations to improve low negative impact fishing technologies (<i>i.e.</i> fishing gear, fishing accessories, fishing practice) at least 2 project areas/countries	
Activity 1.1	Regional Technical Meeting to identify and information gathering of environmental impacts fishing gear and practices in Southeast Asia and national activities/legislation to reduce/mitigate impacts of fishing gear and practices to marine ecosystem (Year 2020; 20,000 USD) <i>Estimated expenditures:</i> ▪ <i>Traveling cost</i> = US\$ 5,500	20,000

Proposed Activities	Descriptions	Proposed Budget
	<ul style="list-style-type: none"> ▪ DSA = US\$ 5,000 ▪ Accommodation = US\$ 5,500 ▪ Others = US\$ 4,000 	
Activity 1.4	Information dissemination on the fishing techniques, <i>i.e.</i> fishing gear, fishing accessories and fishing practices, to reduce bycatch and discards, and mitigate impacts to vulnerable species	Shared with Activities 1.1,
Output 2: Marine engineering technologies (<i>i.e.</i> fuel efficiency, and greenhouse gas reduction and safety of fishing operation at sea) improved at national and regional level	Marine engineering technologies (<i>i.e.</i> fuel efficiency, and greenhouse gas reduction and safety of fishing operation at sea) improved at national and regional level	
Activity 2.1	<p>Two (2) Regional technical meeting on information gathering of the fuel consumption in fishing operation and/or safety on fishing operation of major fishing operation in Southeast Asia (2020 and 2024)</p> <p>Inception meeting on the Regional Technical Meeting on the fuel consumption and/or safety in fishing operation in Southeast Asia (Year 2020; 20,000 USD)</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> ▪ Traveling cost = US\$ 5,500 ▪ DSA = US\$ 5,000 ▪ Accommodation = US\$ 5,500 ▪ Others = US\$ 4,000 	20,000
Activity 2.4	Information dissemination on techniques to manage the fuel consumption, carbon emission and/or safety on fishing operation	Shared with Activities 2.1
Output 3: Regional and national human resources in fish handling techniques onboard fishing vessels improved	Regional and national human resources in fish handling techniques onboard fishing vessels improved	
Activity 3.1	<p>Regional training of trainers (ToT) on fish handling techniques onboard fishing vessels (Year 2020, 2022, and 2024, annual budget 20,000 USD)</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> ▪ Traveling cost = US\$ 5,500 ▪ DSA = US\$ 5,000 ▪ Accommodation = US\$ 5,500 ▪ Materials = US\$ 3,000 ▪ Others = US\$ 1,000 	20,000
Activity 3.3	Information dissemination on fish handling techniques onboard fishing vessels	Shared with Activities 3.1

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.4												
Output 2:												

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 2.1												
Activity 2.4												
Output 3:												
Activity 3.1												
Activity 3.3												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Activity 1 Regional Technical Meeting to identify and information gathering of environmental impacts fishing gear and practices in Southeast Asia and national activities/legislation to reduce/mitigate impacts of fishing gear and practices to marine ecosystem	
Activity 1.1: Inception meeting on the Regional Technical Meeting to identify and information gathering of environmental impacts fishing gear and practices in Southeast Asia and national activities/ legislation to reduce/mitigate impact of impacts fishing gear and practices to ecosystem	<ul style="list-style-type: none"> Meeting report to present the Potential fishing gear modification is identified, and trial/ development work plan drawn up for the year 2021-2023, and Selection criteria/ recommendations to improve low negative impact fishing technologies (<i>i.e.</i> fishing gear, fishing accessories, fishing practice) project areas/countries Re-strengthen IFCOME network and list the member of networks
Activity 2 Regional technical meeting on information gathering of the fuel consumption in fishing operation and/or safety on fishing operation of major fishing operation in Southeast Asia	
Activity 2.1: Inception meeting on the Regional Technical Meeting on the fuel consumption and/or safety in fishing operation in Southeast Asia	Meeting report to present the potential marine engineering techniques to improve fuel utilization and safety in fishing operation is identified, and trial/ development work plan drawn up for year 2021-2023 and update the direction of SEAFDEC MCs to improve fuel utilization and safety in fishing operation
Activity 3 Regional/National training of trainers (ToT) on fish handling techniques onboard fishing vessels	
Activity 3.1: Regional training of trainers (ToT) on fish handling techniques onboard fishing vessels	<ul style="list-style-type: none"> Training report on fishing handling techniques onboard fishing vessels and update present technology of SEAFDEC MCs to improve fuel utilization and safety in fishing operation Fifteen fishery engineers of SEAFDEC MCs can organize the training program in their countries

PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

			Project ID: 202002003
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Enhancing Food Safety and Competitiveness of Seafood Products		
Program Strategy No:	III	Total Period:	2020 - 2024
Lead Department:	Marine Fisheries Research Department (MFRD)	Lead Country:	Singapore
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 343,800
Project Partner(s):	ASEAN-SEAFDEC Member Countries	Budget for 2020:	USD 70,000
Lead Technical Officer:	Ong Yihang, Chief / MFRD	Project Participating Country(ies):	All Member Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

The project aims to look at the improvement of food safety and the competitiveness of seafood products in the ASEAN region through conducting training workshops and developing guidelines, with support of regional technical experts. The project will be implemented via two tracks – developing regional guidelines on Good Manufacturing and Handling Practices (GMP & GHP) for sushi and sashimi and introducing High Pressure Processing (HPP) Processing Protocols for seafood. The proposed activities for each track will include:

- Project and Inception Meeting
- Development/Translation of Training Materials
- Training Workshop
- R&D and Pilot Trials
- Preparation of Publication
- End of Project Meeting

The objectives of the project are to strengthen regional capabilities in safe handling of high-risk seafood products, and introduce advanced processing technology such as HPP to enhance the value, safety and quality of seafood products.

2. Background and Justification

Seafood is an important commodity in many ASEAN Member Countries and serves as an important source of foreign exchange and food supply for these countries. There is an increasing demand for seafood as consumers around the world recognize their nutritional value. However, seafood is very perishable and several chemical and biological changes occur immediately after capture and/or harvest. The deterioration process of seafood quality by microbiological metabolism, oxidative reaction and enzymatic activity are irreversible and are accelerated by poor temperature control along the supply chain. Thus, good handling practices and technologies are extremely critical in keeping the seafood products fresh and safe, extend shelf life, and maintain its quality and economic value from catch to consumer.

In today's fast-moving world including the ASEAN region, consumers increasingly demand for quick and easy Ready-to-Cook (RTC) foods, or even ready-to-eat (RTE) meals. Many consumers are drawn to consuming seafood, because of its high nutritional value, along with its versatility in preparation. Quick- and easy-to-prepare RTE seafood dishes include sushi and sashimi, shucked shellfish and ready-to-cook seafood in sauce. However, the minimally processed or raw nature of these foods put them at high microbiological risk. Therefore, it is essential that these foods are prepared under Good Manufacturing and Handling Practices (GMP & GHP) and with reputable technologies that would mitigate the high microbiological risk while retaining the high nutritional content. Under the project, Regional Guidelines on GMP & GHP for sushi and sashimi will be developed and published, and also capabilities in renowned technologies, such as HPP, will be enhanced.

3. Gender Sensitivity of the Project

The project activities proposed are generally gender-neutral in nature; Both male and female can participate in all the proposed activities.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives)	Indicators	Means of Verification
Fresh and safe seafood are consumed by people and high quality and economic value of seafood are maintained in Southeast Asia	<ul style="list-style-type: none"> - Regional Guidelines for GMP & GHP endorsed - Handbook on HPP of fish and fishery products well-disseminated 	<ul style="list-style-type: none"> - High quality and healthy seafood for people - High quality and high-valued fishery productions
OUTCOME	Indicators	Means of Verification
Enhanced safety and competitiveness of seafood products in Southeast Asia	<ul style="list-style-type: none"> - Food safety promoted - Reduction in foodborne illness from seafood consumption - Production of high-value products from the countries in Southeast Asia 	<ul style="list-style-type: none"> - Food safety - High-valued fishery products
OUTPUT 1	Indicators	Means of Verification
Regional standards serves as a guide in the development of national standards for GMP & GHP for sushi and sashimi	<ul style="list-style-type: none"> - Regional Guidelines on GMP & GHP developed and published 	<ul style="list-style-type: none"> - Regional Guidelines for GMP & GHP
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: Project Planning and Inception Meeting to be held in Singapore in 2020	<ul style="list-style-type: none"> - 2-day meeting organized in Singapore for all SEAFDEC Member Countries (MCs) in the 3rd quarter of 2020 - Implementation plan of the project activities discussed - Two participants from each MC invited - National Project Focal Points identified in MCs - back-to-back with Activity 2.1 	<ul style="list-style-type: none"> - Meeting report - Implementation plan of the project activities - Two participants from each MC - National Project Focal Point in each MC
Activity 1.2: Development of Training Material for GMP & GHP for sushi and sashimi	<ul style="list-style-type: none"> - Training materials will be developed for GMP & GHP for sushi and sashimi while taking into account the scope defined at the inception meeting by local Institute of Higher Learning (IHL) 	<ul style="list-style-type: none"> - Training Materials
Activity 1.3: Regional Training Course on GMP & GHP for sushi and sashimi	<ul style="list-style-type: none"> - Regional Training Course conducted in Singapore by local IHL - ½ day site visit to local food processing company to observe GMP/GHP - Two participants from each MC invited (ideally 1 being the National Project Focal Points and 1 from the MC industry who handles sushi and sashimi) - Resource person(s) invited from Japan 	<ul style="list-style-type: none"> - Training Course report - Two participants from each MCs

GOAL (Overall Objectives)	Indicators	Means of Verification
Activity 1.4: GMP & GHP handling pilot trials	<ul style="list-style-type: none"> - One-year trial on implementing GMP & GHP conducted in MCs - Gaps in manufacturing industry in each country identified and reported 	Country report on the trial from each MC
Activity 1.6: Preparation of Regional Guidelines on GMP & GHP	<ul style="list-style-type: none"> - Feedbacks from in-country consultations collected and reviewed - Draft Regional Guidelines prepared 	Draft Regional Guidelines
Activity 1.7: End of Project Meeting	<ul style="list-style-type: none"> - 2-day meeting organized in Singapore - Two participants from each MC invited - Regional Guidelines finalized with all MCs' consensus - Final draft document of Regional Guidelines will be shared with all MCs for their official endorsement 	<ul style="list-style-type: none"> - Meeting report - Two participants from each MC - Regional Guidelines on GMP & GHP
OUTPUT 2	Indicators	Means of Verification
Handbook on HPP serves as methods to process fish and fishery products through HPP	Handbook on HPP of fish and fishery products developed and published	Handbook on HPP of fish and fishery products
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 2.1: Project Inception Meeting to be held in Singapore in 2020	<ul style="list-style-type: none"> - Two-day meeting organized in Singapore for all MCs in the 2nd quarter of 2020 - Two participants from each MC invited - Project scope and range of seafood products for HPP discussed. - National Project Focal Points identified in MCs - back-to-back activity with 1.1 	<ul style="list-style-type: none"> - Meeting report - Finalised project scope and range of seafood products for HPP - Two participants from each MC - National Project Focal Point in each MC
Activity 2.2: R&D and product development in collaboration with local institutes and industry co-operants/partners	R&D and product development undertaken in collaboration with local institutes and industry cooperants/partners	R&D and product development in trial
Activity 2.3: Development of Training Material for HPP of fish and fishery products	- Training materials will be developed for HPP of fish and fishery products while taking into account the scope defined at the inception meeting by local Institute of Higher Learning (IHL)	- Training Materials
Activity 2.4: Preparation of Handbook on HPP of fish and fishery products	Handbook on HPP of fish and fishery products to be drafted	Draft handbook on HPP of fish and fishery products
Activity 2.5: Regional Training Course on HPP technology	<ul style="list-style-type: none"> - Regional Training Course on HPP technology organized in Singapore - Two participants from each MC invited - Handbook on HPP of fish and fishery products to be finalised with consensus from the participants 	<ul style="list-style-type: none"> - Training Course Report - Two participants from each MC - Finalised Handbook on HPP of fish and fishery products

GOAL (Overall Objectives)	Indicators	Means of Verification
Activity 2.6: Translation of Handbook on HPP of fish and fishery products to other languages	Handbook on HPP of fish and fishery products translated to other languages and published	Handbook on HPP of fish and fishery products in different languages
Activity 2.7: End of Project Meeting and Visit to an overseas commercial High Pressure Processing Plant for Seafood	- One-day meeting - One-day site visit to an overseas commercial High Pressure Processing Plant for Seafood - Two participants from each MC invited	- Meeting and site visit report - Two participants from each MC

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1:																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Activity 1.4																				
Activity 1.5																				
Activity 1.6																				
Activity 1.7																				
Output 2:																				
Activity 2.1																				
Activity 2.2																				
Activity 2.3																				
Activity 2.4																				
Activity 2.5																				
Activity 2.6																				
Activity 2.7																				

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)
Output 1	Activity 1.1	35,000				
	Activity 1.2		10,000			
	Activity 1.3		45,000			
	Activity 1.4			15,000	15,000	
	Activity 1.5				35,000	
	Activity 1.6					2,500
	Activity 1.7					32,500
Output 2	Activity 2.1	35,000				
	Activity 2.2		15,000			
	Activity 2.3			10,000		
	Activity 2.4			10,000		

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year5 (2024)
	Activity 2.5			35,000		
	Activity 2.6				10,000	
	Activity 2.7					45,000
	Sub-Total	70,000	70,000	70,000	70,000	60,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 is available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

A two-day Project Inception and Planning Meeting will be conducted for each of the two tracks to discuss and plan for all project activities. Project Inception and Planning Meeting for both projects will be conducted in back-to-back manner to maximise the use of the experts' time in Singapore.

Track I: Regional standards serve as a guide in the development of national standards for GMP & GHP for sushi and sashimi. The meeting will provide an opportunity for a better overview and understanding of the current trends in raw seafood consumption, and handling practice of such seafood in each country, and briefly assess the requirements/deliverables for each project activity. The meeting will also identify a National Project Focal Point in each country and the commercial co-operant, if any, for the project.

Track II: Handbook on HPP serves as methods to process fish and fishery products through HPP. The meeting will provide an opportunity to understand the current trends in processed seafood products in each country, and determine the range of seafood products that will meet the needs of the Member Countries. The meeting will also identify a National Project Focal Point in each country and the commercial co-operant, if any, for the project.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome	Enhanced safety and competitiveness of seafood products in Southeast Asia	
Output 1:	Regional standards serve as a guide in the development of national standards for GMP & GHP for sushi and sashimi	35,000
Activity 1.1	<p>A two-day Project Inception and Planning Meeting will be held in Singapore in the 3rd quarter of 2020 to discuss and plan for all project activities. Two participants from each Member Country will be invited to attend the meeting. The delegation should consist of one member from the government agency concerned and another from the private sector. The meeting will provide an opportunity for a better overview and understanding of the current trends in raw seafood consumption, and handling practice of such seafood in each country, and briefly assess the requirements/deliverables for each project activity. The meeting will also identify a National Project Focal Point in each country and the commercial co-operant, if any, for the project.</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Traveling Cost</i> = 18,000 USD • <i>Daily subsistence Allowance</i> = 1,800 USD • <i>Accommodation</i> = 9,000 USD • <i>Meeting package</i> = 5,000 USD • <i>Other</i> = 1,200 USD <p><i>Remarks: RTC will be organized in Singapore (2 days)</i></p>	

Proposed Activities	Descriptions	Proposed Budget
Output 2:	Handbook on HPP serves as methods to process fish and fishery products through HPP	35,000
Activity 2.1	<p>The Planning and Inception Meeting will be held in the 2nd quarter of 2020. Two participants from each Member Country will be invited to attend the meeting. The meeting will discuss and plan all the project activities, identify the HPP fish and fishery products of interest to each Member Country, and identify National Project Focal Points.</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Traveling Cost</i> = 18,000 USD • <i>Daily subsistence Allowance</i> = 1,800 USD • <i>Accommodation</i> = 9,000 USD • <i>Meeting package</i> = 5,000 USD • <i>Other</i> = 1,200 USD <p><i>Remarks: RTC will be organized in Singapore (2 days)</i></p>	

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Output 2:												
Activity 2.1												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Activity 1 Development of regional standards and guidelines on safe handling of raw seafood products	
Activity 1.1 Project Planning and Inception Meeting	<ul style="list-style-type: none"> • Completed meeting report • Finalized implementation plan of the project activities • Two participants from each MC • Nominated a National Project Focal Point in each MC
Activity 2 Building capabilities in HPP for seafood to enhance competitiveness	
Activity 2.1 Project Planning and Inception Meeting	<ul style="list-style-type: none"> • Completed Meeting report • Finalized project scope and range of seafood products for HPP • Two participants from each MC • Nominated a National Project Focal Point in each MC

PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

			Project ID: 202006008
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Assistance for Capacity Development in the Region to Address International Fisheries-related Issues		
Program Strategy No:	V	Total Period:	2020 - 2024
Lead Department:	Secretariat (SEC)	Lead Country:	To be identified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 444,500
Project Partner(s):	None	Budget for 2020:	USD 86,000
Lead Technical Officer:	Suwanee Sayan, Senior Program Officer / SEC	Project Participating Country(ies):	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

Regarding regional approaches in addressing the major gaps in the international fisheries-related issues tend to impede the sustainable development of fisheries and aquaculture in the Southeast Asian region. The project aims to provide a platform where discussions among the ASEAN Member States (AMSs) can be made, including regional approaches that could be raised to the international fisheries forum (*e.g.* FAO, meetings of RFMOs, CITES, WTO, etc.). A number of key recommendations by regional and international experts at the meetings to be organized by the project could be used as a basis for regional actions by SEAFDEC and national actions by AMSs. Major outputs of such regional meetings organized by the project over the years include: regional common/coordinated positions and recommendations for national and regional action plans to safeguard the interest in the region and also supports to AMSs on awareness raising for international fisheries-related issues. As a result, inputs from SEAFDEC and AMSs at global level, such as the FAO Committee on Fisheries (COFI), the Endangered Species of Wild Fauna and Flora (CITES), can be made.

2. Background and Justification

Over the years, SEAFDEC has monitored the potential international issues on fish and fish products in Southeast Asia and provided a platform for AMSs through the organization of Expert Meetings and Regional Technical Consultations where the discussions concluded with key recommendations on the trade-related and environment-related issues on international concerns. For example, the proposed listing of commercially-exploited Aquatic Species (CEAS) into the CITES Appendices is one of the crucial issues that could impact not only on the management of fisheries but also on the economies of the countries in the region. Such impacts are anticipated not only as a result of new regulations in trade of the species being listed into the CITES Appendices, but also in the trade of look-alike species, as well as trade in parts or processed forms of the species. The listing of species into the CITES Appendices could therefore result in the termination of data collections on the production of these species, leading to the unavailability of data and information on the status of the species after being listed. Furthermore, the difficulties could also be encountered in proposing to delist or down-list the species once these are listed in the CITES Appendices. At the 32nd Meeting of the SEAFDEC Program Committee in 2000, SEAFDEC was asked to carefully give consideration on the proposed listing of CEAS into the Appendices of the CITES. In response, SEAFDEC has initiated the implementation of the program “Assistance of Capacity Building in the Region to Address International Fish-Trade Related Issues” under the ASEAN-SEAFDEC Strategic Partnership mechanism.

Since then, SEAFDEC has conducted a series of regional fora to facilitate discussions and development of common/coordinated positions among AMSs in the region on the proposals to list certain aquatic species into the CITES Appendices. SEAFDEC has also been undertaking technical activities on the conservation and management as well as on the sustainable utilization of various aquatic species that could be proposed for listing in the Appendices, *e.g.* sharks and rays, seahorses, sea cucumbers, sea turtles and catadromous eels.

These activities aim to come up with data and information on the status and trends of the production and utilization of these species, as well as the existing conservation and management measures undertaken by the countries in the region. The information compiled would serve as basis for discussions on the proposed listing of the species into the CITES Appendices. Furthermore, with a funding support from the CITES-EU, SEAFDEC has been undertaking since 2016 the project that would support the improvement of data collections specifically for recording of sharks and rays at species level, and also the capacity building in the development of Non-Detriment Findings (NDFs) for the conduct of scientific reviews that would justify as to whether the trade endangers the species or not.

SEAFDEC also provides a platform for AMSs to discuss on harmonized approaches toward the issue on fisheries subsidies. For example, the Regional Technical Consultation (RTC) on International Fisheries-related Issues on 20-22 June 2018 in Bangkok, Thailand, included discussions on fisheries subsidies. During the 2018 RTC, it was agreed that the scope of fisheries subsidies should focus on the types of fishing gear and not by species, and that fisheries subsidies should not be considered as standalone issue, as it has a close linkage with other initiatives, *e.g.* sustainability of the fish stocks. In order that the discussions would also address the issues that concern the region, it was agreed that AMSs should consider the possibility of sending a country delegate that comprises especially their national fisheries officers to attend in different clusters of fishery subsidies negotiations. Meanwhile, SEAFDEC should also facilitate the identification of a focal point of each AMS as well as the development of the ASEAN common position on fishery subsidies for adoption by the ASEAN Minister on Agriculture and Forestry (AMAF) to be reflected at the WTO fora upon consideration by the SEAFDEC Council.

In addition, SEAFDEC has been working on the promotion of sustainable fisheries development in the Southeast Asian region since its establishment in 1967. The SEAFDEC program frameworks to support AMSs has been significantly changed in 1998 when SEAFDEC adopted the Resolution on SEAFDEC Strategic Plans at the 30th Meeting of the SEAFDEC Council and more clear after the new millennium in 2001 when ASEAN-SEAFDEC adopted the “Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region” as well as the new decade Resolution and Plan of Action on Sustainable Fisheries for Food Security toward 2020 in 2011 as policy guidelines for SEAFDEC and its Member Countries. To support the implementation of the Resolution and Plan of Action, taking into account environmental changes and many policy emerging issues pressing at global and regional levels including the problems of IUU fishing, SEAFDEC therefore proposes its continuing efforts to further strengthen the SEAFDEC network among AMSs in order to move forward on the sustainable utilization of fisheries resources in the region. In conjunction to this, the cooperation within the region and among AMSs needs to be further enhanced and included in the project framework under the new JTF 6-II in order to share and exchange information and to work together to meet the final goal of the ASEAN SEAFDEC Resolutions and Plan of Action that has been committed by all AMSs.

3. Gender Sensitivity of the Project

No gender sensitive issue in this project because this project welcomed all genders to participate *e.g.* RFPN member.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives)	Indicators	Means of Verification
Sustainable utilization and sound management of fisheries resources through appropriate regional approaches in international fish trade	Regional cooperation in international fish trade Responsible fisheries practice is maintained	- Improved international fish trade - Effective and efficient fisheries management
OUTCOME 1	Indicators	Means of Verification
Actions of AMSs at the international fora reflecting a more understanding with supportive data/information	All AMSs can update and share their status on the international fish trade-related issues	Improved information on and improved capacities of AMSs in international fish trade-related issues

OUTPUT 1	Indicators	Means of Verification
The status of international fish trade-related issues updated and informed AMSs	Detailed information on international fish trade-related issues	Updates of international fish trade-related issues
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: Participation in the relevant regional/international forum on international fish trade, e.g. FAO COFI, CITES, etc.	Participation of one SEAFDEC staff in FAO COFI, CITES, etc.	<ul style="list-style-type: none"> - Meeting report - Back-to-Office report - Newsletter - Appropriate budget allocated for meetings participations
Activity 1.2: The status of international fish trade-related issues reviewed	At less once a year to review/updated status of the international fish trade-related issues	Updates of international fish trade-related information and issues
OUTPUT 2	Indicators	Means of Verification
Cooperation among AMSs aiming to safeguard fisheries and aquaculture of the Southeast Asian region through the development the common/ coordinated positions on the international fish trade-related issue and acknowledge the impact from the international fish trade-related issues	Strengthened cooperation in the region Common/ coordinated positions on the international fish trade-related issue developed	Common/ coordinated positions on the international fish trade-related issue
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 2.1: A platform for Regional Technical Consultation (RTC) (or Senior Official Meeting if required) provided to discuss the international fish trade-related issues which may impact to the development of fisheries and aquaculture in the Southeast Asian region	<ul style="list-style-type: none"> - RTC organized in 2020 - Expected number (50 persons) of participants 	<ul style="list-style-type: none"> - Consultation report - Number (50 persons) of participants - Appropriate budget allocated for meeting participations
Activity 2.2: RTC organized to discuss and develop a common/coordinated position and policy recommendations for AMSs	<ul style="list-style-type: none"> - RTC organized in 2021 - Expected number (50 persons) of participants 	<ul style="list-style-type: none"> - Number (50 persons) of participants - Report of the RTC - The Country's Position on the proposed CEAS by COP as well as the country's views on each proposal to be addressed at the Council Meeting for consideration and adoption - ASEAN-SEAFDEC Common Positions on Inclusion of the Commercially - exploited Aquatic Species (CEAS) to the CITES Appendix

OUTPUT 3	Indicators	Means of Verification
Communications and cooperation with AMSs through the Regional Fisheries Policy Network (RFPN) strengthened	<ul style="list-style-type: none"> - Better communications and improved cooperation between SEAFDEC and AMSs - Effective RFPN roles 	<ul style="list-style-type: none"> - Appropriate communications - Efficient actions by RFPN members
ACTIVITY 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 3.1: Capacities of RFPN enhanced through the participation in SEAFDEC meetings/ workshops	Participation of RFPN members in SEAFDEC meetings/workshops	Meeting report Back-to-Office report Newsletter Appropriate budget allocated for meetings / workshops participations
Activity 3.2: SEAFDEC Fisheries Country Profiles updated under the assignments of RFPN	SEAFDEC Fisheries Country Profiles updated	Updated SEAFDEC Fisheries Country Profiles in the SEAFDEC website
Activities 3.3: Communications with AMSs improved through the support / advice of RFPN members	Information obtained, planned work initiated and actions taken timely	Planned work completed based on appropriate information obtained from AMSs
OUTPUT 4	Indicators	Means of Verification
Information on international fisheries-related issues disseminated in the Southeast Asian region	Updated information on international fisheries-related issues disseminated	Number of publications and dissemination
ACTIVITY 4	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 4.1: Preparation, production and dissemination of the publications on international fisheries-related issues or the results of the project	Publications produced and disseminated	Publications on international fisheries-related issues

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1:																				
Activity 1.1																				
Activity 1.2																				
Output 2:																				
Activity 2.1																				
Activity 2.2																				
Output3:																				
Activity 3.1																				
Activity 3.2																				

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Activity 3.3																				
Output4:																				
Activity 4.1																				

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)
Output 1	Activity 1.1	7,500	3,000	10,000	3,000	7,000
	Activity 1.2	1,000	1,000	1,000	1,000	1,000
Output 2	Activity 2.1	26,000	25,000	25,000	25,000	25,000
	Activity 2.2	-	-	25,000	-	-
Output 3	Activity 3.1	50,000	50,000	50,000	50,000	50,000
	Activity 3.2	500	500	500	500	500
	Activity 3.3	-	-	-	-	-
Output 4	Activity 4.1	1,000	1,000	1,500	1,000	1,000
Sub-Total		86,000	80,500	113,000	80,500	84,500

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 are available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, SEAFDEC will continue to support SEAFDEC staff to participate in the relevant regional/international fora e.g. FAO COFI, CITES, etc. and update the status of the international fish trade-related issues thought providing a platform for Regional Technical Consultation (RTC) for AMSs to discuss the international fish trade-related issues which may impact to the development of fisheries and aquaculture in the Southeast Asian region. The meeting results and/or Meeting Report will be produced and disseminated at the end of the year. In addition, SEAFDEC continues to support and strengthen the cooperation with AMSs through four members of the Regional Fisheries Policy Networks (RFPNs) such as their participation in SEAFDEC meetings/workshops, updates of Country Profiles and assistance in smooth and effective communications with AMSs under the assignments of RFPN.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome 1:	Actions of AMSs at the international fora reflecting a more understanding with supportive data/information	
Output 1:	Review/updated status of the international fish trade-related issues	
Activity 1.1	<p>Participation in the relevant regional/international forum on international fish trade, e.g. FAO COFI, CITES, etc.</p> <p><i>SEAFDEC will participate in the international/regional fora to be updated on the on the international fish trade-related issues e.g. AEG-CI TES, FAO Panel, etc.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Traveling Cost</i> = 3,500 USD • <i>Daily subsistence Allowance</i> = 1,750 USD • <i>Accommodation</i> = 2,250 USD 	7,500

Proposed Activities	Descriptions	Proposed Budget
Activity 1.2	<p>The status of international fish trade-related issues reviewed</p> <p><i>SEAFDEC will update information and current situation on the issues from the international events will be shared to all AMSs for their consideration and information.</i></p>	-
Outcome 2:	<p>Cooperation among AMSs, ASEAN and SEAFDEC Member Countries aiming to safeguard fisheries and aquaculture of SEA region through the development the common/ coordinated positions on the international fish trade-related issue and acknowledge the impact from the international fish trade-related issues</p>	
Output 2:	<p>The Country's Position on the proposed CEAS by COP as well as the country's views on each proposal to be addressed at the Council Meeting for consideration and adoption.</p> <p>ASEAN-SEAFDEC Common/Coordinated Position and regional fishery policy recommendations.</p>	
Activity 2.1	<p>Provide platform for Regional Technical Consultation (RTC) or even Senior Official Meeting (if required) in order to discuss and consider the international fish trade related issues in which may impacts to the development of fisheries and aquaculture in the Southeast Asian Region</p> <p><i>SEAFDEC will be organized the Regional Technical Consultation with the participation from AMSs to seek views and update the status on the international fish trade related issues in their country in which may impacts to the development of fisheries and aquaculture in the Southeast Asian Region. The outputs from the RTC are the regional interest to be address at the International fora</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Traveling Cost</i> = 13,000 USD • <i>Daily subsistence Allowance</i> = 3,300 USD • <i>Accommodation</i> = 5,200 USD • <i>Meeting package</i> = 3,500 USD • <i>Other</i> = 1,000 USD <p><i>Remarks: RTC will be organized in Thailand (2 days)</i></p>	26,000
Outcome 3:	<p>Enhanced regional coordination and collaboration among SEAFDEC Member Countries through</p>	
Output 3:	<p>Strengthened cooperation with ASEAN Member Countries through RFPN</p>	
Activity 3.1	<p>Support RFPNs and enhanced RFPNs capacity through participations of ASEAN-SEAFDEC Meetings</p> <p><i>RFPN members are fishery officers from ASEAN Member States who are invited and stationed at SEAFDEC Secretariat, and to be involved in activities of SEAFDEC especially in terms of coordination with their respective countries. SEAFDEC also supports the expenditures of RFPN members' stationing at SEAFDEC Secretariat as well as business trip to attend related meetings in the region aiming at enhancing capacity of the RFPN Members.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Traveling Cost (450 USD x 4 prs)</i> = 1,800 USD • <i>Honorarium (750 USD x 12 month x 4 Prs)</i> = 36,000 USD • <i>Accommodation (225 USD x 12 month x4 Prs)</i> = 10,800 USD • <i>Other expenses (Health insurance, airport taxes, visa, etc.)</i> = 1,400 USD 	50,000

Proposed Activities	Descriptions	Proposed Budget
Activity 3.2	SEAFDEC Fisheries Country Profiles updated under the assignments of RFPN <i>RFPN members will be assigned to updated country profile on the topic related to the international fish trade-related issues.</i>	-
Activity 3.3	Communications with AMSs improved through the support / advice of RFPN members <i>RFPN members will be assisted and supported SEAFDEC to communication with AMSs to take actions in a timely and smoothly.</i>	-
Outcome 4:	Information/Results and report of the meeting on the international fish trade-related issues were distribute to all participants and who interested	
Output 4:	Publication of the results of the project	
Activity 4.1	Produce and disseminate the publications related to international fisheries related issues or the results of the project <i>Meeting Report will be produced and disseminated.</i> <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Printing meeting results and/or Meeting Report = 1,000 USD</i> 	1,000

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.2												
Output 2:												
Activity 2.1												
Output 3:												
Activity 3.1												
Activity 3.2												
Activity 3.3												
Output 4:												
Activity 4.1												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Activity 1 Actions of AMSs at the international fora reflecting a more understanding with supportive data/information	
Activity 1.1. Participation in the relevant regional/international forum on international fish trade, e.g. FAO COFI, CITES, etc.	<ul style="list-style-type: none"> • Strengthened coordination between SEAFDEC and Member Countries and organizations on statistics-related matters.
Activity 1.2. Review the status of international fish trade-related issues	<ul style="list-style-type: none"> • Updated information and current situation on the issues from the international events will be shared to all AMSs for their consideration and information.
Activity 2 Provide platform to develop the regional recommendations, Common/Coordinated Positions and regional fishery policy recommendations	
Activity 2.1. Provide platform for Regional Technical Consultation (RTC) or even Senior Official Meeting (if required) in order to discuss and consider the international	<ul style="list-style-type: none"> • The regional interest to be address at the International fora such as the draft of Regional Policy Recommendation.

Planned activity	Expected Activity Results
fish trade related issues in which may impacts to the development of fisheries and aquaculture in the Southeast Asian Region.	<ul style="list-style-type: none"> • This draft would be further submission to the SEAFDEC Council Director for endorsement and also high level respectively.
Activity 3 Strengthened cooperation with ASEAN Member Countries through RFPN	
Activity 3.1 Support RFPNs and enhanced RFPNs capacity through participations of ASEAN-SEAFDEC Meetings.	<ul style="list-style-type: none"> • Enhanced knowledge and understanding of the 4-RFPN members on SEAFDEC policy, project implementations and activities. • Gained experiences in writing the report of the meeting and improved their working performance. • Able to expose themselves to work under multi-national environment. • Create network among the Members, facilitating closer cooperation among the Member Countries in the future.
Activity 3.2 SEAFDEC Fisheries Country Profiles updated under the assignments of RFPN.	<ul style="list-style-type: none"> • Country Profile on Fisheries were compiled and presented by those RFPN members through an assignment given to them.
Activity 3.3 Communications with AMSs improved through the support/advice of RFPN members.	<ul style="list-style-type: none"> • RFPN members assisted and supported SEAFDEC to communication with AMSs to actions taken timely and work smoothly.
Activity 4 Publication of the results of the project	
Activity 4.1 Produce and disseminate the publications related to international fisheries related issues or the results of the project.	<ul style="list-style-type: none"> • Published and disseminated Meeting Report or the results of the project.

PROJECT DOCUMENT**PROPOSED ACTIVITIES FOR THE YEAR 2020**

			Project ID: 202004005
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region		
Program Strategy No:	I	Total Period:	2020 - 2024
Lead Department:	Marine Fishery Resources Development and Management Department (MFRDMD)	Lead Country:	To be identified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 225,000
Project Partner(s):	TD, SECTETARIAT	Budget for 2020:	USD 40,000
Lead Technical Officer:	Wahidah Mohd Arshaad, Senior Research Officer / MFRDMD	Project Participating Country(ies):	Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Viet Nam

PART I: PROJECT DESCRIPTION**1. Executive Summary**

In the last few decades, the increase in landing to meet the demand for fins and other downstream products of sharks and rays have caused a decrease in several shark and ray resources worldwide. In order to ensure the survival and sustainable utilization of these resources, many governments in the Southeast Asian region have taken several important steps to mitigate the decrease of the resources. SEAFDEC has undertaken the important step of formulating the Regional Plan of Action (RPOA-Sharks) for the conservation and management of sharks and rays in the region. RPOA-Sharks emphasize the needs to manage and exploit the shark resources at sustainable level and at the same time safeguarding the livelihood of the fishers in the region. Although sharks and rays are not the targeted fishes for the most fisheries in the region, any decision made on the regulating the international trade by listing several common species in Appendix II CITES will affect the livelihood of traditional fishers and traders in the region. Therefore, the governments need to collect landing and biological data on these species and to prepare management plans when needed. Identification of elasmobranchs (sharks & rays) species is fundamental of data collection and law enforcement related to CITES. Expertise on identification and biological data collection on sharks and rays in the region needs to be strengthened. In addition, information on the utilization of by-catch sharks and rays will be collected and compiled in order to enhance understandings on the importance of sharks and rays in the Southeast Asian region and necessity of fisheries management measures.

2. Background and Justification

Information on biodiversity of sharks and rays varies across the Southeast Asian region. Indonesia recorded the highest diversity with 114 species from seven orders and 27 families followed by the Philippines with 96 species (nine orders and 27 families), Thailand 76 species (8 orders and 21 families), Viet Nam 70 species (7 orders and 23 families), Malaysia 68 species (7 orders, 19 families), Myanmar 64 species (8 orders and 19 families), Brunei Darussalam 45 species (6 orders and 15 families), and Cambodia with 26 species from 5 orders and 10 families. Many species still need to be confirmed and most probably misidentified. In general, data collections and shark and ray studies are limited in many countries in the region such as Brunei Darussalam, Myanmar, Cambodia and Viet Nam. Only a few countries such as Indonesia, Malaysia and Thailand have the historical data and more comprehensive studies on this group of fishes. Most countries in this region are still recording landing of sharks and rays by group (sharks and rays) not up to species level. Some countries still did not include sharks and rays landing in their national statistics. Other information such as biological data, stock structure, spatial and temporal distribution of sharks and rays are still lacking in some countries.

Since the landing of sharks and rays recorded commonly less than 2% of the total marine landing (except for Indonesia normally more than 5% relative to bony fishes), most countries did not allocate specific funding or budgets to conduct data collection up to species level, special training on taxonomy or specific research on shark and ray resources. Landing sites are also scattered, and there are too many private landing sites in some countries. Most countries are also facing lack of expertise and competent officers in elasmobranch taxonomy as well as references in their national languages.

However, the pressure on international trade of sharks and rays is growing. Until 2017, 11 species of sharks and 18 species of rays were listed under CITES. They are basking shark (*Cetorhinus maximus*), whale shark (*Rhincodon typus*), oceanic whitetip shark (*Carcharhinus longimanus*), porbeagle shark (*Lamna nasus*), scalloped hammerhead shark (*Sphyrna lewini*), smooth hammerhead shark (*Sphyrna zygaena*), great hammerhead shark (*Sphyrna mokarran*), great white shark (*Carcharodon carcharias*), silky shark (*Carcharhinus falciformis*), pelagic thresher (*Alopias pelagicus*), bigeye thresher (*A. superciliosus*) and thresher shark (*A. vulpinus*). All those shark species were listed in Appendix II. For rays, all six species of sawfishes (family Pristidae) were listed in Appendix I, all nine species of mobula rays and all three species of manta rays in Appendix II. However, some species such as scalloped hammerhead shark (*Sphyrna lewini*), mobula rays and thresher sharks are considered as common species in some countries in the region such as Indonesia. In the CoP-18 CITES to be held at Geneva in 2019, two species of sharks, all species of guitarfishes and all species of wedgefishes are proposed to be included in CITES Appendix II. Based on the adoption of all proposals to include species of sharks and rays during the CITES CoP-17 in 2016, more species were expected to be listed during the CoP-18. In this regard, the countries needed to conduct a Non-Detrimental Findings (NDFs) study by species if the products of those species are for export purposes. To fulfill NDFs requirements and other management purposes, the countries need to collect landings, biological, socio-economy and trade data on these CITES listed species and to prepare management plans when needed. Expertise on identification, landings and biological data needs to be strengthened. In addition, information on utilization of sharks and rays are very useful in order to enhance understandings on the socio-economy importance of sharks and rays in the Southeast Asian region.

These activities correspond to the 2011 Resolution (No. 10: Strengthen knowledge/science-based development and management of fisheries through enhancing the national capacity in the collection and sharing of fisheries data and information) and Plan of Action (No. 4: Enhance regional fishery information systems and mechanisms to facilitate sharing, exchange and compilation of statistics and information) that are required at sub-regional and regional level and apply, where appropriate, regionally standardized definitions and classifications for statistical data to facilitate regional compilation, analysis and data exchange; No. 76: Increase participation and involvement of Member Countries in international fora and technical committees such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); Codex Alimentarius Commission; Food and Agriculture Organization of the United Nations (FAO); Office International des Epizooties (OIE); Regional Fisheries Bodies (RFBs); and World Trade Organization (WTO); and promote ASEAN interest, recognizing that fisheries policies of relevance to the ASEAN region are increasingly discussed and agreed upon at the global level) at the ASEAN-SEAFDEC Conference.

3. Gender Sensitivity of the Project

This is a gender-sensitive project where women and men are given equal opportunity to involved. Gender-sensitive indicators will be analyzed from socio-economic survey data and capacity development program will be conducted. The development of socio-economic survey questionnaire will include gender-sensitive questions. The sex disaggregated data will also be collected for all activities implemented.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives)	Indicators	Means of Verification
Sustainable Utilization of Sharks and Rays in the Southeast Asian region.	- Incomes of workers (e.g. fishers, traders, processors, etc.) related in the fishery industry will not decrease through sustainable fishery production	- Historical bycatch data on sharks and rays provided by enumerators

	- Number of AMSs incorporating the management advice on resource utilization in their national policies	- Data from socio-economic surveys of workers (<i>e.g.</i> fishers, traders, processors, etc.) related in the fishery industry in the Southeast Asia - NPOA and NDF
OUTCOME	Indicators	Means of Verification
Stock assessments and management advice for Sharks and Rays in the Southeast Asia region	- Number of stock assessments and number of publications for shark and ray management - ASEAN Member States (AMSs) implement the strategic program for improving landing data, biological information, marketing and trade channels as well as fishers' livelihood - Well arrangement of fisheries statistics for important species through correct identification by enumerators and easily accessed electronic materials - Establishment of National/state repositories	- Conference presentations, publications, technical reports and scientific papers - Government made policies or regulations on the conservation and management based on the latest available information
OUTPUT 1	Indicators	Means of Verification
Capacity development in taxonomy, new species/record identifications and management of major shark species	- About 40 experts well trained during 4 on-site trainings (10 persons/training: north-Viet Nam, Philippines, Yangon and Kalimantan) and one workshop (for 16 persons/workshop) conducted - Improved fisheries, customs and enforcement officers knowledge in identification of CITES listed species during inspection at sea and ports. - Effective fishery management of important species through clarification of their genetic structures. - Clarification of genetic structure for major shark species in the Southeast Asian region	- Conference presentations - SOP (Standard Operating Procedure), - Technical reports and scientific papers
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: One training course and workshop on chondrichthyans taxonomy and biology	A five-day Regional training will be conducted at MFRDMD in 2022	- Training report - At least 2 participants of participating Member Countries and TD
Activity 1.2: On-site training on taxonomy and biology at selected landing sites	Four-day trainings will be conducted in 5 countries (<i>i.e.</i> Cambodia, Indonesia, Philippines Myanmar, and Viet Nam), and shared, exchanged and improved the data and information collections in 2021, 2022 and 2023	- Training reports - At least 10 local officers at each training

GOAL (Overall Objectives)	Indicators	Means of Verification
Activity 1.3: Meetings on chondrichthyans research and Access and Benefit Sharing in the region	Regional meetings will be organized by MFRDMD to compile and sharing information in 2020 and 2024	- Meeting reports - At least 2 participants of participating Member Countries, TD and Secretariat
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.4: Publication of up-dated guidebook on identification of chondrichthyans in the region	New guidebook will be published to update latest information including new species and new records in the region in 2024	Guidebook in the last year of the project (2024)
Activity 1.5: Supporting data collection at least one site in Indonesia, Malaysia, Myanmar, Philippines, Viet Nam and Thailand (Proposed by TD and MFRDMD)	Targeting at least one site/year from 2020, 2021,2022, 2023 and 2024	Long-term landing data very useful for estimating stock and biomass using models like Bayesian Surplus Production model and Bayesian State Space Surplus Production Model
Activity 1.6: Training workshops on sharks for stock assessment models (Proposed by TD)	Four-day training workshops in 2021 and 2023.	- Workshop reports - Participants of participating Member Countries, TD and Secretariat
OUTPUT 2	Indicators	Means of Verification
Confirmation of stock structures for at least two common species of sharks/rays and one CITES listed species in participating countries (shared-stock or separate stocks)	Biomass at least two common species estimated from 2022	Information on biomass of six common species in participating countries
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 2.1: Study of stock structures of selected species of sharks and rays by genetic markers	12 populations for mtDNA studies in 3 species (<i>Chiloscyllium hasseltii</i> , <i>Carcharhinus sorrah</i> and <i>Sphyrna lewini</i>) in the 4 regions (WCPM, ECPM, Kota Kinabalu and Tawau)	- Study report - Report presented at international fora and published
OUTPUT 3	Indicators	Means of Verification
Development of socio-economic studies in the northern part of Viet Nam, Western part of Myanmar and Celebes Island or Kalimantan Indonesia using methods such as Multifactor Partitioning Analysis	Enhancement of legal exports on products of sharks and rays in the SAE region through development of NDF documents.	Government transparencies in marketing and trade control of CITES listed species and endangered species

ACTIVITY 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 3.1: Survey on fishers' dependencies, marketing and trade of sharks and rays in the region/country visited	5 regions covered: mid-Viet Nam, north-Viet Nam, Irrawaddy, Mindanao (Sulu and Sulawesi Seas) and Bali in years 2021, 2022 and 2023	- Survey report - Information on marketing trade and channels of sharks and rays in participating countries - Development of NDF documents for selected CITES listed species especially considered as common in this region such as <i>Sphyrna lewini</i> , <i>Alopias pelagicus</i> , <i>Alopias superciliosus</i> , <i>Carcharhinus falciformes</i> , <i>Mobula japanica</i> and <i>M. thurstoni</i> ² . Development of NDF documents for selected CITES listed species especially considered as common in this region such as <i>Sphyrna lewini</i> , <i>Alopias pelagicus</i> , <i>Alopias superciliosus</i> , <i>Carcharhinus falciformes</i> , <i>Mobula japanica</i> and <i>M. thurstoni</i>

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1:																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Activity 1.4																				
Activity 1.5																				
Activity 1.6																				
Output 2:																				
Activity 2.1																				
Output 3:																				
Activity 3.1																				

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)
Output 1	Activity 1.1			25,000		
	Activity 1.2		5,000	5,500	8,000	
	Activity 1.3	25,000				26,000
	Activity 1.4					2,000
	Activity 1.5	5,000	5,000	5,000	5,000	6,000
	Activity 1.6		21,500		22,000	
Output 2	Activity 2.1	10,000	10,000	10,000	10,000	10,000
Output 3	Activity 3.1		3,000	3,000	3,000	
Sub-Total		40,000	44,500	48,500	48,000	44,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 is available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

Although sharks and rays are not the targeted fishes for the most fisheries in the region, any decision made on the regulating the international trade by listing several common species in the CITES Appendix II will affect the livelihood of traditional fishers and traders. Therefore, governments need to collect landing and biological data on these species and to prepare management plans when needed. SEAFDEC continues to support the Member Countries for the sustainable utilization of shark and ray resources. MFRDMD will organize a meeting to introduce the new project in 2020. The meeting aims to introduce the JTF 6-II project on sharks and rays from 2020 to 2024 and to share information regarding the previous JTF project and Access and Benefit Sharing (Convention of Biological Diversity) in the region. TD and MFRDMD will support landing data collection in participating countries. For confirming stock structures of 3 shark species (*Chiloscyllium hasseltii*, *Carcharhinus sorrah* and *Sphyrna lewini*), samples will be collected in the region.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome	Stock assessments and management advice for Sharks and Rays in the Southeast Asia region	
Output 1	Capacity development in taxonomy, new species/record identifications and management of major shark species	
Activity 1.3	<p>MFRDMD will organize a meeting to introduce the project in 2020. Two participants from each country will be invited. The Core Expert Meeting (CEM) in 2020 aims to obtain information on the current landing data collection and trade of sharks and rays in SEAFDEC Member Countries; to update current national initiatives related to management of sharks and rays; to present the results of the JTF 6 project conducted from 2015-2019; to explain the JTF 6-II project on sharks and rays from 2020 to 2024; and to develop appropriate on-site trainings proposal to improve national information collection on sharks and rays in participating countries. The meeting will be conducted in Malaysia.</p> <p><Estimates> Travel Costs (MCs+TD): Air fare: 370 x 2prs x 8 (7 countries + TD); (Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, Viet Nam and TD): \$ 5,920 DSA: \$70 x 16prs x 3 days = \$ 3,360 Terminal allowances: \$40 x 16 prs = \$ 640 Accommodations: \$70 x 16 prs x 4 nights = \$ 4,480</p>	25,000

Proposed Activities	Descriptions	Proposed Budget
	<p>Travel Costs (MFRDMD): <i>Airfare: \$130 X 7 prs</i> = \$ 910 <i>DSA (officers): \$35 x 7prs x 4 days</i> = \$ 980 <i>DSA (Secretariat of meeting) = \$30 x 2 prs x 5 day</i> = \$ 300 <i>DSA (Drivers) = \$25 x 2 prs x 5 day</i> = \$ 250 <i>Terminal allowances: \$80 X 7 prs</i> = \$ 560 <i>Accommodations (officers): \$70 x 7 prs x 4 nights</i> = \$ 1,960 <i>Accommodations for secretariat & drivers of the meeting \$70 X 2 room (2prs) x 5 nights</i> = \$ 700 Meeting Arrangements <i>Meeting package: \$70 x 25 prs</i> = \$ 1,750 <i>Welcome dinner: \$20 x 30 prs</i> = \$ 600 Meeting Costs <i>Stationery:</i> = \$190 <i>Souvenir (t-shirt): \$10x 40 prs</i> = \$ 400 <i>Printing of proceeding (ebook):</i> = \$ 900 <i>Communications and internet fees:</i> = \$ 1,100 <i>Total:</i> = \$ 25,000</p>	
Activity 1.5	<p>During the JTF 6, TD has supported data collection in Indonesia, Malaysia, Myanmar, Viet Nam and Thailand. Data should be collected continuously for at least five years for CPUE and stock assessments. In this regard during the JTF 6-II project, at least one site from each participating country will be sponsored for landing data collection until 2024.</p> <p><Estimates> <i>Enumerators: \$1,000 x 5 countries</i> = \$ 5,000</p>	5,000
Output 2	Confirmation of stock structures for at least two common species of sharks/rays and one CITES listed species in participating countries (shared-stock or separate stocks)	
Activity 2.1	<p>Study of stock structures of two common species of sharks and one CITES listed species in participating countries by genetic markers. At least 30 specimens per species of <i>Chiloscyllium hasseltii</i>, <i>Carcharhinus sorrah</i> and <i>Sphyrna lewini</i> from West Coast of Peninsular Malaysia, East Coast of Peninsular Malaysia, Kota Kinabalu and Tawau will be collected. Study will be conducted from 2020-2024.</p> <p><Estimates> Sampling (Kuantan) <i>Transport: \$ 300</i> <i>DSA: \$35 x 4prs x 5days</i> = \$ 700 <i>Accommodation: \$70 x 4 prs x 4 nights</i> = \$ 1,120 <i>Specimens: 90 pcs x \$5</i> = \$ 450 <i>Total</i> = \$ 2,570 Sampling (Kota Kinabalu) <i>Air fare: \$350 x 2pr</i> = \$ 700 <i>DSA: \$35 x 3prs x 5days</i> = \$ 525 <i>Terminal Allowance: \$80 x 2prs</i> = \$ 160 <i>Accommodation: \$70 x 3 prs x 4 nights</i> = \$ 1,120 <i>Specimens: 90 pcs x \$5</i> = \$ 450 <i>Transport:</i> = \$ 200 <i>Total</i> = \$ 3,155</p>	10,000

Proposed Activities	Descriptions	Proposed Budget
	<i>Research Expenses</i> <i>Consumable equipment supplies:</i> = \$600 <i>Chemicals and reagents:</i> = \$ 500 <i>DNA PCR kit:</i> = \$ 1,000 <i>Marker and primer:</i> = \$ 175 <i>DNA sequencing: \$25 x 80 samples</i> = \$ 2,000 <i>Total</i> = \$ 4,275	

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.2												
Activity 1.3												
Activity 1.4												
Activity 1.5												
Activity 1.6												
Output 2:												
Activity 2.1												
Output 3:												
Activity 3.1												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Output 1 Capacity development in taxonomy, new species/record identifications and management of major shark species	
Activity 1.3: Meetings on chondrichthyans research and Access and Benefit Sharing in the region	Understanding of the Phase II JTFVI project on sharks and rays from 2020 to 2024 <ul style="list-style-type: none"> Sharing information regarding the previous JTF project and Access and Benefit Sharing (Convention of Biological Diversity) in the region
Activity 1.5: Supporting data collection at least one site in Indonesia, Malaysia, Myanmar, Philippines, Viet Nam and Thailand (proposed by TD and MFRDMD)	<ul style="list-style-type: none"> Starting data collection in participating Member Countries
Output 2 Confirmation of stock structures for at least two common species of sharks/rays and one CITES listed species in participating countries (shared-stock or separate stocks).	
Activity 2.1: Study of stock structures of selected species of sharks and rays by genetic markers	<ul style="list-style-type: none"> Collection of samples (<i>Chiloscyllium hasseltii</i>, <i>Carcharhinus sorrah</i> and <i>Sphyrna lewini</i>)

PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

			Project ID: 202005003
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Sustainable Utilization of Anguillid Eel in the Southeast Asia Region		
Program Strategy No:	I	Total Period:	2020 - 2024
Lead Department:	Inland Fishery Resources Development and Management Department (IFRDMD)	Lead Country:	To be identified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 225,000
Project Partner(s):	None	Budget for 2020:	USD 45,000
Lead Technical Officer:	Takuro Shibuno, Deputy Chief / IFRDMD	Project Participating Countries:	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

This project is aimed at keeping the sustainable management and utilization of anguillid eel fisheries resources in the Southeast Asian region through the strategic program of sustainable eel resources management. There are two main activities under the project. The first one is for sustainable eel fisheries resources and to standardize the data collection system in Southeast Asia. The second is mapping the genetic population structure of tropical eels in Southeast Asia based on mtDNA approach.

2. Background and Justification

With the rapid decline of temperate eels, the market value of tropical eels rises in recent years. Glass eel (juvenile of eel) capture fisheries in tropical zone increase dramatically. In order to avoid the over exploitation on glass eel, the Indonesian government issued the regulation to prohibit export of eel seeds less than 150 g from Indonesia's territory. The similar policies to prohibit export of eel seeds are enforced in some other countries. Conservation and management policy issues on tropical eel resources for their sustainability become more important not only in Indonesia but also in the region. Therefore, the region needs a policy to balance between utilization and sustainability of tropical eel resources. At the same time, we should consider that we just have quite limited knowledge on tropical eel species in this region.

In the five-year program (2015-2019), IFRDMD conducted its activities to establish and strengthen a regional network for improving the management and conservation of anguillid eel fisheries resources and environment in the region. IFRDMD also focused on the capacity development in the Member Countries for improving the management of anguillid eel fisheries.

In the fisheries management, the information on genetic population structure or stocks are very important because it can identify the source and sink populations and the potential for the replenishment of depleted stocks. Further, molecular genetic techniques have become more widespread in oceanic systems and in the fisheries management due to the ability to identify distinct stocks, genetic health and connectivity between stocks. Genetic study with an objective to identify genetic population structure of the tropical eels (*Anguilla* spp. except *Anguilla bicolor*) in Southeast Asia will be conducted for five years (2020-2024). The marker (mtDNA) will be used in this study.

IFRDMD will be further engaged in promoting the sustainable management and utilization of anguillid eel resources in the Southeast Asian region. The activities will be conducted for improving the sustainable eel fisheries and standardizing the data collection system, and clarifying the eel genetic population structure in Southeast Asia.

3. Gender Sensitivity of the Project

This project is sensitive with the gender issue. The market chain on anguillid eel resources closely related to the woman activity for supporting their livelihood. Mostly the consolidator and collector of anguillid eel in certain countries are female. They also support for the data collection as enumerator. Therefore, in the 2020-2024 study, it needs to strengthen their empowerment through this project.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives, Impact)	Indicators	Means of Verification
Sustainable fisheries resources to support the food security and livelihood	The livelihood of fishers is secure and stable, fishery diversity is maintained	Historical catch data on anguillid eel provided by enumerators
OUTCOME	Indicators	Means of Verification
Strategic program of Sustainable Eel resources management in Southeast Asia	AMS implement the Strategic program of Sustainable Eel resources management in Southeast Asia	Government adopts the document and makes a policy/regulation
OUTPUT 1	Indicators	Means of Verification
Sustainable eel fisheries and standardize data collection system in Southeast Asia	Developing sustainable and standardize data collection system	Government adopts the system
ACTIVITY 1	Indicators: key Inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: Conducting a survey to collect the data of catch and CPUE of Anguillid eel fisheries	A survey conducted	Survey reports
Activity 1.2 Conducting a survey to collect the biological data of Anguillid eel fisheries	A survey conducted	Survey reports
Activity 1.3: Conducting a regional workshop organized at IFRDMD for making the Field guide to identify the Anguillid eel	Regional workshop is organized at IFRDMD for making the Field guide to identify the Anguillid eel	Field guide to identify the Anguillid eel
OUTPUT 2	Indicators	Means of Verification
Genetic population structure of tropical eels in Southeast Asia	Genetic data of tropical eels in Southeast Asia	Genetic study report
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 2.1: Conducting a survey to collect tissue sample of tropical eels in Southeast Asia	A survey conducted	Survey reports
Activity 2.2: Conducting genetic analyses in laboratory	A laboratory analysis conducted	Survey reports

OUTPUT 3	Indicators	Means of Verification
Successful project management through regular monitoring and evaluation	Project achievement.	Report of results and evaluation
ACTIVITY 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 3.1 Project monitoring and evaluation lead by Project Leader undertaken	<ul style="list-style-type: none"> - Progress meetings twice a year to confirm the improving of each activity. - The evaluation at the end of year by experts. - Hiring one assistant to carry out the project effectively. 	Semi-annual and annual progress report, and their evaluation results

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1:																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Output 2:																				
Activity 2.1																				
Activity 2.2																				
Output 3:																				
Activity 3.1																				

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year5 (2024)
Output 1	Activity 1.1	16,000	16,000	16,000	16,000	8,000
	Activity 1.2	10,000	10,000	10,000	10,000	4,000
	Activity 1.3					14,000
	Activity 1.4					
Output 2	Activity 2.1	11,000	9,000	9,000	9,000	9,000
	Activity 2.2	3,500	5,500	5,500	5,500	5,500
Output 3	Activity 3.1	4,500	4,500	4,500	4,500	4,500
Sub-Total		45,000	45,000	45,000	45,000	45,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 is available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, the project on the sustainable utilization of anguillid eel in the Southeast Asia region will commence with conducting a survey for collecting the catch and biological data (Activity 1.1 and Activity 1.2). The survey will contribute to the sustainable eel fisheries and standardize the data collection system in the Member Countries. Further in the Activities 2.1 and 2.2, a genetic survey will be conducted to identify the genetic population structure of tropical anguillid eels in Southeast Asia by using a mtDNA marker. The sample and/or tissue of *Anguilla marmorata* will be collected and analyzed in the selected Member Countries (*i.e.* Indonesia, Philippines, Viet Nam, and Myanmar) in 2020. Under the Activity 3, a meeting will be conducted twice a year to confirm the progress and improvement of each activity. The achievement of the study will be evaluated by experts at the end of 2020. One Project Assistant will be hired to carry out the project operations and administration effectively.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome	Strategic program of Sustainable Eel resources management in Southeast Asia	
Output 1	Sustainable eel fisheries and standardize data collection system in Southeast Asia	26,000
Activity 1.1	<p>Conducting a survey to collect the data of catch and cpue of Anguillid eel fisheries.</p> <p><i>The Surveys will conduct in Indonesia and Philippines for updating status and collect the data of catch and effort of Anguillid eel fisheries</i></p> <p><i>Estimated expenditures:</i> <i>Enumerator fee (4 countries) : \$ 16,000</i></p>	16,000
Activity 1.2	<p>Conducting a survey to collect the biological data of Anguillid eel fisheries.</p> <p><i>The survey to collect the biological data of Anguillid eel will conduct in Indonesia and Philippines. Kind of biological data are such as length-weight, reproduction biology, otolith.</i></p> <p><i>Estimated expenditures:</i> <i>Transportation to AMSs : \$ 4,000</i> <i>Accommodation fees : \$ 3,000</i> <i>Local transport : \$ 400</i> <i>DSA : \$ 2,300</i> <i>Office expenditures and contingency: \$300</i></p>	10,000
Output 2	Genetic population structure of tropical eel in Southeast Asia	14,500
Activity 2.1	<p>Conducting a survey to collect tissue samples of tropical eel.</p> <p><i>In this part, the activities is collection eel tissue samples. Eel tissue samples will be collected by collaboration. Some of area by national project and some of area by JTF project.</i> <i>In 2020, JTF budget will be used for the collection eel tissue sample in three area Indonesia (Bali, Kalimantan, and Maluku). Samples from regional countries (Philippines, Viet Nam, and Myanmar) will be conducted when activities survey to collect the biological data of Anguillid eel fisheries happen.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • DSA Researcher = \$ 630 • DSA Enumerator/DOF = \$ 315 	11,000

Proposed Activities	Descriptions	Proposed Budget
	<ul style="list-style-type: none"> • Accommodation/Hotel = \$ 1,680 • Local transport = \$ 900 • Airfare = \$ 2,400 • Sample fees = \$ 3,000 • Sample fees to AMS (Viet Nam and Philippines) = \$ 2,000 	
Activity 2.2	<p>Conducting laboratory work to analyze genetic population structure of tropical eel.</p> <p><i>In this part, there are two activities. The first is laboratory work for the extraction, PCR, electrophoresis, and sequencing. The second is analysis data.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • Ethanol absolute = \$ 213 • Kit for extraction = \$ 605 • Kit for PCR = \$ 150 • Sequencing cost = \$ 2,420 <p><i>Tissue, Glove, Mask, delivery service of sample to Genetic science = \$ 112</i></p>	3,500
Output 3	Project management to lead to success	4,500
Activity 3.1	<p>Progress meetings twice a year to confirm the improving of each activity. The evaluation at the end of year by experts. Hiring one assistant to carry out the project effectively.</p> <p><i>Progress meetings will be conducted to confirm the improving of each activity. The achievement of this study will be evaluated at the end of year by experts. One Assistant will be hired to carry out the project operations and administration effectively.</i></p> <p><i>Estimated expenditures:</i></p> <p><i>Travel cost of 2 evaluators (share) = \$ 2,200</i></p> <p><i>Meeting costs (share) = \$ 300</i></p> <p><i>Salary of Assistant (share) = \$ 2,000</i></p>	

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.2												
Activity 1.3												
Output 2:												
Activity 2.1												
Activity 2.2												
Output 3:												
Activity 3.1												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Output 1 Sustainable eel fisheries and standardize data collection system in Southeast Asia	
Activity 1.1 Conducting a survey to collect the data of catch and CPUE of Anguillid eel fisheries	<ul style="list-style-type: none"> • Database of catch and CPUE of Anguillid eel fisheries • Survey report
Activity 1.2 Conducting a survey to collect the biological data of Anguillid eel fisheries	<ul style="list-style-type: none"> • Survey report
Output 2 Genetic population structure of tropical eels in Southeast Asia	
Activity 2.1 Conducting a survey to collect tissue samples of tropical eels in Southeast Asia	<ul style="list-style-type: none"> • Report of collection eel tissue sample from the field
Activity 2.2 Conducting genetic analyses in the laboratory	<ul style="list-style-type: none"> • Report of laboratory work. • Submit to Journal
Output 3 Successful project management through regular monitoring and evaluation	
Activity 3.1 Project monitoring and evaluation lead by Project Leader undertaken	<ul style="list-style-type: none"> • Progress meetings conducted twice a year to confirm the improving of each activity • The evaluation at the end of year by experts • One Assistant hired to carry out the project operations and administration effectively

PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

			Project ID: 202001014
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Sustainable Utilization of Fisheries Resources and Resources Enhancement in Southeast Asia		
Program Strategy No:	I	Total Period:	2020 - 2024
Lead Department:	Training Department (TD)	Lead Country:	To be identified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 400,000
Project Partner(s):	None	Budget for 2020:	USD 80,000
Lead Technical Officer:	Sukchai Arnupapboon, Head, Fishing Ground and Oceanography Section / TD	Project Participating Country:	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

The fisheries play significant roles to social and economic of the world. Marine productions provide a primary source of protein to people and also contribute the livelihood to many sectors, *i.e.* fisher, trader etc. Many Southeast Asia countries are among the highest producers of fishery products in the world. However, during the past several decades, the growing international, regional and national demands for marine products have led to the continued development and modernization of fishing technology. Unfortunately, this increased demands and the corresponding technology response have resulted in the over- exploitation of many fishery resources in the world.

To avoid the ASEAN fisheries catch becoming its downward trend same as globally. To promote sustainable fisheries, over the past decade SEAFDEC has provided technical support to explore the under-utilized offshore fisheries resources and enhance fisheries resources through various programs, *e.g.* technical meetings, workshops, training courses and research studies on fisheries resource exploration, fisheries abundance, stock assessment as well as artificial habitat installation .

To enhance the sustainable utilization of fisheries resources in the region, SEAFDEC will implement the project entitled “Sustainable Utilization of Marine Fisheries Resources and Resource Enhancement in Southeast Asia” from 2020 to 2024. The key activities for this project include organizing the regional consultation meetings and capacity development training courses, conducting research surveys, developing the application of Fisheries Geographic Information System (FGIS) and Remote Sensing (RS) as well as enhancing fisheries resources and its habitat. It is expected that the livelihood for marine fishers are secured and stable through the sustainable utilization of marine fisheries resources and resource enhancement in the Southeast Asia region.

2. Background and Justification

Over a half of the world’s people obtains a significant source of protein from seafood. In Southeast Asia, this proportion is significantly higher. The Southeast Asian region is blessed with the high productivity of fisheries resources because of the rich ecosystems such as dense mangrove forests and seagrass beds sustained by the rich effluence of nutrients from land. However, over several decades, fisheries in Southeast Asia have exceeded its point of sustainability. Many of the commercially important fishery resources in the region have declined due to many factors *e.g.* overfishing, illegal fishing, use of destructive fishing practices and environmental degradation.

As reflecting to the decline of fisheries resources in Southeast Asia, SEAFDEC has conducted a series of activities to promote sustainable fisheries for fishers and fishing communities in the region. For example, SEAFDEC under the JTF6 conducted two (2) activities, such as the “*Off-shore Fisheries Resource Exploration in Southeast Asia*” and the “*Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia*” over the last 7 years. This is in line with the United Nations’

Sustainable Development Goals 14 (Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable development). Based on the lesson learnt regarding promoting sustainable fisheries, it has revealed that effective strategies and management as well as science-based knowledge on marine resources are a prerequisite for the sustainable utilization and enhancement of fisheries resources. In this connection, to further support and encourage the SEAFDEC Member Countries are ongoing challenges in the sustainable utilization of fisheries resources through the project entitled “Sustainable Utilization of Marine Fisheries Resources and Resource Enhancement in Southeast Asia” under the JTF 6-II is ongoing challenge.

3. Gender Sensitivity of the Project

The project is not gender-sensitive but neutral and equalized.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives)	Indicators	Means of Verification
Sustainable utilization of marine fisheries resources in Southeast Asia	<ul style="list-style-type: none"> - The livelihood for marine fishers is secure and stable - Responsible fisheries practice is maintained 	Catch and socio-economic data on marine fisheries in Southeast Asia
OUTCOME	Indicators	Means of Verification
Strengthened management of marine fisheries resources in Southeast Asia through improved technical capacities	Management of marine fisheries resources improved Scientific research reports	Comments and recommendations from the Member Countries at SEAFDEC Program Committee Meeting (PCM)
OUTPUT 1	Indicators	Means of Verification
Technical capacities of human resources (<i>i.e.</i> junior fisheries officers and researchers) to conduct marine fisheries resources and oceanographic research/survey improved in Southeast Asia	Number of competent researchers and effective marine fisheries resources and oceanographic research/survey	<ul style="list-style-type: none"> - Good data collections and analysis - Appropriate survey plan - Appropriate sampling gear and oceanographic equipment
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: Regional training on design of sampling gear for fisheries resources research survey (Year 2020)	<ul style="list-style-type: none"> - One regional training on design of sampling gear for fisheries resources research survey conducted - Expected number (11) of persons trained 	<ul style="list-style-type: none"> - Training report that present number (11) of participants - Country reports
Activity 1.2: Regional training on fisheries oceanographic (Year 2021)	<ul style="list-style-type: none"> - One regional training on oceanographic equipment for fisheries resources survey conducted - Expected number (11) of persons trained 	<ul style="list-style-type: none"> - Training report that present number (11) of participants - Country reports

ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.3: Regional training on research cruise planning for marine fisheries resources and oceanographic survey (Year 2022)	<ul style="list-style-type: none"> - One regional training on research cruise planning for marine fisheries resources and oceanographic survey conducted - Expected number (11) of persons trained 	<ul style="list-style-type: none"> - Training report that present number (11) of participants - Country reports
Activity 1.4: Regional training on data collection and fisheries resources stock assessment (Year 2023)	<ul style="list-style-type: none"> - One regional training on data collection and fisheries resources stock assessment conducted - Expected number (11) of persons trained 	<ul style="list-style-type: none"> - Training report that present number (11) of participants - Country reports
Activity 1.5: Research and human resources development on microplastic and marine debris in SEA (Year 2024)	<ul style="list-style-type: none"> - One regional training on marine debris and microplastic conducted - Expected number (10) of persons trained - Two marine debris and microplastic survey conducted in ASEAN water 	<ul style="list-style-type: none"> - Training report that present number (10) of participants - Country reports
Activity 1.6: IEC materials for regional trainings	<ul style="list-style-type: none"> - IEC materials for regional trainings developed and utilized in the above-mentioned trainings 	<ul style="list-style-type: none"> - IEC materials (<i>i.e.</i> handbooks, textbooks, SOPs, references, etc.)
OUTPUT 2	Indicators	Means of Verification
Technical knowledge, technical skills and field experience of SEAFDEC staff and Member Countries' researchers improved	<ul style="list-style-type: none"> - Participation in research/survey cruises and a regional/international - Meeting 	<ul style="list-style-type: none"> - Successful research cruises - Active participation in research/survey and meeting - Good data collections and analysis
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 2.1: Participation of SEAFDEC staff or/and Member Countries' researchers in a research/ survey cruise	<ul style="list-style-type: none"> - SEAFDEC staff and Member Countries researchers 15 persons participated in 5 research/survey cruises in 5 years (3 persons/year) 	<ul style="list-style-type: none"> - Cruise reports - Scientific/research papers and articles
Activity 2.2: Participation of SEAFDEC staff or/and Member Countries' researchers in a regional / international meeting on fisheries resources and stock assessment	<ul style="list-style-type: none"> - SEAFDEC staff and Member Countries researchers 5 persons participated in regional / international meetings 5 meeting in 5 years (1 person/year) 	<ul style="list-style-type: none"> - Report on meeting participation - Meeting report
OUTPUT 3	Indicators	Means of Verification
Research cruise plan for research/training vessels of SEAFDEC and Member Countries developed	<ul style="list-style-type: none"> Research cruise plan developed 	<ul style="list-style-type: none"> - Research cruise plan - Comments and recommendations from a research vessel Captain and Chief Researcher

ACTIVITY 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 3.1 Technical consultation meeting to develop a research cruise plan for research/ training vessels of SEAFDEC and Member Countries	<ul style="list-style-type: none"> - Five technical consultation meetings to develop a research cruise plan for research / training vessels of SEAFDEC and Member Countries organized (one meeting in every year) - Expected total number (20) of participants. (each year 4 persons) 	<ul style="list-style-type: none"> - Meeting reports - Research cruise plan - Number (20) of participants
OUTPUT 4	Indicators	Means of Verification
Scientific knowledge to support fisheries management on transboundary fisheries resources in Sub-region	Sub-region has update the status of transboundary fisheries resources in Southeast Asia	Report of the status of transboundary fisheries resources in Southeast Asia
ACTIVITY 4	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 4.1: Technical consultation meetings on identification of transboundary fisheries resources and geographical area	<ul style="list-style-type: none"> - Update on the transboundary fisheries resources status in the geographical area organized - Expected number (15) of participants 	<ul style="list-style-type: none"> - Meeting reports - Technical reports - Number (15) of participants
Activity 4.2: Technical consultation/ Workshop/training on monitoring the status of transboundary fisheries resources in Sub-region	<ul style="list-style-type: none"> - Three (3) workshops/trainings on monitoring status of transboundary fisheries resources in Andaman Sea GOT and SSS conducted - Expected number (15) of participants 	<ul style="list-style-type: none"> - Workshop/training reports - Number (15) of participants
Activity 4.3: Participation in a national / regional / international meeting to disseminate the survey results and management on the transboundary fisheries resources	<ul style="list-style-type: none"> - Summarizing the survey results and management on the transboundary fisheries resources disseminated (One meeting/year) - Budget is allocated with for Activities 4.1 and 4.2 	<ul style="list-style-type: none"> - Report on meeting participation - Meeting report
OUTPUT 5	Indicators	Means of Verification
Application of Fisheries Geographic Information System (FGIS) and Remote Sensing (RS) for monitoring marine fisheries resources and environment in Southeast Asia	Application of Fisheries Geographic Information System (FGIS) and Remote Sensing (RS) for monitoring marine fisheries resources and environment developed	Application of Fisheries Geographic Information System (FGIS) and Remote Sensing (RS) for monitoring marine fisheries resources and environment
ACTIVITY 5	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 5.1: Regional technical meeting or workshop or training on utilization of FGIS and RS to improve fisheries management (Year 2020-2024)	<ul style="list-style-type: none"> - Five regional technical meeting or workshop or training on utilization of FGIS and RS organized - Expected number (15) of participants 	<ul style="list-style-type: none"> - Meeting reports - Training report - Technical reports - Number 15 participants

ACTIVITY 5	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 5.2: Participation in a national / regional / international meeting to disseminate the FGIS and RS to improve fisheries management in SEA	SEAFDEC participated in the 5 meetings and the survey results and management on the transboundary fisheries resources disseminated (One meeting/year)	- Report on meeting participation - Meeting report - Budget is allocated with for Activities 5.1
OUTPUT 6	Indicators	Means of Verification
Resource enhancement through the installation of artificial habitat	Resource enhancement is assessed	Impact assessment on fisheries resources and marine environment
ACTIVITY 6	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 6.1: Technical consultation meeting on the impacts for fisheries resources and marine environment by the installation of artificial habitat (Year 2020 and 2024)	- Two technical consultation meetings on the impacts for fisheries resources and marine environment by the installation of artificial habitat organized - Expected number 40 participants	- Meeting reports - Technical reports - Workplan on the investigation for the impacts for fisheries resources and marine environment by the installation of artificial habitat - Number 40 participants
Activity 6.2: Survey on the impacts for fisheries resources and marine environment by the installation of artificial habitat (Year 2021-2022)	- Three surveys on the impacts for fisheries resources and marine environment by the installation of artificial habitat conducted in the 2 nd and 3 rd year (during the post northeast monsoon, post southwest monsoon and southwest monsoon) - Expected series of publication on the impacts for fisheries resources and marine environment by the installation of artificial habitat 3 publication	- Survey reports - Progress reports and Standard operational procedure to investigate impact of fisheries resources and marine environment by the installation of artificial habitat
Activity 6.3: Training workshop on the survey results of the impacts for fisheries resources and marine environment by the installation of artificial habitat (Year 2023)	- One training workshop on the survey results of the impacts for fisheries resources and marine environment by the installation of artificial habitat conducted - Expected number 20 participants	- Workshop report - Number 20 of participants

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1:																				
Activity 1.1		■																		
Activity 1.2						■														
Activity 1.3										■										
Activity 1.4														■						

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Activity 1.5		■				■				■				■				■		
Activity 1.6				■				■				■				■				■
Output 2:																				
Activity 2.1			■				■				■				■				■	
Activity 2.2			■				■				■				■				■	
Output 3:																				
Activity 3.1	■				■				■				■				■			
Output 4:																				
Activity 4.1			■																	
Activity 4.2							■				■				■				■	
Activity 4.3			■				■				■				■				■	
Output 5:																				
Activity 5.1		■					■				■				■				x	■
Activity 5.2			■				■				■				■				■	
Output 6:																				
Activity 6.1			■																■	
Activity 6.2					■	■	■	■	■	■	■	■								
Activity 6.3															■					

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)
Output 1	Activity 1.1	15,000				
	Activity 1.2		15,000			
	Activity 1.3			15,000		
	Activity 1.4				15,000	
	Activity 1.5	5,000	5,000	5,000	5,000	20,000
	Activity 1.6					
Output 2	Activity 2.1	5,000	2,500	2,500	2,500	2,500
	Activity 2.2	2,500	2,500	2,500	2,500	2,500
Output 3	Activity 3.1	5,000	5,000	5,000	5,000	5,000
Output 4	Activity 4.1	15,000				
	Activity 4.2		15,000	15,000	15,000	
	Activity 4.3					15,000
Output 5	Activity 5.1	12,000	12,000	12,000	12,000	12,000
	Activity 5.2	3,000	3,000	3,000	3,000	3,000
Output 6	Activity 6.1	17,500				
	Activity 6.2		20,000	20,000	20,000	
	Activity 6.3					20,000
Sub-Total		80,000	80,000	80,000	80,000	80,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 is available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020**1. Project Summary in 2020**

The project activities in 2020 are focused on the training, research and workshop. These activities aim to improve the national and regional fisheries and environment resources survey activities in the Southeast Asia region by enhancing knowledge, skills and experiences of fisheries officers/researchers through the human resource development programs. It also includes supporting the researchers of SEAFDEC and Member Countries (MCs) to participate in a relevant international/regional/national meeting and attend a fisheries cruise survey in SEAFDEC or MCs' research vessel(s). The project provides the MCs with supporting for planning a research cruise of the research/training vessels of SEAFDEC and MCs.

In order to enhance the sustainable utilization of fisheries resources in the region, the project will support the initiative of sub-regional fisheries resources management by following up the status and trends of transboundary fisheries resources in the Gulf of Thailand sub-region. The technical research and development on regional Fisheries Geographic Information System and Remote Sensing (FGIS and RS) will improve the technical knowledge and information, and support for managing fisheries resources at national and regional level. Under the project, SEAFDEC will conduct a five-year study on the impacts for fisheries resources and marine environment by installing artificial habitats. In 2020, the lesson learnt in the promotion of sustainable fisheries resources by using artificial habitats will be summarized, and pilot sites will be further identified to study on appropriate techniques to evaluate impacts of the installed artificial habitats in the coastal areas of Southeast Asia. Information Education and Communication (IEC) materials on the project activities (*i.e.* handbooks, textbooks, SOPs, references, etc.) will be disseminated through the SEAFDEC website and relevant official events.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome	Strengthened management of marine fisheries resources in Southeast Asia through improved technical capacities	
Output 1	Technical capacities of human resources (<i>i.e.</i> junior fisheries officers and researchers) to conduct marine fisheries resources and oceanographic research/survey improved in Southeast Asia	
Activity 1.1	Regional training on design of sampling gear for fisheries resources research survey <i>Regional training on sampling gear for fisheries research survey is designed for the junior researchers who will work onboard fisheries resource research vessel. The training course focuses on the general fishing gear used for collect/sampling fisheries resources and special equipment to collect biological samples, including their standard operational procedure of them. Eleven (11) trainees from SEAFDEC Member Countries will be invited.</i> <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 8,000 • <i>Daily subsistence allowance</i> = US\$ 2,000 • <i>Accommodation</i> = US\$ 3,000 • <i>Resource Persons</i> = US\$ 500 <i>Others (e.g. stationary, lunch, Coffee break and etc.) = US\$ 1,500</i> 	15,000
Activity 1.5	Research and human resources development on microplastic and marine debris in Southeast Asia. <i>SEAFDEC researcher(s) will participate in the relevant international/regional/national microplastic and marine debris activities.</i> <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 2,000 • <i>Daily subsistence allowance</i> = US\$ 1,500 	5,000

Proposed Activities	Descriptions	Proposed Budget
	<ul style="list-style-type: none"> • Accommodation = US\$ 1,000 Others = US\$ 500 	
Output 2	Technical knowledge, technical skills and field experience of SEAFDEC staff and Member Countries' researchers improved	
Activity 2.1	<p>Participation of SEAFDEC staff or/and Member Countries' researchers in a research/ survey cruise</p> <p><i>This activity will support few researchers of SEAFDEC or Member Countries to participate in the research cruise to improve skill and enhance experience in the fisheries resources exploration.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • Traveling cost = US\$ 1,500 • Daily subsistence allowance = US\$ 2,000 • Accommodation = US\$ 1,000 Others = US\$ 500 	
Activity 2.1	<p>Participation of one (1) SEAFDEC staffs or/and Member Countries in the regional of international meeting on fisheries resources and stock assessment</p> <p><i>This activity will support SEAFDEC/TD technical staff(s) to participate in the international/regional/national meetings/workshop/ symposium to promote result fisheries resources exploration or stock assessment study in Southeast Asia.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • Traveling cost = US\$ 500 • Daily subsistence allowance = US\$ 500 • Accommodation = US\$ 1,000 Others = US\$ 500 	
Output 3	Research cruise plan for research/training vessels of SEAFDEC and Member Countries developed	
Activity 3.1	<p>Technical consultation meeting to develop a research cruise plan for research/ training vessels of SEAFDEC and Member Countries.</p> <p><i>a) This activity will support fisheries officer(s) from SEAFDEC Member Countries to participate in the Technical consultation meeting to develop national research cruise plan for research/ training vessels of SEAFDEC and Member Countries.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • Accommodation = US\$ 1,000 • Local transportation = US\$ 500 • Others (e.g. stationary, lunch, Coffee break and etc.) = US\$ 500 <p><i>b) Two (2) SEAFDEC researchers will technical visit to Member Countries and participate in the Technical consultation meeting to develop a research cruise plan for research/ training vessels of SEAFDEC and Member Countries.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • Traveling cost = US\$ 1,000 • Daily subsistence allowance = US\$ 500 • Accommodation = US\$ 1,000 Others = US\$ 500 	5,000
Output 4	Scientific knowledge to support fisheries management on transboundary fisheries resources in Sub-region	
Activity 4.1	<p>Technical consultation meetings on identification of transboundary fisheries resources.</p> <p><i>SEAFDEC/TD will organize the sub-regional technical consultation meetings on identification of transboundary fisheries resources. The meeting aims to follow up the status and trend of transboundary fisheries resources in Sub-region. Eleven (11) participants from SEAFDEC MCs will participate in meeting.</i></p> <p><i>Estimated expenditures:</i></p>	15,000

Proposed Activities	Descriptions	Proposed Budget
	<i>Traveling cost</i> = US\$ 8,000 <i>Daily subsistence allowance</i> = US\$ 1,700 <i>Accommodation</i> = US\$ 3,000 <i>Resource Persons</i> = US\$ 500 <i>Others (e.g. stationary, lunch, Coffee break and etc)</i> = US\$ 1,800	
Activity 4.3	Participation in a national / regional / international meeting to disseminate the survey results and management on the transboundary fisheries resources (Budget is allocated with for Activities 4.1)	
Output 5	Application of Fisheries Geographic Information System (FGIS) and Remote Sensing (RS) for monitoring marine fisheries resources and environment in Southeast Asia	
Activity 5.1	Regional technical meeting or workshop or training on the utilization techniques of FGIS and RS to improve fishing ground exploration and fisheries management in Southeast Asia. <i>SEAFDEC/TD will organize the Regional technical meeting or workshop or training on the utilization techniques of FGIS and RS to improve fishing ground exploration and fisheries management in Southeast Asia. Ten (10) Participants from SEAFDEC MC will participate in the meeting or workshop or training to improve the knowledge and enhance experience to apply GIS and RS to support fisheries management.</i> <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 6,000 • <i>Daily subsistence allowance</i> = US\$ 1,500 • <i>Accommodation</i> = US\$ 2,000 • <i>Resource Persons</i> = US\$ 1,000 <i>Others (e.g. stationary, lunch, Coffee break and etc)</i> = US\$ 1,500	12,000
Activity 5.2	Participation in a national / regional / international meeting to disseminate project activities and their results. <i>Two (2) researchers of SEAFDEC will participation in the meeting or workshop or training on the utilization techniques of FGIS and RS to improve fishing ground exploration and fisheries management in Southeast Asia.</i> <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 1,500 • <i>Daily subsistence allowance</i> = US\$ 500 • <i>Accommodation</i> = US\$ 500 <i>Others</i> = US\$ 500	3,000
Output 6	Resource enhancement through the installation of artificial habitat	
Activity 6.1	Technical consultation meeting on the impacts for fisheries resources and marine environment by the installation of artificial habitat. <i>SEAFDEC/TD will organize the regional technical consultation meeting on the impacts for fisheries resources and marine environment by the installation of artificial habitat. Eleven (11) participants from SEAFDEC MCs will participate in the meeting to development and improve their knowledge and experience</i> <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 8,000 • <i>Daily subsistence allowance</i> = US\$ 3,000 • <i>Accommodation</i> = US\$ 4,500 • <i>Resource Persons</i> = US\$ 1,000 <i>Others (e.g. stationary, lunch, Coffee break and etc)</i> = US\$ 1,000	17,500

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1.1												
Activity 1.2												
Activity 1.6												
Activity 2.1												
Activity 2.2												
Activity 3.1												
Activity 4.1												
Activity 4.3												
Activity 5.1												
Activity 5.2												
Activity 6.1												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Activity 1	
Activity 1.1: Regional training on design of sampling gear for fisheries resources research survey	<ul style="list-style-type: none"> • Eleven (11) researchers has develop their knowledge to support fisheries research survey • Training curriculum that could be developed as training manual in the future • Training report on the design of sampling gear for fisheries resources research survey
Activity 1.5: Research and human resources development on microplastic and marine debris in Southeast Asia	<ul style="list-style-type: none"> • Two (2) SEAFDEC staffs or/and Member Countries' researchers develop their experience and knowledge in microplastic and marine debris research study in Southeast Asia • Training or observation report on the microplastic and marine debris in Southeast Asia
Activity 2	
Activity 2.1: Participation of SEAFDEC staff or/and Member Countries' researchers in a research/ survey cruise	<ul style="list-style-type: none"> • SEAFDEC staffs or/and Member Countries' researchers develop their experience in a research/ survey cruise • Report on the participation in a research/ survey cruise
Activity 2.2: Participation of SEAFDEC staff or/and Member Countries' researchers in a regional/international meeting on fisheries resources and stock assessment	<ul style="list-style-type: none"> • SEAFDEC staffs or/and Member Countries' researchers develop their experience in fisheries resources and stock assessment in regional or international level • Report on the participation in the regional / international meeting on fisheries resources and stock assessment
Activity 3	
Activity 3.1: Technical consultation meeting to develop a research cruise plan for research/ training vessels of SEAFDEC and Member Countries	<ul style="list-style-type: none"> • One (1) research cruise plan (at least) for research/training vessels of SEAFDEC and Member Countries

Planned activity	Expected Activity Results
Activity 4	
Activity 4.1: Technical consultation meetings on identification of transboundary fisheries resources and geographical area	<ul style="list-style-type: none"> • Report on Technical consultation meetings on identification of transboundary fisheries resources and geographical area to develop the activity framework and general status on transboundary fisheries resources in the geographical areas
Activity 4.3: Participation in a national / regional / international meeting to disseminate the survey results and management on the transboundary fisheries resources	<ul style="list-style-type: none"> • SEAFDEC staff or/and Member Countries' researchers develop their experience in fisheries resources and stock assessment in regional or international level • Report on the participation in the regional / international meeting on fisheries resources and stock assessment
Activity 5	
Activity 5.1: Regional technical meeting or workshop or training on the utilization techniques of FGIS and RS to improve fishing ground exploration and fisheries management in Southeast Asia	<ul style="list-style-type: none"> • Report on technical consultation meeting on the impacts for fisheries resources and marine environment by the installation of artificial habitat • Countries update on the installation of artificial habitat in Southeast Asia
Activity 5.2: Participation in a national / regional / international meeting to disseminate project activities and their results	<ul style="list-style-type: none"> • Two (2) researchers of SEAFDEC participate in the meeting or workshop or training on the utilization techniques of FGIS and RS to improve fishing ground exploration and fisheries management in Southeast Asia. • Report on the participation in the regional / international meeting on in the meeting or workshop or training on the utilization techniques of FGIS and RS to improve fishing ground exploration and fisheries management
Activity 6	
Activity 6.1: Technical consultation meeting on the impacts for fisheries resources and marine environment by the installation of artificial habitat	<ul style="list-style-type: none"> • Report on technical consultation meeting on the impacts for fisheries resources and marine environment by the installation of artificial habitat • Countries update on the installation of artificial habitat in Southeast Asia

PROJECT DOCUMENT
PROPOSED ACTIVITIES FOR THE YEAR 2020

			Project ID: 202004006
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region		
Program Strategy No:	I	Total Period:	2020 - 2024
Lead Department:	Marine Fishery Resources Development and Management Department (MFRDMD)	Lead Country:	To be identified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 275,000
Project Partner(s):	None	Budget for 2020:	USD 60,000
Lead Technical Officer:	Mohammad Faisal bin Md Saleh, Senior Research Officer / MFRDMD	Project Participating Country(ies):	Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam

PART I: PROJECT DESCRIPTION
1. Executive Summary

This project aims to evaluate the pelagic fish resources in the Southeast Asian region in order to establish the sustainable management strategy for the pelagic fisheries. The transboundary fishes like mackerel, tuna and anchovies, which are the major targeted species chosen for this project based on the abundance of those species in the AMSs, require efficient fisheries management strategies of their stocks. This project also involves the genetic component of the targeted one pelagic species in the SEA region and is developing the life-history study of the targeted species through age determination analysis. The information on the life history of major neritic tunas in the region was uninvestigated in most of the AMSs.

MFRDMD is the responsible SEAFDEC Department for this project to manage and coordinate all project activities with the financial support from the Government of Japan (JTF). Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam are involved throughout this project in providing information and samples required. This project entitled “Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region” is being proposed to aim at;

- To evaluate the current status of two small pelagic species through stock assessment and risk assessment studies.
- To evaluate the current status of two neritic tuna species through stock assessment and risk assessment studies.
- To clarify the stock structure for neritic tuna species in the Southeast Asian region.
- To carry out the life-history study for neritic tuna species in the SEA region.

As the keys to the fishery management and policies, stock assessments and risk assessments are considered as important starting points in providing the best scientific information to support the sustainable management of pelagic fishes in the SEA region.

2. Background and Justification

The previous JTF projects namely JTF 2 and JTF 6 undertook a research on major targeted pelagic fishes in the SEA region with the different goals. The JTF 2 project aimed to ascertain the migration route and existence/absence of sub-populations of small pelagic fishes in the ASEAN region. Meanwhile, the JTF 6 project, which aimed to develop the reliable management strategies for purse seine fisheries in the Southeast Asian region, collected the fundamental information on purse seine fisheries (catch and effort data, biological

data of species caught by purse seine gear) associated to the multispecies situation of pelagic fishes in the SEA region. Further study is required to acquire more extensive information and data for the assessment and management of four dominant pelagic species in the SEA region. In line with previous programmes as well as to strengthen the initiatives taken, thus there is a need to carry out the stock assessment (SA) and risk assessment (RA) for the pelagic fishery. This new project targets two neritic tuna species and two small pelagic species dominated the catch in each AMS in the SEA region.

The transboundary fish *i.e.* tunas, anchovies and mackerels are the economically important pelagic species that are high consumptions within the SEA countries, as well as dominated the fishery exports of the SEA countries to other regions of the world. In 2014, the neritic tuna contributed approximately 40% of the region's total marine tuna production, with the value of around USD 1 million (SEASOFIA 2017). Shorthead anchovy (*Encrasicholina heteroloba*) and Indian anchovy (*Stolephorus indicus*) are two dominant anchovies in the Southeast Asian region. Nevertheless, *Encrasicholina punctifer* dominated the landing in the northern part (Kelantan) of the East Coast of Peninsular Malaysia (Mohammad Faisal, 2016). Throughout 2002-2013, the production values (in US Dollars) of anchovies in the South China Sea fluctuated but gradually increased, while in the Andaman Sea, the values appeared to be stable and consistent (SEAFDEC 2002-2013). Mackerels contributed approximately 60% to the total small pelagic species production in 2014. *Rastrelliger* spp. contributed nearly 77% to the region's total mackerel production, with Indonesia as the largest producer (Fishery Statistical Bulletin of Southeast Asian 2014, SEAFDEC 2016a).

This project corresponds to Resolution No. 10 of at the ASEAN-SEAFDEC Conference in 2011; strengthened knowledge/science-based development and management of fisheries through enhancing the national capacity in the collection and sharing of fisheries data and information.

3. Gender Sensitivity of the Project

This is a gender-sensitive project where women and men are given equal opportunity to involved. Gender-sensitive indicators will be analyzed from fisheries data and capacity development program will be conducted. Fisheries data which integrate gender information through quantitative and qualitative aspects will be analyzed. The sex disaggregated data will also be collected for all activities implemented.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives)	Indicators	Means of Verification
Sustainable Utilization of Pelagic Fishes in the Southeast Asian region	Incomes of workers (<i>e.g.</i> fishers, traders, processors, etc.) related in the pelagic fishery industry will increase through sustainable fishery production	Official statistical data on fisheries and data from socio-economic surveys of workers (<i>e.g.</i> fishers, traders, processors, etc.) related in the fishery industry in the Southeast Asia
OUTCOME	Indicators	Means of Verification
Efficient Management Strategies for Small Pelagic Fishes and Neritic Tunas in the Southeast Asia region are adopted by governments and fishers	Number of AMSs incorporating the management advice on resource utilization in their national policies	FMPs (Fishery Management Plans) for pelagic fishes by each AMSs
OUTPUT 1	Indicators	Means of Verification
Stock Assessments and Risk Assessments for small pelagic fishes in the Southeast Asian region	Number of assessments for small pelagic fish in SCS and AS (for targeted species, <i>i.e.</i> anchovies and mackerels/scads)	Conference presentations and technical reports

ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: Stock Assessments and Risk Assessments for small pelagic fishes in the Southeast Asian region	Number of targeted species in the region (anchovies and mackerels/scads)	Practical workshop and country/technical report
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.2: Workshops for small pelagic fishes in the Southeast Asian region	2 workshops (1 internal workshop and 1 regional workshop)	Workshop reports
Activity 1.3: Meetings for small pelagic fishes in the Southeast Asian region	3 Core Expert Meetings	Meeting reports
OUTPUT 2	Indicators	Means of Verification
Stock Assessments and Risk Assessments for major neritic tuna species in the Southeast Asian region	Number of assessments at least 2 major species of neritic tuna in SCS and AS to be carried out	Conference presentations and technical reports
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 2.1: Stock Assessments and Risk Assessments for neritic tunas in the Southeast Asian region	Number of targeted species in the region (at least two)	Practical workshop and country/technical report
Activity 2.2: Clarification of the stock structure for one neritic tuna species in the Southeast Asian region	Number of regions studied for Microsatellite DNA for Kawakawa: Microsatellite DNA conducted in 12 locations in SCS, AS and SSS	Genetic workshop and scientific paper
Activity 2.3: Life-history study for major neritic tuna species in the Southeast Asian region	Number of specimens studied for tuna in ECPM (Tok Bali/Kuantan): 1 stock – in Tok Bali/Kuantan	Practical workshop and technical report
Activity 2.4: Workshops for major neritic tuna species in the Southeast Asian region	4 workshops including stock assessment and genetic (2 internal workshops and 2 regional workshops)	Workshop reports

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1: Stock Assessments and Risk Assessments for small pelagic fishes in the Southeast Asian region																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Output 2: Stock Assessments and Risk Assessments for major neritic tuna species in the Southeast Asian region																				
Activity 2.1																				

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Activity 2.2																				
Activity 2.3																				
Activity 2.4																				

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)
Total: \$275,000

Output	Activities	Year 1	Year 2	Year 3	Year 4	Year 5
		(2020)	(2021)	(2022)	(2023)	(2024)
Output 1:	Activity 1.1					
Stock Assessment and Risk Assessments for small pelagic fishes in the Southeast Asian region	Stock Assessments and Risk Assessments for small pelagic fishes	5,550	5,550	5,550	8,900	5,550
	Activity 1.2		18,000			
	Workshops for small pelagic fishes					
	Activity 1.3					
	Meetings for small pelagic fishes	25,000		25,000		25,000
Output 2:	Activity 2.1					
Stock Assessments and Risk Assessments for major neritic tuna species in the Southeast Asian region	Stock Assessments and Risk Assessments for neritic tunas	3,450	3,450	3,450	6,900	3,450
	Activity 2.2					
	Clarification of the stock structure for one neritic tuna species	9,000	9,000	13,000	10,000	5,000
	Activity 2.3					
	Life-history study for major neritic tuna species	17,000	6,500	4,500	6,200	2,000
	Activity 2.4					
	Workshops for major neritic tuna species		13,000		20,000	15,000
Sub-Total		60,000	55,500	51,500	52,000	56,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 is available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, MFRDMD will continue directing the collaboration from the Member Countries and relevant organizations to conduct regional studies on share stocks entitled “Fisheries Management Strategies for Pelagic Fish Resources in the Southeast Asian Region” under the JTF 6-II. Considering the earlier-related projects under the same funding (JTF), MRFDMD will initiate some activities with aiming to evaluate the pelagic fish resources in the Southeast Asian region in order to establish the sustainable management strategy for the pelagic fisheries. The transboundary fishes like mackerels/scads, neritic tunas and anchovies, which are the major

targeted species chosen for the project based on their abundance in the AMSs, require the efficient fisheries management strategy of their stocks. As a key to the fisheries management and policies, stock assessments and risk assessments are considered as important starting points in providing the best scientific information to support the strategies. This project also inquires the clarification of genetic structure of the targeted one neritic tuna species as well as develops its life-history through age determination analysis (otolith analysis). Yet, information on the life history of major neritic tunas was uninvestigated in most of AMSs. In 2020, the project will focus on collecting and compiling the regional information for stock and risk assessment study, and arranging the Core Expert Meeting to discuss the current status of targeted pelagic species in the South China Sea and Andaman Sea. Necessary equipment and samples for those studies will be purchased. By the end of the year, the meeting report will be produced and disseminated once available.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome	<i>Efficient Management Strategies for Small Pelagic Fish and Neritic Tunas in the Southeast Asia region are adopted by governments and fishers</i>	
Output 1	<i>Stock Assessment and Risk Assessment for small pelagic fish in the Southeast Asian region</i>	
Activity 1.1: Stock Assessment and Risk Assessment for small pelagic fishes in the Southeast Asian region	<p><i>SEAFDEC/MFRDMD will collect and compile regional information of targeted small pelagic species from AMS for stock assessment and risk assessment study.</i></p> <p><Estimate></p> <ul style="list-style-type: none"> ○ Research Expense: <ul style="list-style-type: none"> Hire of supporting staff: \$575 x 1 person x 6 months = \$ 3,450 ○ Communication: = \$ 1,800 ○ Stationery: = \$ 300 	\$5,550
Activity 1.3: Meetings for small pelagic fishes in the Southeast Asian region	<p><i>SEAFDEC/MFRDMD will organize the 1st Core Expert Meeting (CEM) to discuss and update on the current status of targeted pelagic species in the South China Sea and Andaman Sea as well as sharing information and knowledge of genetic study of the targeted neritic tuna species. Representatives from each participating Member Countries will be invited to attend the CEM.</i></p> <p><Estimates></p> <p>Meeting Expenses</p> <p>Travel Costs:</p> <ul style="list-style-type: none"> ○ Member Countries <ul style="list-style-type: none"> Air fare = \$ 3,940 (2 prs. from participating AMS) <ul style="list-style-type: none"> Land transport = \$ 200 Daily Subsistence Allowances (DSA) = \$ 3,360 Accommodation = \$ 4,690 ○ SEC/TD <ul style="list-style-type: none"> Air fare: \$250 x 2prs = \$ 500 DSA = \$420 Accommodation = \$ 536 ○ MFRDMD <ul style="list-style-type: none"> Air fare: \$120 x 8prs = \$ 960 DSA = \$1,670 Accommodation = \$ 2,613 <p>Local transportation = \$ 519</p> <ul style="list-style-type: none"> ○ Resource Persons: <ul style="list-style-type: none"> Air fare = \$ 1,230 DSA = \$ 600 Accommodation = \$402 ○ Terminal Allowance: USD40 x 30prs = \$1,200 	\$25,000

Proposed Activities	Descriptions	Proposed Budget
	Meeting Costs: ○ Stationery: = \$ 280 ○ Contingency: = \$ 380 Publication: ○ Publication of Meeting Report = \$1,500	
Output 2	<i>Stock and Risk Assessment for major neritic tuna species in the Southeast Asian region</i>	
Activity 2.1: Stock Assessment and Risk Assessment for neritic tunas in the Southeast Asian region	<i>SEAFDEC/MFRDMD will collect and compile regional information of targeted species from AMS for stock assessment and risk assessment study.</i> <Estimates> Research Expenses: ○ Hire of supporting staff: \$575 x 1 person x 6 months = \$ 3,450	\$3,450
Activity 2.2: Clarification of stock structure for one neritic tuna species in the Southeast Asian region	<Estimates> Research Expenses: ○ Sampling (additional locations) = \$ 600 ○ Consumable equipment supplies = \$ 400 ○ Extraction kit = \$ 500 Consultant Fees: ○ PCR and Fragment Analysis= \$30 x 250 samples: \$ 7,500	\$9,000
Activity 2.3: Life-history study for major neritic tuna species in the Southeast Asian region	<Estimates> Research Expenses: ○ Equipment: ISOMET 1000 Precision Saw = \$ 13,500 ○ Preparation chemical: EpoKwick FC (resin & hardener) = \$ 1,500 ○ Preparation kit: Cold Mounting Accessories = \$ 500 ○ Samples for trial = \$ 1,500	\$17,000

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.3												
Output 2:												
Activity 2.1												
Activity 2.2												
Activity 2.3												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Output 1 Stock Assessment and Risk Assessment for small pelagic fish in the Southeast Asian region	
Activity 1.1: Stock Assessment and Risk Assessment for small pelagic fishes in the Southeast Asian region	<ul style="list-style-type: none"> Two small pelagic fish will be chosen Compilation of catch data of targeted two small pelagic species from AMSs for stock and risk assessment
Activity 1.2: Meetings for small pelagic fishes in the Southeast Asian region	<ul style="list-style-type: none"> Updated current status of targeted small pelagic fisheries in South China Sea and Andaman Sea 1st CEM will be organized

Planned activity	Expected Activity Results
	<ul style="list-style-type: none"> • Meeting report will be published and disseminated to AMSs
Output 2 Stock and Risk Assessment for major neritic tuna species in the Southeast Asian region	
Activity 2.1: Stock Assessment and Risk Assessment for neritic tunas in the Southeast Asian region	<ul style="list-style-type: none"> • Two neritic tuna species will be chosen • Compilation of landing data of two targeted neritic tuna species from AMSs
Activity 2.2: Clarification of stock structure for one neritic tuna species in the Southeast Asian region	<ul style="list-style-type: none"> • Purchase of the equipment, chemical, disposable laboratory consumables, kit and samples for genetic structure study of one neritic tuna in SEA region • Findings from PCR and Fragment analysis
Activity 2.3: Life-history study for major neritic tuna species in the Southeast Asian region	<ul style="list-style-type: none"> • Purchase of the equipment, chemical, disposable laboratory consumables, kit and samples for otolith analysis of one neritic tuna species • Pilot study (trial) for otolith study of one neritic tuna species

PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

			Project ID: 202003003
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Sustainable Aquaculture through Cost-Effective Culture Systems and Prompt and Effective Aquatic Animal Health Management		
Program Strategy No:	II	Total Period:	2020 - 2024
Lead Department:	Aquaculture Department (AQD)	Lead Country:	To be identified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 650,000
Project Partner(s):	None	Budget for 2020:	USD 130,000
Lead Technical Officer:	Koh-ichiro Mori, Deputy Chief / AQD	Project Participating Country(ies):	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

This Project is being proposed to:

1) Community-Based Hatchery, Nursery, Grow-out of Giant Freshwater Prawn (GFWP) in Laguna Lake and Tributaries

This activity aims to develop a community-based strategy for mass production of high-value indigenous species such as the giant freshwater prawn post-larvae (PL) for grow-out and explore a strategy for managing enhanced inland fisheries.

2) Promoting Alternative Feeds for Sustainable Production of Freshwater Aquaculture Species

This activity aims to further develop alternative feeds using locally readily available feed ingredients for culturing freshwater species in a small-scale in Southeast Asia.

3) Ecosystem Approach to Responsible/Sustainable Shrimp Farming

This activity aims to identify an aquaculture management plan that can improve shrimp production, and include the development of a recirculating system using earthen ponds. Organisms that can be used in the constructed/artificial wetlands will be identified.

4) Development of Aquaculture Techniques on New Aquatic Species for Promotion and Creation of Local Aquaculture Industry

This activity aims to develop techniques for promoting and creating local aquaculture industry, *i.e.* for flathead lobster, breeding, seed production and nursery rearing; for kawakawa and shortfin scad, breeding, seed production and grow-out; for seahorse, technique for distinguishing wild and cultured.

5) Development Diagnosing Procedures Against Emerging Shrimp and Fish Diseases

This activity aims to diagnose unknown mortalities comprehensively, develop diagnosing procedures against emerging shrimp and fish diseases, and develop disinfection procedure for polychaetes.

6) Survey of the Epidemiology, Distribution, Occurrence and Prevalence of EHP

This activity aims to survey for the epidemiological information and elucidate various aspects of *Enterocytozoon hepatopenaei* (EHP) infection.

7) In Vitro and in Hatchery Investigation of Organisms, Chemicals and Methods to Prevent or Mitigate the Effect of Important Shrimp Diseases

This activity aims to investigate other organisms, chemicals and methods against important shrimp pathogens in the hatchery, in order to come up with recommendations and guidelines to protect or mitigate of the diseases.

8) Application of Integrated Approaches in the Management of Viral Infections and Other Emerging Diseases in Brackish Water Ponds

This activity aims to apply integrated approaches combining elements of vaccination, host inhibition of pathogen multiplication, and other methods that are crucial for optimizing disease control and management procedures against shrimp and fish diseases occurring in brackishwater grow-out ponds.

9) Capacity Enhancement on Sustainable Aquaculture and Aquatic Animal Health Management

This activity aims to conduct training courses on sustainable aquaculture, fish nutrition and feed development, and fish health management, to enable farmers in the region to acquire technology and skills on sustainable aquaculture.

2. Background and Justification:

Global fish production was about 171 million tons in 2016, with aquaculture representing 47 % of the total (FAO 2018). With the capture fishery production relatively static since the late 1980s, aquaculture has been responsible for the continuing impressive growth in the supply of fish for human consumption. Asia has accounted for about 89% of world aquaculture production for over two decades. In 2016, five SEAFDEC Member Countries, which are Indonesia, Viet Nam, Myanmar, Thailand and Philippines, were included in the major aquaculture producers whose production exceeds 500,000 tons.

On the other hand, the growth in aquaculture also brought negative impacts into our region such as; degradation of the culture sites, destruction of sensitive ecosystems, decrease in bio-diversity, spread of diseases, social conflicts, etc. All of them hinders the sustainability of aquatic food production. Majority of the repercussions which affect not only the stability of culture production but also stock levels of wild aquatic species and precluding efforts towards food security and poverty alleviation.

Aquaculture Department (AQD) of the SEAFDEC has acquired useful information and developed skills especially in the fields of feed development, culture technology, community-based management for production, fish health management, development of vaccine treatment, protective measures against existing and emerging diseases, and in the conduct of the training courses for aquaculture under the JTF 6 regional program titled “Promotion of sustainable aquaculture and resource enhancement in Southeast Asia”, 2015 - 2019. Those activities should be further strengthened so that the sustainable utilization and management of aquatic resources will be accomplished in responsible manner in the Southeast Asian region. Sustainable aquaculture through cost-effective culture systems and prompt and effective aquatic animal health management would be the wholesome practices towards these goals.

3. Gender Sensitivity of the Project

The study leaders in this project consisted of five males and 6 females. The study leaders were chosen based on their specialty, were not in an arbitrary manner depending on their gender.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives, Impact)	Indicators	Means of Verification
Attaining Sustainable Aquaculture through Cost-Effective Culture Systems and Prompt and Effective Aquatic Animal Health Management	<ul style="list-style-type: none"> - Developed and updated technologies for sustainable aquaculture - Update developed techniques and information on training course - Spread knowledge and skills with training course and journal 	<ul style="list-style-type: none"> - Number of developed strategies and technologies for sustainable aquaculture - Number of Update developed techniques and information on training course - Number of Spread knowledge and skills with training course and journal

OUTCOME	Indicators	Means of Verification
Dissemination of Aquaculture Strategies and Technologies, and Improvement of Aquaculture Production in Southeast Asia	<ul style="list-style-type: none"> - Technology and knowledge on sustainable aquaculture as references for policy planning and aquaculture management - Improved and newly developed production of aquaculture species with the developed strategies and technologies 	<ul style="list-style-type: none"> - Number of view and download of technological manuals and information for sustainable aquaculture on SEAFDEC/AQD homepage - Efficiency of aquaculture production using the developed strategies and technologies
OUTPUT 1	Indicators	Means of Verification
Development of Strategies and Technologies for Aquaculture Production in Southeast Asia	Strategies and techniques in farm to improve aquaculture production.	<ul style="list-style-type: none"> - Government formulated and implemented enabling policies in support of sustainable aquaculture based on guidelines and technologies - Practical realization of developed methods, strategies and guideline
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: Community-Based Hatchery, Nursery, Grow-out of Giant Freshwater Prawn (GFWP) in Laguna Lake and Tributaries	<ul style="list-style-type: none"> - Completed a socioeconomic baseline survey validated by local stakeholders - Constructed and operationalized a community-based GFWP hatchery and nursery, and established collaboration with grow-out farmers - Generated income from sale of GFWP juveniles from nurseries and market-sized GFWP from grow-out cages - Capacitated fisherfolks in aquaculture livelihoods. <p>One (1) community-based hatchery constructed and operational with 50,000 PL initial production capacity per month in Brgy Pipindan, Binangonan, Rizal in 2021, after baseline survey and training in 2020. Minimum of three (3) grow-out farmers in Laguna Lake tributaries trained and operational per year from 2022-2024</p>	<ul style="list-style-type: none"> - Conduct scheduled monitoring of project performance according to proposed activities - Periodic meeting of stakeholders (<i>i.e.</i> fisherfolk organization, local government officers, Laguna Lake Development Authority, DA-BFAR, SEAFDEC/AQD-BFS, and other stakeholders) - Monitor cost, harvest and income in community-based hatchery and nursery operations - Monitor profitability of grow-out operators. - Monitor availability of GFWP in local and Metro Manila markets

ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
<p>Activity 1.2: Promoting Alternative Feeds for Sustainable Production of Freshwater Aquaculture Species</p>	<ul style="list-style-type: none"> - Production of alternative feeds using agricultural wastes and by-products identified in GOJ-TF6 and evaluation for on-farm trials - Continued development of alternative feeds using other local, readily available ingredients for laboratory and on-farm trials - Adoption of the alternative feeds by small-scale fish farmers - Reduced production costs of small-scale fish farmers using alternative feeds and feeding strategies developed and identified in the study 	<ul style="list-style-type: none"> - Other alternative feed ingredients identified and processed for use in the continued development of alternative feeds - Production parameters (e.g. growth, survival, FCR, yield) monitored - Cost and benefits evaluated
<p>Activity 1.3: Ecosystem Approach to a Responsible/Sustainable Shrimp Farming</p>	<p>Aquaculture management plan for small scale shrimp holders/farmers developed</p>	<p>Increased shrimp production of adaptors</p>
<p>Activity 1.4: Development of Aquaculture Techniques on New Aquatic Species for Promotion and Creation of Local Aquaculture Industry</p>	<p>To develop hatchery and grow-out techniques on the breeding, seed production and nursery rearing of kawakawa (<i>Euthynnus affinis</i>), shortfin scad (round scad, <i>Decapterus macrosoma</i>), flathead lobster (<i>Thenus orientalis</i>) and seahorse (<i>Hippocampus comes</i>)</p>	<p>Established seed production and grow-out techniques for adoption of local aquaculture industry</p>
OUTPUT 2	Indicators	Means of Verification
<p>Development of Procedures in Disease Control and Management against Shrimp and Fish Diseases in Southeast Asia</p>	<p>Procedures in disease control and management against shrimp and fish diseases to improve aquaculture production</p>	<ul style="list-style-type: none"> - Government formulated and implemented enabling policies in support of disease control and management based on developed procedures - Practical realization of developed procedures
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
<p>Activity 2.1: Development Diagnosing Procedures Against Emerging Shrimp and Fish Diseases</p>	<ul style="list-style-type: none"> - Comprehensive diagnosis on unknown mortalities of crustacean and fish - Development and optimization of conventional PCR protocol and real time PCR for emerging fish and shrimp diseases - Conduct of susceptibility test on polychaetes against WSSV (Artificial Infection, Histopathology, in situ) 	<ul style="list-style-type: none"> - Diagnosed unknown mortalities of crustacean and fish - Optimized diagnostic protocols for emerging fish and shrimp diseases. - Dissemination of the standardized diagnostic protocol through hands-on training; provision positive control - Preparation of disease cards

ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 2.2: Survey of the Epidemiology, Distribution, Occurrence and Prevalence of EHP.	<ul style="list-style-type: none"> - Surveillance Survival rate, growth rate of shrimp - Procedures of isolation of viability of spores - Mode of transmission Cohabitation, horizontal and vertical transmission 	<ul style="list-style-type: none"> - Active surveillance reports/database - Guidelines to protect shrimp from EHP
Activity 2.3: In Vitro and in Hatchery Investigation of Organisms, Chemicals and Methods to Prevent or Mitigate the Effect of Important Shrimp Diseases	Recommendations and guidelines on organisms, chemicals and methods that can be used to protect shrimp from and/ or mitigate the effect of WSSV, EMS and other important shrimp diseases	List of organisms, chemicals and methods that will lead to less incidence of shrimp disease outbreak in hatchery tank trials
Activity 2.4: Application of Integrated Approaches in the Management of Viral Infections and Other Emerging Diseases in Brackish Water Ponds	2 tank trials and 3 pond trials to be conducted in SEAFDEC/AQD Tigbauan Main Station and Dumangas Brackishwater Station, January 2020- December 2024	<ul style="list-style-type: none"> - Completed preliminary tank trials - Completed successful ponds trials demonstrating the efficacy of the integrated approaches - Recommended procedures for the management of viral and emerging diseases in pond culture
OUTPUT 3	Indicators	Means of Verification
Capacity Enhancement on Sustainable Aquaculture and Aquatic Animal health Management in Southeast Asia	Dissemination of aquaculture strategies and technologies	Carry out training courses on aquaculture
ACTIVITY 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 3.1: Training Course on Sustainable Aquaculture	<ul style="list-style-type: none"> - Promotion of marine aquaculture technologies in the region - Promotion of freshwater aquaculture technologies in rural communities in the region 	<ul style="list-style-type: none"> - Conduct of training course on marine aquaculture in the region - Conduct of training course on community-based freshwater aquaculture in rural communities to introduce alternative livelihood to small-holder fish farmers
Activity 3.2: Training Course on Fish Nutrition and Feed Development	Skills enhancement and dissemination of improved feed development and management practices to ASEAN Member States	Successfully implemented training course to develop skills, disseminate knowledge and new information in feed formulation and feeding management to SEA participants

ACTIVITY 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 3.3: Training Course on Fish Health Management in Aquaculture	Increased capacity to manage aquatic animal diseases among stakeholders in ASEAN Member States	Successfully implemented training courses to disseminate knowledge, skills, and new approaches in fish health management to SEA participants
OUTPUT 4	Indicators	Means of Verification
Progress management of project	Proper practice of the project	Carry out annual progress meeting and international workshop
ACTIVITY 4	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 4.1: Annual Progress Meeting	Hold annual meeting organized by SEAFDEC/AQD to review the project achievement.	- Carry out annual progress meeting - Review and evaluate the project achievements
Activity 4.2: International Workshop	Hold the workshop organized by SEAFDEC/AQD to review the project achievement and exchange brand-new information on aquaculture.	- Carry out international workshop - Updated on the issues related to sustainable aquaculture
Activity 4.3: Coordination by the Project Leader	Coordinate and encourage the research, training and dissemination, and also facilitate information exchange	- Contribute to achieve the project's objectives - Control the budget - Review the overall project achievements on the provided meetings.

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1:																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Activity 1.4																				
Output 2:																				
Activity 2.1																				
Activity 2.2																				
Activity 2.3																				
Activity 2.4																				
Output 3:																				
Activity 3.1																				
Activity 3.2																				
Activity 3.3																				

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 4:																				
Activity 4.1																				
Activity 4.2																				
Activity 4.3																				

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year5 (2024)
Output 1	Activity 1.1	10,000	10,000	10,000	10,000	9,000
	Activity 1.2	10,000	10,000	10,000	10,000	9,000
	Activity 1.3	10,000	10,000	10,000	10,000	9,000
	Activity 1.4	10,000	10,000	10,000	10,000	9,000
Output 2	Activity 2.1	10,000	10,000	10,000	10,000	9,000
	Activity 2.2	10,000	10,000	10,000	10,000	9,000
	Activity 2.3	10,000	10,000	10,000	10,000	9,000
	Activity 2.4	10,000	10,000	10,000	10,000	9,000
Output 3	Activity 3.1	14,000	14,000	14,000	14,000	12,000
	Activity 3.2	8,000	8,000	8,000	8,000	7,500
	Activity 3.3	8,000	8,000	8,000	8,000	7,500
Output 4	Activity 4.1	6,000	6,000	6,000	6,000	0
	Activity 4.2	0	0	0	0	17,000
	Activity 4.3	14,000	14,000	14,000	14,000	14,000
Sub-Total		130,000	130,000	130,000	130,000	130,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 are available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, the following activities will be implemented.

- 1) In 2020, social preparation methods, including baseline social survey and formulation of local regulations, will be applied to enable the implementation of community-based strategies for mass production of giant freshwater prawn (GFWP) juveniles in hatcheries and nurseries. These seeds will contribute to an increase in supply of seeds required by grow-out farms in Laguna Lake and tributaries. Overall, the activity aims to contribute to food and livelihood security through aquaculture.

- 2) Alternative feed(s) identified in the JTF 6 will be used in cage trials using advanced-stage tilapia juveniles as well as the seasonal effect on the growth performance and feed efficiency of Nile tilapia using two feeding strategies (daily and skip feeding) will be studied.

- 3) Organisms that can be used in the constructed/artificial wetlands will be identified. Different organisms will be investigated as to their efficiency to purify pond effluents and ability to grow in a brackish water pond environment. Considering that in the past studies under the JTF project, mangroves have been proven to purify shrimp pond effluents and the use of tilapia greenwater improves shrimp growth and survival. In the project, other organisms that can improve water quality or purify pond effluents will be investigated.

- 4) Survey and procurement of breeders of new aquatic species kawakawa (*Euthynnus affinis*), shortfin scad (round scad, *Decapterus macrosoma*), Flathead lobster (*Thenus orientalis*) and seahorse (*Hippocampus comes*) for developing breeding and seed production techniques will be carried out.

5) Comprehensive diagnosis on unknown mortalities and development of detection methods for the emerging diseases will be conducted. Polychaetes are known to be a major food of several penaeid species. However, there are reports that polychaetes can be also a carrier of WSSV. Hence, the susceptibility test will be conducted in order to elucidate the possibility of polychaetes as a carrier of WSSV and also disinfection protocol will be verified.

6) *Enterocytozoon hepatopenaei* (EHP) is the microsporidian parasite that causes *Hepatopancreatic microsporidiosis* (HPM) in shrimp. Given its current status as an emerging disease and potential spread, active surveillance, distribution, occurrence and prevalence of EHP will be studied in the Philippines.

7) The study will investigate chemicals and methods that can be used to prevent the horizontal and vertical transmission of WSSV and other important shrimp diseases. The efficiency of egg disinfection in fertilized eggs will be investigated. Among the disinfectants to be investigated are electrolysis, iodine, formalin and chlorine; to be used singly or in combination. Preliminary experiments on the artificial insemination or fertilization of *P. monodon* will also be done.

8) Simulation tank trials utilizing previously developed protocols that will lead to an optimized disease control and management strategy against shrimp and other emerging diseases in brackishwater ponds will be conducted.

9) Training on sustainable aquaculture, particularly on rural aquaculture program, will be conducted with participants from SEAFDEC Member Countries as well as training on feed development and fish health management.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome	Dissemination of aquaculture strategies and technologies, and improvement of aquaculture production in Southeast Asia	
Output 1:	Development of strategies and technologies for aquaculture production in Southeast Asia	
Activity 1.1	“Community-Based Hatchery, Nursery, Grow-out of Giant Freshwater Prawn (GFWP) in Laguna Lake and Tributaries” <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Personnel services, technical assistant 20%</i> = US\$ 2,800 • <i>Hired labor, field assistants</i> = 1,500 • <i>Research animals, materials, supplies</i> = 900 • <i>Travel DSA, accommodation, vehicle use/hire</i> = 2,000 • <i>Meetings, workshops</i> = 800 • <i>Capital outlay small hatchery</i> = 2,000 	10,000
Activity 1.2	Promoting Alternative Feeds for Sustainable Production of Freshwater Aquaculture Species <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Personnel services, TA and Research Aide 25%</i> = US\$ 2,700 • <i>Office, laboratory supplies, feed ingredients</i> = 2,000 • <i>Laboratory analysis</i> = 3,000 • <i>Travel, meetings and workshops</i> = 1,000 • <i>Laboratory/ research equipment</i> = 1,300 	10,000

Proposed Activities	Descriptions	Proposed Budget
Activity 1.3	<p>Investigate organisms that can be used in the constructed/artificial wetlands; assessed based on efficiency in removing nutrients from pond effluent and ability to grow/ survive in pond condition</p> <p><i>Estimated expenditure:</i></p> <ul style="list-style-type: none"> • <i>Collection of organisms for investigation</i> <li style="padding-left: 20px;"><i>Organisms</i> = US\$ 200 <li style="padding-left: 20px;"><i>Travel Cost</i> = 1,800 • <i>Laboratory analysis</i> = 3,000 • <i>Technical Assistant</i> = 3,500 • <i>Sundries, office/lab supplies</i> = 200 • <i>Pond rehabilitation</i> = 1,300 	10,000
Activity 1.4	<p>Survey, procurement and development of breeding and seed production techniques for new aquatic species for local aquaculture industry</p> <p>Candidate species for seed production studies are kawakawa (<i>Euthynnus affinis</i>), shortfin scad (round scad, <i>Decapterus macrosoma</i>), flathead lobster (<i>Thenus orientalis</i>) and seahorse (<i>Hippocampus comes</i>)</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 4,000 • <i>Hatchery operation cost</i> = 3,000 • <i>Labor cost in hatchery</i> = 2,500 • <i>Others (communication etc)</i> = 200 	10,000
Output 2:	Development of procedures in disease control and management against shrimp and fish diseases in Southeast Asia	
Activity 2.1	<p>Development of diagnostic procedures against emerging fish and shrimp diseases.</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Personnel services, technical assistant</i> = US\$ 6,500 • <i>Travel cost</i> = 200 • <i>Communication</i> = 100 (<i>telephone, fax, postage, freight</i>) • <i>Supplies and materials</i> = US\$ 1,200 (<i>consumables, goods, and miscellaneous</i>) • <i>Research expenses</i> = US\$ 2,000 (<i>analysis of samples, broodstock, PLs, chemicals, personnel expenditures and miscellaneous</i>) 	10,000
Activity 2.2	<p><i>Enterocytozoon hepatopenaei</i> (EHP) is a recently emerging shrimp pathogen that causes severe growth retardation in shrimps resulting in a disease condition known as <i>Hepatopancreatic microsporidiosis</i> (HPM). Disease surveillance work on shrimp will be carried out for the occurrence of EHP in Philippines. Shrimp samples will be assessed for the presence of EHP using light and scanning electron microscopy, histology, PCR, in situ hybridization and other molecular diagnostic tools.</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Travel cost</i> = US\$ 1,300 • <i>Daily subsistence allowance</i> = 700 • <i>Accommodation</i> = 1,000 • <i>Communication</i> = 100 (<i>telephone, fax, postage, freight</i>) • <i>Supplies and materials</i> = 100 (<i>consumables, goods, and miscellaneous</i>) • <i>Research expenses</i> = 6,800 (<i>analysis of samples, broodstock, PLs, chemicals, personnel expenditures and miscellaneous</i>) 	10,000

Proposed Activities	Descriptions	Proposed Budget
Activity 2.3	<p><i>In Vitro</i> and in Hatchery Investigation of Organisms, Chemicals and Methods to Prevent or Mitigate the Effect of Important Shrimp Diseases</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Electrolytic machine</i> = US\$ 1,200 • <i>Chemicals</i> = 1,200 • <i>Laboratory Analysis</i> = 2,400 • <i>Laboratory supplies</i> = 1,500 • <i>Sundries, office supplies</i> = 200 • <i>Technical Assistant</i> = 3,500 	10,000
Activity 2.4	<p>Application of integrated approaches in the management of viral infections and other emerging diseases in brackish water ponds</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Personnel services, technical assistant 50%</i> = US\$ 2,940 • <i>Research animals, feeds, materials, supplies</i> = 2,600 • <i>Laboratory Analysis</i> = 1,700 • <i>Repair and maintenance of tank facilities</i> = 1,600 • <i>Travel DSA, accommodation, vehicle use/hire</i> = 960 • <i>Sundries, office supplies</i> = 200 	10,000
Output 3:	Capacity enhancement on Sustainable Aquaculture and Aquatic Animal health management in Southeast Asia	
Activity 3.1	<p>Marine and Freshwater aquaculture program</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Travel, DSA, Accommodation, Training fee</i> = US\$ 5,000 • <i>Honoraria</i> = 2,000 • <i>Supplies and materials</i> = 4,000 • <i>Training equipment</i> = 2,300 • <i>Communication</i> = 100 • <i>Food</i> = 600 	14,000
Activity 3.2	<p><i>Training Course on Fish Nutrition & Feed Management</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Travel, DSA, Accommodation, Training fee</i> = US\$ 2,500 • <i>Honoraria</i> = 1,000 • <i>Supplies and materials</i> = 2,000 • <i>Training equipment</i> = 1,800 • <i>Communication</i> = 100 • <i>Food</i> = 600 	8,000
Activity 3.3	<p><i>Training Course on Fish Health Management</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Travel, DSA, Accommodation, Training fee</i> = US\$ 2,500 • <i>Honoraria</i> = 1,000 • <i>Supplies and materials</i> = 2,000 • <i>Training equipment</i> = 1,800 • <i>Communication</i> = 10 • <i>Food</i> = 600 	8,000
Output 4:	Progress management of project	
Activity 4.1	<p>Hold annual meeting at SEAFDEC/AQD</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Travel, DSA, Accommodation, Training fee</i> = US\$ 4,500 • <i>Communication</i> = 100 • <i>Food</i> = 900 • <i>Supplies and materials</i> = 500 	6,000
Activity 4.2	<i>Not applicable</i>	0
Activity 4.3	Coordinate and encourage the research, training and dissemination, and	14,000

Proposed Activities	Descriptions	Proposed Budget
	also facilitate information exchange <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • Personnel services of financial assistant = US\$ 6,000 • Travel cost = 4,000 • Communication = 500 • Equipment = 1,000 • Food = 1,000 • Office Supplies = 1,500 	

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.2												
Activity 1.3												
Activity 1.4												
Output 2:												
Activity 2.1												
Activity 2.2												
Activity 2.3												
Activity 2.4												
Output 3:												
Activity 3.1												
Activity 3.2												
Activity 3.3												
Output 4:												
Activity 4.1												
Activity 4.2												
Activity 4.3												

4. Expected Activity Results in 2020:

Planned activity	Expected Activity Results
Activity 1 Development of Strategies and Technologies for Aquaculture Production in Southeast Asia	
Activity 1.1: Community-Based Hatchery, Nursery, Grow-out of Giant Freshwater Prawn (GFWP) in Laguna Lake and Tributaries	<ul style="list-style-type: none"> • Completed a socioeconomic baseline survey validated by local stakeholders • Established collaboration with fish farmers, local government and related agencies to implement the study • Initiated the construction and conducted GFWP trial hatchery and nursery runs
Activity 1.2: Promoting Alternative Feeds for Sustainable Production of Freshwater Aquaculture Species	<ul style="list-style-type: none"> • Alternative feed(s) for advanced stage tilapia fingerlings identified; information on the seasonal growth performance and feed efficiency of Nile tilapia using two feeding strategies known

Planned activity	Expected Activity Results
Activity 1.3: Ecosystem Approach to a Responsible/Sustainable Shrimp Farming	<ul style="list-style-type: none"> • Identified list of organisms that can purify pond effluent and therefore be used in a constructed wetland • Identified list of organisms that can grow under brackish water pond condition and therefore be used in a constructed wetland
Activity 1.4: Development of Aquaculture Techniques on New Aquatic Species for Promotion and Creation of Local Aquaculture Industry	<ul style="list-style-type: none"> • Identified source of breeders of new aquatic species for promotion and creation of local aquaculture industry • Reproductive biology established and initial trials on the breeding and seed production conducted
Activity 2 Development of Procedures in Disease Control and Management Against Shrimp and Fish Diseases in Southeast Asia	
Activity 2.1: Development Diagnosing Procedures against Emerging Shrimp and Fish Diseases	<ul style="list-style-type: none"> • Diagnosed unknown mortalities • Development diagnostic procedures against emerging shrimp and fish diseases
Activity 2.2: Surveillance and Epidemiology of EHP in Philippines	<ul style="list-style-type: none"> • A list of the penaeid species infected with EHP in Philippines will be generated • A list of prevalence and intensity rate of EHP in penaeid shrimps collected in Philippines be identified
Activity 2.3: In Vitro and in Hatchery Investigation of Organisms, Chemicals and Methods to Prevent or Mitigate the Effect of Important Shrimp Diseases	<ul style="list-style-type: none"> • List of chemicals, organisms, and methods that can be used to disinfect fertilized eggs to prevent the vertical transmission of WSSV • Assessed feasibility of artificial insemination/fertilization in <i>P. monodon</i>
Activity 2.4: Application of Integrated Approaches in the Management of Viral Infections and Other Emerging Diseases in Brackish Water Ponds	<ul style="list-style-type: none"> • Completed preliminary tank trials • Assessment of the practicability of the approaches under farm conditions
Activity 3 Capacity Enhancement on Sustainable Aquaculture and Aquatic Animal Health Management	
Activity 3.1: Training Course on Sustainable Aquaculture	<ul style="list-style-type: none"> • Training course to develop skills and disseminate updated information on hatchery of marine finfishes • Training course on community-based freshwater aquaculture successfully conducted with participants equipped with technical knowledge and skills on breeding, propagation and culture of freshwater aquaculture species
Activity 3.2: Training Course on Fish Nutrition and Feed Development	Training Course to develop skills, disseminate knowledge and new information in feed formulation and feeding management to SEA participants successfully conducted

Planned activity	Expected Activity Results
Activity 3.3: Training Course on Fish Health Management in Aquaculture	Completed training course to disseminate knowledge, skills, and new approaches in fish health management to SEA participants
Activity 4 Progress Management of Project	
Activity 4.1: Annual Progress Meeting	<ul style="list-style-type: none"> • Carry out annual progress meeting • Review and evaluate the project achievements
Activity 4.2: International Workshop	Not applicable
Activity 4.2: Coordination by the Project Leader	<ul style="list-style-type: none"> • Contribute to achieve the project's objectives • Control the budget • Review the overall project achievements on the provided meetings.

PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

			Project ID: 202005004
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Management Scheme of Inland Fisheries in the Southeast Asian Region		
Program Strategy No:	III	Total Period:	2020-2024
Lead Department:	Inland Fishery Resources Development and Management Department (IFRDMD)	Lead Country:	To be identified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 225,000
Project Partner(s):	None	Budget for 2020:	USD 45,000
Lead Technical Officer:	Takuro Shibuno, Deputy Chief / IFRDMD	Project Participating Countries)	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

This project is for the sustainable management and utilization of fisheries resources in the Southeast Asian region. There are two main activities in the project. The first activity programme aims at improving fishers' livelihood. The guidelines on inland fisheries management will be developed and disseminated to the governments and other relevant agencies in Southeast Asia. The second activity programme is to collect the fish catch data and information. The establishment of catch database and profiles of freshwater fish biodiversity will be developed, and a manual book on the collection and sampling of fish biological characteristics will be published.

2. Background and Justification

Inland fisheries are economically important at the national and local level because of their social and economic contributions to the incomes of rural communities. The dynamics of inland fisheries are strongly related to the seasonal rainfall patterns like the rainy season is followed by the dry season. It is noted that the production data of inland fisheries is very limited since inland fisheries operations are small-scale, very seasonal, and mostly carried out by part-time fishers. The production is for domestic consumptions and is usually not recorded at landing sites (SEAFDEC, 2017). The countries have been trying to make their efforts in improving their systems for compiling the data and information on inland fisheries which have a potential to enhance food sufficiency in the region in future.

In the past five-year JTF program from 2015 to 2019, IFRDMD established and strengthened the regional networking for improving the management and conservation of fisheries resources and environment in inland waters in the region. The collection of data and information on the present status of inland fisheries in the Member Countries was carried out by referring to reference materials, websites, interviews and field surveys. IFRDMD was engaged in the capacity development and the improvement of the inland fisheries management in the Member Countries.

IFRDMD will continue to promote the sustainable management and utilization of inland fisheries resources in Southeast Asia. Many people involved in inland fisheries activities as full- or part-time worker are still depending on inland fisheries resources which have been depleting and degrading due to overcapacity, resource access conflicts and inadequate resource management. Improving the livelihood of fishers is a key strategy. Under the project, the historical catch data on freshwater fish will be collected in the region, and the socio-economic status of inland fishers will be also assessed. Further, the status of freshwater fish resources will be monitored and evaluated.

3. Gender Sensitivity of the Project

Gender analysis helps ensure equitable participation of women and men in development processes and projects. Gender defines the roles and responsibilities that women and men have in a given context and culture. As gender varies, such roles and responsibilities vary. In inland capture fishery, women may be responsible for fish processing and marketing, whereas men are responsible for fishing. In this project, the women support the data collection as an enumerator. Therefore, in the 2020-2024 study, it needs to show up the responsibilities of a woman.

4. Project Goal, Outcome-Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives, Impact)	Indicators	Means of Verification
Sustainable management and utilization of inland fisheries resources in the Southeast Asian region	The livelihood of fishers is secured and stable, and the inland fishery diversity is maintained	- Historical by catch data on freshwater fish provided by enumerators - Data on socio-economic status of fishers in the freshwater fish production in Southeast Asia
OUTCOME	Indicators	Means of Verification
Strategic program for improving fishers' livelihood	ASEAN Member States (AMSs) implement the strategic program for improving fishers' livelihood	Government adopts the document and made a policy or regulation
OUTPUT 1	Indicators	Means of Verification
Policy and recommendations of the inland fisheries management in Southeast Asia	Guidelines developed on inland fisheries management in Southeast Asia, and disseminated to governments and other relevant agencies	Government reports and published or issues policy and regulations based on the guidelines
ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.1: Organizing stakeholders' meetings between representatives of relevant Government agencies, fishers, local communities, etc. in AMSs	Meetings conducted in 6 countries (<i>i.e.</i> Cambodia, Indonesia, Lao PDR, Myanmar, Thailand and Viet Nam), and obtaining the present status of data and information on inland fisheries management	- Database from 6 countries - Meeting reports
Activity 1.2: Conducting trainings on data and information in AMSs	Trainings conducted in 6 countries (<i>i.e.</i> Cambodia, Indonesia, Lao PDR, Myanmar, Thailand and Viet Nam), and sharing, exchanging and improving the data and information collections	- Training in 6 countries - Training reports
Activity 1.3: Organizing a regional workshop	Regional workshop organized at IFRDMD to promote the importance of inland fisheries for the livelihood	Workshop report

ACTIVITY 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 1.4: Organizing Forum Group Discussion in AMSs	Forum Group Discussions organized in 6 countries (<i>i.e.</i> Cambodia, Indonesia, Lao PDR, Myanmar, Thailand and Viet Nam) to promote the importance of inland fisheries for the livelihood	Forum Group Discussion reports
Activity 1.5: Conducting a writeshop for drafting publications	A writeshop organized in 6 countries to draft publications of each AMS	Articles
OUTPUT 2	Indicators	Means of Verification
Fish catch data and information assembled	Catch database and profiles of freshwater fish biodiversity established, and fish biological characteristics collecting/sampling manual book published	Catch database and freshwater fish biodiversity profiles, and collecting/sampling manual
ACTIVITY 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 2.1: Conducting a survey to assess the status of inland fisheries	Surveys conducted in 6 countries (<i>i.e.</i> Cambodia, Indonesia, Lao PDR, Myanmar, Thailand, and Viet Nam) for updating status of inland fisheries	Survey reports
Activity 2.2: Conducting data monitoring in target countries	Data monitoring conducted in 3 countries (<i>i.e.</i> Indonesia, Cambodia/Thailand, and Myanmar)	Database from 3 countries
Activity 2.3: Drafting the profiles of freshwater fish biodiversity in AMSs	The profiles drafted and published	Booklet on the profiles of freshwater fish biodiversity
OUTPUT 3	Indicators	Means of Verification
Successful project management through regular monitoring and evaluation	Project achievements	Report of results and evaluation
ACTIVITY 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
Activity 3.1 Project monitoring and evaluation lead by Project Leader undertaken	<ul style="list-style-type: none"> - Progress meetings conducted twice a year to confirm the progress of each activity - The evaluation undertaken at the end of year by experts - One Assistant hired to carry out the project operations and administration effectively 	Semi-annual and annual progress reports, and their evaluation results

4.2 Project Implementation Plan for 2020 - 2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1:																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Activity 1.4																				
Activity 1.5																				
Output 2:																				
Activity 2.1																				
Activity 2.2																				
Activity 2.3																				
Output 3:																				
Activity 3.1																				

4.3 Proposed Budget for 2020-2024

(Unit: USD)

Output	Activities	Year1 (2020)	Year2 (2021)	Year3 (2022)	Year4 (2023)	Year5 (2024)
Output 1	Activity 1.1	16,680	8,100			
	Activity 1.2		8,100	13,875		
	Activity 1.3					13,875
	Activity 1.4				14,100	6,375
	Activity 1.5	3,570	3,600	6,375	6,600	
Output 2	Activity 2.1	13,025	17,100	16,875	3,600	
	Activity 2.2	7,225	3,600	3,375	5,100	6,375
	Activity 2.3				11,100	13,875
Output 3	Activity 3.1	4,500	4,500	4,500	4,500	4,500
Sub-Total		45,000	45,000	45,000	45,000	45,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 is available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, the project on the management scheme of inland fisheries will commence with conducting several meetings, workshops and surveys in Southeast Asia. In the Activity 1.1, several meetings will be conducted in AMSs (*i.e.* Lao PDR, Cambodia, Indonesia, and Viet Nam). A study on the present status of data and information on inland fisheries management will be carried out through the meetings. Under the Activity 1.5, a writeshop on drafting publications for staff of the Member Countries is conducted.

The staff of the countries will have an opportunity to enhance their self-confidence in writing articles for publications and relevant reports and documents on inland fisheries. In the Activity 2.1, IFRDMD will conduct a survey in Indonesia and Myanmar, which is for updating the status of inland fisheries. This activity will be combined with the Activity 2.2, which is a data monitoring. Under the Activity 3, a meeting will be conducted twice a year to confirm the progress and improvement of each activity. The achievements of the study will be evaluated at the end of 2020 by the experts. One Project Assistant will be hired to carry out the project operations and administration effectively.

2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome	Strategic program for improving fishers' livelihood	
Output 1:	Policy and recommendations of the inland fisheries management in Southeast Asia	
Activity 1.1	<p>Organizing the stakeholder meetings between representatives of relevant Government agencies, fishers, local communities, etc. in AMSs (in Cambodia, Myanmar, Indonesia and Lao PDR).</p> <p><i>Meetings conducted in AMSs (Lao PDR, Cambodia, Indonesia, and Viet Nam), and obtaining the present status of data and information on inland fisheries management.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Transportation to AMSs</i> = \$3,800 • <i>Accommodation fees</i> = \$3,360 • <i>Local transport</i> = \$1,120 • <i>DSA</i> = \$4,000 • <i>Meeting package</i> = \$4,100 • <i>Office expenditures and contingency</i> = \$ 300 	16,680
Activity 1.5	<p>Conducting a writeshop for drafting publications (in Cambodia)</p> <p><i>The staffs of AMSs have enhanced their self-confidence in writing the articles for publications and relevant institutional documents of inland fishery.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Transportation to AMSs</i> = \$ 2,000 • <i>Accommodation fees</i> = \$ 240 • <i>Local transport</i> = \$ 200 • <i>DSA</i> = \$ 550 • <i>Meeting package</i> = \$ 300 • <i>Office expenditures and contingency</i> = \$ 280 	3,570
Output 2:	Fish catch data and information assembled	
Activity 2.1	<p>Conducting a survey to assess the status of inland fisheries (in Indonesia and Myanmar)</p> <p>Survey conducted in Indonesia and Myanmar for updating the status of inland fisheries</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Transportation to AMSs</i> = \$ 2,800 • <i>Accommodation fees</i> = \$ 3,000 • <i>Local transport</i> = \$ 2,420 • <i>DSA</i> = \$ 2,520 • <i>Office expenditures and contingency</i> = \$ 600 	13,025
Activity 2.2	Conducting data monitoring in target countries (conduct together with activity 2.1; location in Indonesia and Myanmar)	7,225

Proposed Activities	Descriptions	Proposed Budget
	Data monitoring conducted in Indonesia and Myanmar. <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • Enumerators = \$ 5,000 • Meeting package = \$ 700 • Office expenditures and contingency = \$ 1,525 	
Output 3:	Project management to lead to success	
Activity 3	The project leader will coordinate and assist all researches and dissemination. <i>Progress meetings will be conducted to confirm the improving of each activity. The achievement of this study will be evaluated at the end of year by experts. One Assistant will be hired to carry out the project operations and administration effectively.</i> <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • Travel cost of 2 evaluators (share) = \$ 2,200 • Meeting cost (share) = \$ 300 • Salary of assistant (share) = \$ 2,000 	4,500

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.5												
Output 2:												
Activity 2.1												
Activity 2.2												
Output 3:												
Activity 3												

4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Output 1 Policy and recommendations of the inland fisheries management in Southeast Asia	
Activity 1.1 Organizing the stakeholder meetings between representatives of relevant Government agencies, fishers, local communities, etc. in AMSs	<ul style="list-style-type: none"> • Database from 4 countries • Meeting reports
Activity 1.5 Conducting a writeshop for drafting publications	<ul style="list-style-type: none"> • The article
Output 2 Fish catch data and information assembled	
Activity 2.1 Conducting a survey to assess the status of inland fisheries	<ul style="list-style-type: none"> • Survey reports
Activity 2.2 Conducting data monitoring in target countries	<ul style="list-style-type: none"> • Database from 2 countries

<p>Output 3 Successful project management through regular monitoring and evaluation</p>	
<p>Activity 3.1 Project monitoring and evaluation lead by Project Leader undertaken</p>	<ul style="list-style-type: none"> • Progress meetings conducted twice a year to confirm the improving of each activity • The evaluation at the end of year by experts • One Assistant hired to carry out the project operations and administration effectively

**PROJECT DOCUMENT
PROPOSED ACTIVITIES FOR THE YEAR 2020**

			Project ID: 202001015
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Small-scale Fisheries Management for Better Livelihood and Fisheries Resources		
Program Strategy No:	I	Total Period	2020 - 2024
Lead Department:	Training Department (TD)	Lead Country:	To be indentified
Donor/Sponsor:	Japanese Trust Fund (JTF)	Total Project Budget:	USD 300,000
Project Partner(s):	None	Budget for 2020:	USD 60,000
Lead Technical Officer:	Panitnard Weerawat, Senior Instructor/Researcher / TD	Project Participating Country(ies)	All Member Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

In the Southeast Asia region, the problems faced by small-scale fisherfolks are complex and diverse. The main issues are lack of appropriate fisheries management framework, awareness and knowledge of how to apply a fisheries management tool, dependence on middlemen, lack of stakeholders (including women)' acknowledgement, and catch decrease due to the competitions with commercial or illegal fishing and degradation of the environment and fishing grounds. Given also the already low income of small-scale fishers and the high number of household members, this social group has serious difficulties to keep its traditional occupation. Appropriate local and comprehensive management plan for small-scale fisheries (SSF) must provide adequate solutions to the main problems. One of the main objectives in such a management plan is to support small-scale fishers for improving their income generation while sustaining the nearshore fisheries resources.

This project aims in the sustainable management of SSF for improving the livelihood and well-being of fishers in Southeast Asia. There will be the continuing efforts in strengthening the human resource development and further promoting Ecosystem Approach to Fisheries Management (EAFM) under the project. The lesson learnt based on the application of the EAFM will be shared and used for developing the regional recommendations on the effective implementation of the EAFM in the region. The capability development in support of the implementation of the FAO's Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) for improving the livelihood and well-being of small-scale fishers will be carried out. And also, a study on the status of fisheries socio-economic assistance and on gender assessment will be conducted in the region.

The regional cooperation in fisheries socio-economic development and approach/process should be further strengthened in conjunction with the action plans for supporting the livelihood and well-being of small-scale fishers in the Southeast Asia. Furthermore, the gender integration and empowerment in sustainable fisheries management in the Member Countries in Southeast Asia which include fisheries management processing and value chain will be promoted through the regional and national training courses and human resource development programs throughout the five-year project period.

2. Background and Justification

In reference to the United Nations' Sustainable Development Goals (SDG) 14 "Life below Water", it has been stated clearly that the small-scale fisheries are a vital source of livelihoods for millions, particularly in

developing countries, and provide food and nutrition for billions. Large industrial fleets dominate fisheries management efforts and political interests. Policies need to refocus on addressing the needs and challenges of small-scale fisheries. The SSF Guidelines, adopted by the FAO Member Countries in 2014, provide the global consensus on the principles, good practices and guidance to ensure that small-scale fisheries are sustainable for small-scale fishers, fish workers, and their community and society at large. The SSF Guidelines advocate the need for good collaboration among government agencies, small-scale fishery organizations, fishing communities and other stakeholders. SEAFDEC has been taking in the challenge in the region in support of the implementation of the SSF Guidelines, and actions on the SDGs.

In the “ASEAN-SEAFDEC Resolution on Sustainable Fisheries for Food Security for the ASEAN Region towards 2020” as well as the “Strategic Plan of Action on ASEAN Cooperation on Fisheries 2016-2020”, it is stated that the supply of fish and fishery products in the region need to be sustained to improve food security, facilitate poverty alleviation, and improve the livelihoods of people depending on the harvesting, farming and marketing of fish and fishery products. National fisheries policy, legal and institutional frameworks need to be improved to further support small-scale fishers/farmers with providing alternative livelihood opportunities and implementing the effective management of fisheries through the EAFM which aim at increasing the social and economic benefits to all stakeholders. For better livelihood and resources management in SSF, the project will be implemented for the next five years.

3. Gender Sensitivity of the Project

The project is clearly support on gender integration for all activities with starting the data collecting on socioeconomic with gender dimension. It is a good initiative the project with good information to show gender sensitivities and throughout the project have plan to strengthen the livelihood women and men in equality. Moreover, the project has one activity that focusing on development on gender integration in SSF which include fisheries management processing and value chain through regional/national training courses to promotion of the gender aspect to All State Member Countries to guide them on how to mainstream gender in their project program through capacities building staff on Member Countries about gender concept and gender analysis with is the important tool to integrated gender in to all working program.

4. Project Goal, Outcome, Outputs, Activities, Indicators and Verification:

4.1 Logical Framework

GOAL (Overall Objectives, Impact)	Indicators	Means of Verification
Sustainable management of small-scale fisheries (SSF) for improving the livelihood and well-being of fishers in Southeast Asia	<ul style="list-style-type: none"> - Livelihood and well-being of small-scale fishers are improved and secured - Healthy fisheries resources in Southeast Asia 	<ul style="list-style-type: none"> Data on socio-economic status of fishers in Southeast Asia Data on fisheries resource in SSF
OUTCOME	Indicators	Means of Verification
Strategic programme for sustainable fisheries management in SSF	ASEAN Member States (AMSs) implement the strategic programme for sustainable fisheries management	Government adopts strategic programme and made a policy or regulations
OUTPUT 1	Indicators	Means of Verification
Ecosystem Approach to Fisheries Management (EAFM) is in place in selected pilot sites in the Member Countries	Fisheries management which include human wellbeing become more strengthened in selected pilot sites through the implementation on EAFM	<ul style="list-style-type: none"> - Pilot learning site of Tonglesap - Pilot learning site of sub-transboundary species Thailand-Myanmar

Activity 1	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
<p>Activity 1.1 Regional workshop for developing the implementation plan of activities at pilot sites in the countries</p>	<ul style="list-style-type: none"> - Regional workshop conducted in 2020 - About 25 participants (7 persons from Cambodia, (7 persons from Myanmar and 11 persons from Thailand) are expected to participate in the workshop - Participants are the EAFM core team members in the Member Countries - Pilot sites in the countries identified - Implementation plan of activities developed for Ranong-Koh Song, Thailand-Myanmar and Tonglesap, Cambodia 	<ul style="list-style-type: none"> - Workshop report - 25 numbers of the nationals EAFM core team participate in the workshop - EAFM implementation plan of Tonglesap, Cambodia - EAFM implementation plan of Ranong-Koh Song - Appropriate budget allocated for workshop participations
<p>Activity 1.2 Effective implementation of EAFM as key tool in the pilot sites</p>	<p>EAFM introduced and effectively implemented in the pilot sites Learning site 1: Ranong-Koh Song Thailand -Myanmar</p> <p>Learning site 2: Tonglesap, Cambodia</p>	<ul style="list-style-type: none"> - EAFM for Ranong-Koh Song, Thailand-Myanmar and Tonglesap, Cambodia - e-EAFM materials updated
<p>Activities 1.3 Review of the EAFM implementation results in the pilot sites and the development of Regional Plan of Actions (RPOA) on EAFM</p>	<ul style="list-style-type: none"> - EAFM implementation results reviewed in the pilot sites - Write-shop for drafting Regional Recommendation on EAFM implementation and application 	<ul style="list-style-type: none"> - Review report on EAFM implementation results - EAFM promotion materials - Regional Recommendation on EAFM implementation and application
OUTPUT 2	Indicators	Means of Verification
<p>Capability development in the implementation of the SSF guidelines for improving the livelihood and well-being of small-scale fishers</p>	<ul style="list-style-type: none"> - Survey and capacity development activities conducted - Effective implementation of the SSF guidelines for improving the livelihood and well-being of small-scale fishers - Livelihood and well-being of small-scale fishers secured and stable 	<ul style="list-style-type: none"> - Survey report - Improved technical capacities and knowledge of SEAFDEC staff and government officials as well as fishers in SSF

Activity 2	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
<p>Activity 2.1: Study on the status of fisheries socio-economic assistance, and gender assessment particularly in line with the implementation of the SSF guidelines in Southeast Asia</p>	<ul style="list-style-type: none"> - Study on the status of fisheries socio-economic assistance and gender assessment conducted in the Member Countries in 2021 - Survey questionnaires will be developed, and interviews conducted 	<ul style="list-style-type: none"> - Study report on the status of fisheries socio-economic assistance - Survey questionnaires
<p>Activity 2.2: Strengthening a regional cooperation in fisheries socio-economic development and developing appropriate approach/process in support of the implementation of the SSF guidelines in Southeast Asia</p>	<ul style="list-style-type: none"> - Regional cooperation in fisheries socioeconomic development - Participation in international/regional meetings 	<ul style="list-style-type: none"> - Regional cooperation network - Improved regional cooperation - Meeting reports
<p>Activity 2.3: Regional workshops on action plans for supporting the livelihood and well-being of small-scale fishers in the Southeast Asia</p>	<ul style="list-style-type: none"> - Two regional workshops will be organized in Thailand in 2021 and 2023 - 2 participants from each member country - About 25 participants are expected to be participated in each workshop 	<ul style="list-style-type: none"> - Workshop reports - About 25 participants participate in each workshop, (total of 50 participants for 2 workshops) - Action plans for supporting livelihood and well-being of small-scale fishers - Appropriate budget allocated for workshop participations
OUTPUT 3	Indicators	Means of Verification
<p>Further promotion of the gender integration and empowerment in sustainable fisheries management in the Member Countries in Southeast Asia</p>	<ul style="list-style-type: none"> - Gender integration and empowerment promoted through trainings and intervention (e.g. fish processing and value-adding) - Training programme developed 	<ul style="list-style-type: none"> - Number of trainings and its program - Number of new projects on gender integration and empowerment - Number of new activities in fish processing and value adding

Activity 3	Indicators: key inputs (Number to be conducted, Where, Time)	Means of Verification
<p>Activity 3.1: Capacity development on gender integration in SSF which include fisheries management processing and value chain through regional/national training courses</p>	<ul style="list-style-type: none"> - Two regional and three national training courses on gender integration in SSF in Southeast Asia - Regional training/workshop conducted in Thailand in 2020 and 2014, 2 participants from each member country are expected to participate. Expected number of participants is 25 persons/each course and bring to 50 participants in total of two regional courses. - Two national training courses in inland and coastal fisheries will be conducted in 2021, 2022 and 2023 expected number of participants is 25 persons per each course, bring to 75 persons in total of national training participants. - Technical advice to and follow-ups of the on-going co-management activities in Lao PDR 	<ul style="list-style-type: none"> - Training course reports - Regional training/workshop report - About 25 Number of regional and national training courses, bring to 50 training participants for two regional courses and 50 participants for 2 national training courses - Appropriate budget allocated for training participations - Report on the success of women and other disadvantaged stakeholders in the fisheries management process and value chain - New national or local programs/activities to ensure the opportunity for women and disadvantaged groups - Technical report on co-management activities in Lao PDR
<p>Activity 3.2: Participation in the relevant international/regional forum and national activities/trainings</p>	<ul style="list-style-type: none"> - Participation of SEAFDEC EAFM core team members and other staff in international/regional forum and national activities/trainings - International/regional cooperation strengthened 	<ul style="list-style-type: none"> - Meeting reports - Back-to-Office reports - Newsletter articles - Appropriate budget allocated for meeting participations

4.2 Project Implementation Plan for 2020-2024

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1																				
Activity 1.1																				
Activity 1.2																				
Activity 1.3																				
Output 2																				
Activity 2.1																				
Activity 2.2																				
Activity 2.3																				

Activities	2020				2021				2022				2023				2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 3																				
Activity 3.1																				
Activity 3.2																				

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)
Output 1	Activity 1.1	15,000	0	0	0	0
	Activity 1.2	15,000	28,000	43,000	28,000	38,000
	Activity 1.3	8,500	500	500	500	500
Output 2	Activity 2.1	4,000	4,000	4,000	4,000	4,000
	Activity 2.2	1,000	1,000	1,000	1,000	1,000
	Activity 2.3	0	15,000	0	15,000	0
Output 3	Activity 3.1	15,000	10,000	10,000	10,000	15,000
	Activity 3.2	1,500	1,500	1,500	1,500	1,500
Sub-Total		60,000	60,000	60,000	60,000	60,000

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 is available since the new JTF 6-II activities will commence in 2020.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, the project will continue to focus on strengthening the human resource capability through the application and implementation of the Ecosystem Approach to Fisheries Management (EAFM) into the real situation as the learning sites in Tonglesap, Cambodia, and Ranong-Koh Song of Thailand-Myanmar. The lesson learnt from the project activities in 2019 will be also used to adapt the implementation of the EAFM in 2020. Furthermore, a regional study on the status of fisheries socio-economic assistance particularly as well as the capacity development on gender in SSF which include fisheries management, processing and value chain through regional/national training courses will be carried out in line with the implementation of the SSF Guidelines.

2. Outcome, Outputs and Activities and Proposed Budget:

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Outcome	Sustainable fisheries management through the application of EAFM and promotion of gender equity in small scale and artisanal fisheries in MCs	
Output 1	Implementation of the EAFM in the pilot learning sites	

Proposed Activities	Descriptions	Proposed Budget
Activity 1.1	<p>Conduct of the regional workshop for developing the implementation work plan of activities at pilot sites in the countries</p> <p><i>SEAFDEC will conduct regional workshop in Thailand which object to develop the EAFM implementation work plan for the pilot learning sites of Tonglesap, Cambodia and Ranong-Koh Song, Thailand-Myanmar, there will be 25 participants be invited: 7 persons from Cambodia, 7 persons from Myanmar and 11 persons from Thailand</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • Travelling cost for participants: USD 5,000 • Daily subsistence allowance: USD 4,500 • Accommodation at TD's dormitory: USD 1,250 • Meeting package: USD 4,250 Sub-total USD 15,000 	15,000
Activity 1.2	<p>Effective implementation of the EAFM in the pilot sites. This activity of 1.2 will be composed of sub-activities which follow the implementation work plan from the activity 1.1</p> <p><i>The initial step to implement the EAFM in the pilot learning sites will be taken such as conducting the focus group work meetings for the specific site selection, key stake holders engagement and learning sites' problem identification and analysis, one workshop will be conducted in Cambodia (for the Tonglesap lake and one workshop will be conducted in Thailand for the Ranong-Koh Song Thailand-Myanmar learning site.</i></p> <p><i>Estimated expenditures:</i></p> <p><i>Learning site in Tonglesap lake</i></p> <ul style="list-style-type: none"> • Travelling cost for staff and participants: USD 1,200 • Daily subsistence allowance: USD 2,000 • Accommodation Cambodia: USD 1,250 • Meeting package: USD 2,000 Sub-total USD 6,450 <p><i>Learning site in Ranong-Koh Song Thailand-Myanmar</i></p> <ul style="list-style-type: none"> • Travelling cost for staff and participants: USD 2,000 • Daily subsistence allowance: USD 2,500 • Accommodation Ranong province: USD 1,250 • Meeting package: USD 2,800 Sub-total USD 8,550 	15,000
Activity 1.3	<p>Review of the EAFM implementation results in the pilot sites</p> <p><i>The review of the implementation results of the learning sites in Myanmar, Cambodia and Thailand will be carried out, the report will be published</i></p> <p><i>Estimated expenditures:</i></p> <p><i>Report preparation and printing cost: USD 500</i></p> <p><i>Subtotal USD 500</i></p> <p>Conduction of a one day's consultation workshop for Regional Recommendation on EAFM implementation and application</p> <p><i>SEAFDEC will conduct one day consultation workshop to develop the draft of regional recommendation on EAFM implementation and application. The consultation workshop will be conducted back to back</i></p>	500 8,000

Proposed Activities	Descriptions	Proposed Budget
	<p><i>with the regional workshop activity item 1.1 in Thailand, about 25 participants are expected to involve in the workshop.</i></p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Travelling cost for participants:</i> nil • <i>Daily subsistence allowance:</i> USD 4,500 • <i>Accommodation at TD's dormitory:</i> USD 600 • <i>Meeting package:</i> USD 2,900 • <i>Sub-total</i> USD 8,000 	
Output 2	Capability development in the implementation of SSF guidelines for improving the livelihood and well-being of small-scale fishers	
Activity 2.1	<p>Study on the status of fisheries socio-economic assistance, particularly in the area of micro finance, credit and insurance in the Member Countries in line with the implementation of the SSF guidelines in Southeast Asia SEAFDEC will conduct the survey on fisheries socio-economic in the Member Countries, the data collection will carry out in a country which will be selected to implement the SSF project (or the same countries with Activity 1.2/Act.3.1)</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Travelling cost for SEAFDEC staff: USD 1,500 (airfare 250\$$\times$3prs+car rental 150\$$\times$5days)</i> • <i>Daily subsistence allowance: USD 1,200 (SEAFDEC:50\$$\times$3prsx6days+DOF: 20\$$\times$3prsx5days)</i> • <i>Accommodation for SEAFDEC staff: USD 750 (50\$$\times$3prsx5nights)</i> • <i>Material and others for data collection and analysis: USD 550</i> • <i>Sub-total</i> USD 4,000 	4,000
Activity 2.2	<p>Strengthening a regional cooperation in fisheries socio-economic development and developing appropriate approach/process of fisheries micro finance, credit and insurance for small-scale fishers</p> <p>SEAFDEC's staff will participate in the relevance meeting/workshop in order to gain knowledge and information on fisheries micro finance and insurance for small-scale fishers</p> <p><i>Estimated expenditures:</i></p> <ul style="list-style-type: none"> • <i>Travelling cost for SEAFDEC staff: USD 400</i> • <i>Accommodation: USD 300</i> • <i>Daily subsistence allowance: USD 300</i> • <i>Sub-total</i> USD 1,000 	1,000
Activity 2.3	Regional workshop on action plans for supporting the livelihood and well-being of small-scale fishers in the Member Countries	0
Output 3	Further promotion of the gender integration and empowerment in sustainable fisheries management in SEA and gender empowerment to promote alternative livelihood	
Activity 3.1	<p>Capacity development on gender integration in SSF which include fisheries management processing and value chain through regional training course</p> <p><i>SEAFDEC will conduct regional workshop in Thailand which object to obtain and sharing information and knowledge on gender integration in SSF especially promote SEAFDEC gender analysis toolkit for participant to understand on how to integrate in to their fisheries project. There will</i></p>	15,000

Proposed Activities	Descriptions	Proposed Budget
	<p>be 25 participants be invited: 2 from each Member Countries (20 persons) and 5 persons from SEAFDEC</p> <p>Estimated expenditures:</p> <ul style="list-style-type: none"> Travelling cost for participants: USD 6,000 Daily subsistence allowance: USD 5,400 Accommodation Cambodia: USD 1,800 Meeting package: USD 1,800 <p style="text-align: right;">Sub-total USD 15,000</p>	
Activity 3.2	<p>Participation in the relevant international/regional forum and national activities/trainings</p> <p>SEAFDEC's staff will participate in the relevance meeting/workshop in order to gain knowledge and information on gender integration in SSF, promoting alternative livelihood and value chain.</p> <p>Estimated expenditures:</p> <ul style="list-style-type: none"> Travelling cost for SEAFDEC staff: USD 700 Accommodation: USD 400 Daily subsistence allowance, USD 400 <p style="text-align: right;">Sub-total USD 1,500</p>	1,500
	Total	60,000

3. Implementation Plan of Activities in 2020:

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.2												
Activity 1.3												
Output 2:												
Activity 2.1												
Activity 2.2												
Activity 2.3												
Output 3:												
Activity 3.1												
Activity 3.2												

4. Expected Activity Results in 2020:

Planned activities	Expected Activity Results
Activity 1 Implementation of the EAFM in the pilot learning sites	
Activity 1.1 Regional workshop for developing the implementation plan of activities at pilot sites in the countries	<ul style="list-style-type: none"> 25 numbers of the national EAFM core team participate in the workshop and they will be more strengthened in applying EAFM process.

Planned activities	Expected Activity Results
	<ul style="list-style-type: none"> • The initial draft of the EAFM plans of Tonglesap, Cambodia • The initial draft of EAFM plan of Ranong-Koh Song, Thailand-Myanmar • Regional workshop report
<p>Activity 1.2 Effective implementation of EAFM as key tool in the pilot sites</p>	<ul style="list-style-type: none"> • Reports on EAFM implementation for Tonglesap, Cambodia • Reports on EAFM implementation for Ranong-Koh Song, Thailand-Myanmar • Revision-updated of the E-EAFM training toolkit
<p>Activity 1.3 Review of the EAFM implementation results in the pilot sites and conduct write shop for draft the Regional Plan of Actions (RPOA) on EAFM</p>	<ul style="list-style-type: none"> • Review report on EAFM implementation and lesson learned • EAFM promotion materials such as poster, cartoon booklets, etc. • RPOA on EAFM
<p>Activity 2 Capability development in the implementation of SSF guidelines for improving the livelihood and well-being of small-scale fishers</p>	
<p>Activity 2.1 Study on the status of fisheries socio-economic assistance, particularly in line with the implementation of the SSF guidelines in Southeast Asia</p>	<ul style="list-style-type: none"> • Survey report
<p>Activity 3 Further promotion of the gender integration and empowerment in sustainable fisheries management in SEA and gender empowerment to promote alternative livelihood</p>	
<p>Activity 3.1 Capacity development on gender integration in SSF which include fisheries management processing and value chain through regional/national training courses</p>	<ul style="list-style-type: none"> • Improved technical capacities and knowledge of SEAFDEC staff and government officials as well as fishers in SSF training course reports • Regional training/workshop and national training course report • Report on the success of women and other disadvantaged stakeholders in the fisheries management process and value chain • New national or local programs/activities to ensure the opportunity for women and disadvantaged groups (5) Technical report on co-management activities in Lao PDR
<p>Activity 3.2 Participation in the relevant international/regional forum and national activities/trainings/meetings</p>	<ul style="list-style-type: none"> • Meeting reports • Back-to-Office reports • Newsletter articles

PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

			Project ID: 20206009
Program Category:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	Development of Stock Assessment Methods and Strengthening of Resources Management Measures for Tropical Anguillid Eel in Southeast Asia		
Program Strategy No.:	I	Total Period:	2020 - 2021
Lead Department:	Secretariat (SEC)	Lead Country:	To be indentified
Donor/Sponsor:	Japanese ASEAN Integration Fund (JAIF)	Total Donor Budget:	USD 790,123
Project Partner(s):	None	Budget for 2020:	USD 323,000
Lead Technical Officer:	Isao Koya, Assistant Project Manager for the JTF	Project Participating Country(ies) :	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary

Tropical anguillid eel resources are utilized as direct human consumption worldwide. The demand and use of the tropical anguillid eel resources in Southeast Asia are increasing. For the sustainable resource use of the eel resources, effective resource management measures are urgently required in Southeast Asia. However, appropriate resource management measures have not been developed yet because of limited information and data relevant to the eel biology, catch history and statistics and aquaculture which result with a difficulty to conduct a comprehensive stock assessment of the eel resources stock in Southeast Asia. The two-year first phase project entitled 'Enhancing sustainable utilization and management scheme of tropical anguillid eel resources in Southeast Asia (August 2017 – July 2019)' has been conducted since July 2017 by the Southeast Asian Fisheries Development Center (SEAFDEC) in close cooperation with ASEAN Member States (AMS) to develop eel fishery statistics and data collection system, examine the status of tropical anguillid eel species in AMS, and improve eel aquaculture activities. Under the project, surveys were conducted to collect basic eel fishery statistics and data in selected AMS (*i.e.* Cambodia, Indonesia, Myanmar, Philippines, Thailand and Viet Nam); policy recommendations and guidelines were developed to assist AMS in initiating and improving eel resource management practices in the respective countries; and researches were conducted to improve the survival rate of juvenile eels in aquaculture practices.

At the initial stage, eel fishery statistics and data collection system was not fully operated to obtain all of the required data and information. In order to take effective resources management measures for the sustainable use of tropical anguillid eel species, it is necessary to assess the abundance of eel resources stocks and grasp the appropriate total allowable catch level.

This project is proposed to collect the catch data and biological/ecological information for the estimation of the abundance of eel resources stocks, and to develop mathematical/statistical methods for estimating tropical anguillid eel resources stocks, in order to formulate effective management measures on tropical anguillid eel resources in Southeast Asia.

2. Background and Justification

(a) Current Problem

Through the progress and results of the current (first phase) project implemented by SEAFDEC in close cooperation with AMS, it has become evident that the implemented activities in regard to the management of tropical anguillid eel resources in AMS are still at the initial stage. The trends of stock abundance, areas of distribution, and stock structure of the tropical anguillid eel species are unknown, and consequently a lack of the relevant information prevents AMS from determining the allowable catch limit of tropical anguillid eels. In order to control and manage the eel resources for the sustainable use and long-term persistence, it is necessary for AMS to develop and improve tools/methods for the sound management of the anguillid eel resources.

Globally, the conservation and management of the eel species are currently main issues to be addressed adequately. For example, a lack of proper legal framework results in the failure in eel fisheries management. Legally-binding fisheries management measures specific to the tropical anguillid eels have been so far limited and implemented only in two AMS (*i.e.* Indonesia and Philippines) that restrict exporting the tropical eels at a certain size. It is urgently needed to formulate effective management measures based on eel stock and precious distribution, and diversity in Southeast Asia in continued cooperation and coordination within AMS.

(b) Regionality

Southeast Asia is home to several tropical anguillid eel species (*e.g.* Arai *et al.*, 1999). Eight species/sub-species of the tropical anguillid eels distribute in the Indo-Pacific region. Similar to European eels, American eels, and Japanese eels in their native ranges, the tropical anguillid eels are utilized in Southeast Asia for the direct human consumption locally as well as for the trade globally. The recent listing of European eels in the CITES Appendix II in 2007 as well as the recent export ban of those from the EU member states in 2010 may result in increased exploitation of the tropical anguillid eels. Therefore, it is important for AMS to develop effective management policies and actions for the sustainable use of the tropical anguillid eels in Southeast Asia.

(c) Project History

The two-year first phase project entitled 'Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia (August 2017 – July 2019)' has been implemented since July 2017 by SEAFDEC in close cooperation with AMS to develop eel fishery statistics & data collection system, examine the status of tropical Anguillid eel species in AMS, and improve eel aquaculture activities. Under the project, surveys were conducted to collect basic eel fishery statistics and data in selected AMS, policy recommendations and guidelines were developed to assist AMS in initiating and improving eel resource management practices in respective countries, and researches were conducted to improve the survival rate of juvenile eels in aquaculture practices.

For developing effective resource management measures for tropical anguillid eels, it is essential to develop appropriate methods for assessing a stock of tropical Anguillid eel resources and for estimating the total allowable catch for the sustainable use of the eel resources.

This project will therefore allow AMS to obtain all of the required data and information, such as long-term catch data, precise distributions and diversity, and reliable trade data of each of the tropical anguillid eel species. With these data and information, AMS will be able to estimate, for instance, the allowable catch limit to secure the sustainable use of tropical anguillid eel resources.

3. Gender Sensitivity of the Project

The project is not gender-sensitive but neutral and equalized. Both male and female can participate in all the proposed activities.

4. Project Goal, Outputs, Activities, Indicators and Verification

4.1 Logical Framework

GOAL (Overall Objectives)
The objectives of this project are to collect the catch data and biological/ecological information for the estimation of eel resources stocks, and to develop mathematical/statistical methods for estimating tropical anguillid eel resources stocks in order to formulate effective management measures for the sustainable use of tropical anguillid eels in Southeast Asia.

OUTPUT	Indicator (to measure the project's achievements)	Means of Verification
<p>Outputs 1:</p> <p>In order to estimate resources stock status of the tropical anguillid eel species,</p> <p>1-1 Catch and fishing effort data for anguillid eel species C in AMS are collected.</p> <p>1-2 Biological and ecological data/information of the tropical anguillid eels that contribute to the estimation of eel stock abundance in AMS are collected.</p> <p>1-3 Current distributions of the tropical anguillid eels and their diversities in AMS are identified.</p>	<p>Indicators 1:</p> <p>1-1 Catch and fishing effort data by eel species and region are properly collected.</p> <p>1-2 Biological and ecological data and information are properly collected.</p> <p>1-3 Genetic data and information are properly collected.</p>	<p>Means of Verifications 1:</p> <p>1-1 Confirm that contents of the data include the data suitable for the purpose, such as catch amount by species/by growth stage/by region.</p> <p>1-2 Confirm that the contents of collecting data include characteristics of key habitats and length composition of all stages of eels from the selected fishing ground.</p> <p>1-3 Confirm that the contents of collecting data include several genetic indices for analysis at population level from the eels collected from several locations.</p>
ACTIVITY 1		
<p>Main Activities 1:</p> <p>1-1 To collect data on catches and catch efforts by species and by life history stage (glass eel, and elver/yellow eel) in AMS where eel fisheries occur in order to properly assess stock status. For this purpose, field surveys visiting several places in AMS are conducted to:</p> <p>1-2 To collect field data to better understand biology and ecology, including habitat and its surrounding environment, of the tropical anguillid eel species. Field surveys at several rivers in AMS are conducted to:</p> <p>1-3 To collect genetic data to understand distribution, the level of diversity, and stock structure of the tropical anguillid eel species.</p>		
OUTPUT 2	Indicator (to measure the project's achievements)	Means of Verification
<p>Outputs 2:</p> <p>2-1 Annual catch and CPUE are estimated.</p> <p>2-2 Methods for the comprehensive stock assessment of tropical anguillid eels are developed.</p> <p>2-3 Methods for calculation of allowable catch of tropical anguillid eels are developed.</p>	<p>Indicators 2:</p> <p>2-1 Accurate annual catch and historical CPUE are estimated.</p> <p>2-2 Methods for estimating stock biomass are developed and stock biomass (and trend) is estimated using a developed method.</p> <p>2-3 Methods for estimating allowable catch limit and allowable catch are estimated using developed methods.</p>	<p>Means of Verifications 2:</p> <p>2-1 Review of monthly catch and calculated CPUE by month.</p> <p>2-2 Progress reports and review by experts.</p> <p>2-3 Progress reports and review by experts and managers.</p>
ACTIVITY 2		
<p>Main activities 2:</p> <p>2-1 Analyze catch per unit fishing effort (CPUE), including accurate data collection through regular surveys and selection an appropriate catch effort.</p> <p>2-2 Develop methods for estimating abundance trend of the eel stocks. Making manual for methods of assessment stock on tropical anguillid eel.</p> <p>2-3 Develop appropriate methods for estimating allowable catch limit that will secure sustainable use of tropical anguillid eel resources.</p>		

OUTPUT 3	Indicator (to measure the project's achievements)	Means of Verification
Output 3: 3. Effective management measures based on assessment of tropical anguillid eel stocks are proposed, formulated and centralized/harmonized to secure sustainable use and long-term persistence of tropical anguillid eel resources in AMS.	Indicator 3: 3. Metrology on effective management of the tropical anguillid eels are enhanced and management measures are proposed, formulated in AMS.	Means of Verification 3: 3. Review the project report and confirm that the report includes content on resource management methods, data collection system, technology of assessment resource stock.
ACTIVITY 3		
Main activity 3: 3-1 Examine validities of developed methods of stock assessment for eel resources stocks. 3-2 Disseminate developed methods of the stock assessment of tropical anguillid eel to AMS. 3-3 Develop a manual for AMS to formulate the effective resources management based on the assessment of tropical anguillid eel stocks.		
For the above activities, "Regional Meeting "will be held three times at the inception, mid-term and final of the project period.		

4.2 Project Implementation Plan for 2020 - 2021

Activities	2020				2021			
	1	2	3	4	1	2	3	4
Activity 1.1								
Activity 1.2								
Activity 1.3								
Activity 2.1								
Activity 2.2								
Activity 2.3								
Activity 3.1								
Activity 3.2								
Activity 3.3								

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Total
Output 1	Activity 1.1	104,000	121,498	225,498
	Activity 1.2	77,500	24,650	122,150
	Activity 1.3	36,000	30,550	66,550
Output 2	Activity 2.1			
	Activity 2.2	65,500	68,910	134,410
	Activity 2.3			
Output 3	Activity 3.1			
	Activity 3.2	40,000	70,286	110,286
	Activity 3.3			
Sub-Total		323,000	315,894	658,894
Other budget (management cost and contingency fee)				131,229

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 since this project start at 2020 and project period is January 2020-December 2021.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020

In 2020, the following activities will be carried out in the project

1. Collect catch data /aquaculture production

In order to grasp the catch and aquaculture production of tropical anguillid eels, a system to collect statistical data will be constructed in countries which have eel fisheries / aquaculture.

2. Collect biological data / catch and fishing effort data

In order to assess eel stocks, the system of collecting catch data including fishing effort information on caught directly by fishermen.

3. Collect genetic data

Collect tropical eel genetic data from eel habitats in Indonesia, Myanmar, Philippines and Viet Nam, and conduct research and analysis to clarify population genetic structure.

4. Develop methods for assessment eel stock

Preparations for developing a method for assessment of eel stock based on information on catch and catch effort data will start.

5. Regional Meeting/Planning Meeting

The Regional meeting will be held to share fishing and ecological data and information on tropical anguillid eels between AMS. At this meeting, information will be shared with AMS regarding the status of various data collection, analysis results, and technical methods for resource stock assessment.

The project planning meeting will be held to design the details of the project activities with AMS representatives.

2. Outputs and Activities and Proposed Budget

		(Unit: USD)
Proposed Activities	Descriptions	Proposed Budget
Output 1	Outputs 1: In order to estimate resources stock status of the tropical anguillid eel species, <ul style="list-style-type: none"> • Catch and fishing effort data for anguillid eel species in AMS are collected. • Biological and ecological data/information of the tropical anguillid eels that contribute to the estimation of eel stock abundance in AMS are collected. • Current distributions of the tropical anguillid eels and their diversities in AMS are identified. 	
Activity 1.1	To collect data on catches and catch efforts by species and by life history stage (glass eel, and elver/yellow eel) in AMS where eel fisheries occur in order to properly assess stock status. <i>Fishery / aquaculture statistical surveys will be conducted in AMS.</i> <i>Estimated expenditures:</i> <i>Reward for fishermen to collect catch data and another statistical data</i> <i>= US\$ 30,000</i> <i>Explanation meeting of statistical survey in AMS (6countries)= US\$ 54,000</i> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 4,300 • <i>Daily subsistence allowance</i> = US\$ 1,500 • <i>Accommodation</i> = US\$ 1,700 • <i>Rental /Others</i> = US\$ 1,500 <div style="text-align: right;"> <i>Sub-total</i> = US\$ 9,000 ×6 countries = US\$ 54,000 </div>	104,000

Proposed Activities	Descriptions	Proposed Budget
	<i>Expenditure for entrusting the survey and analysis data to a consultant company/research institute =US\$ 20,000</i>	
Activity 1.2	<p>To collect field data to better understand biology and ecology, including habitat and its surrounding environment, of the tropical anguillid eel species.</p> <p><i>Estimated expenditures:</i> <i>Reward for fishermen for collecting catch data = US\$ 30,000</i> <i>Designing and install fishing gears = US\$ 20,000</i> <i>Designing/Construction/Install/Collecting data survey=US\$ 27,500</i></p> <ul style="list-style-type: none"> • <i>Traveling cost = US\$ 2,500</i> • <i>Daily subsistence allowance = US\$ 1,000</i> • <i>Accommodation = US\$ 1,000</i> • <i>Rental /Others = US\$ 1,000</i> <p style="text-align: right;"><i>Sub-total = US\$ 5,500 ×5times = US\$ 27,500</i></p> <p><i>Design survey(1times), Construction survey (1times), Install of fishing gear (1times), Collecting data survey(2times) = Total 5times</i></p>	77,500
Activity 1.3	<p>To collect genetic data to understand distribution, the level of diversity, and stock structure of the tropical anguillid eel species.</p> <p><i>Expenses for collecting DNA sample and analyzing population genetic structure</i></p> <p><i>Estimated expenditures:</i> <i>eDNA data collection survey =USD\$ 16,500</i></p> <ul style="list-style-type: none"> • <i>Traveling cost = US\$ 2,500</i> • <i>Daily subsistence allowance = US\$ 1,000</i> • <i>Accommodation = US\$ 1,000</i> • <i>Rental /Others = US\$ 1,000</i> <p style="text-align: right;"><i>Sub-total = US\$ 5,500×3times =16,500US\$</i></p> <p><i>Analysis of DNA for sequencer processing</i></p> <ul style="list-style-type: none"> • <i>Sequencer processing = US\$ 15,000</i> <p><i>Population genetic structure study</i></p> <ul style="list-style-type: none"> • <i>Traveling cost = US\$ 2,000</i> • <i>Daily subsistence allowance = US\$ 1,000</i> • <i>Accommodation = US\$ 1,000</i> • <i>Rental /Others = US\$ 500</i> <p style="text-align: right;"><i>Sub-total = US\$ 4,500</i></p>	36,000
Output 2		
Activity 2.1 Activity 2.2 Activity 2.3	<ul style="list-style-type: none"> • Analyze catch per unit fishing effort (CPUE), including accurate data collection through regular surveys and selection an appropriate catch effort. • Develop methods for estimating abundance trend of the eel stocks. <p>Making manual for methods of assessment stock on tropical anguillid eel.</p> <ul style="list-style-type: none"> • Develop appropriate methods for estimating allowable catch limit that will secure sustainable use of tropical anguillid eel resources. • • In order to carry out these activities, the analysis of catch data and biological data is entrusted to consultant companies/research institutions. <p><i>Estimated expenditures:</i> <i>Consignment expenses to consultants /research institute =US\$ 65,500</i></p>	65,500
Output 3	Effective management measures based on assessment of tropical anguillid eel stocks are proposed, formulated and centralized/harmonized to secure sustainable use and long-term persistence of tropical anguillid eel resources in AMS.	
Activity 3.1	<ul style="list-style-type: none"> • Examine validities of developed methods of stock assessment for eel resources stocks. 	40,000

Proposed Activities	Descriptions	Proposed Budget
Activity 3.2 Activity 3.3	<ul style="list-style-type: none"> Disseminate developed methods of the stock assessment of tropical anguillid eel to AMS. Develop a manual for AMS to formulate the effective resources management based on the assessment of tropical anguillid eel stocks. <i>The Regional Meeting and the Planning Meeting will be held to carry out activities 3-1 ~ 3-3.</i> <p><i>Estimated expenditures:</i></p> <p><i>Planning Meeting:</i></p> <ul style="list-style-type: none"> Traveling cost = US\$ 8,500 Daily subsistence allowance = US\$ 4,000 Accommodation = US\$ 3,500 Rental /Others = US\$ 2,500 Sub-total = US\$18,500 <p><i>Regional meeting</i></p> <ul style="list-style-type: none"> Traveling cost = US\$ 9,000 Daily subsistence allowance = US\$ 5,000 Accommodation = US\$ 4,500 Rental /Others = US\$ 3,000 Sub-total = US\$21,500 	

3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.2												
Activity 1.3												
Output 2:												
Activity 2.1												
Activity 2.2												
Activity 2.3												
Output 3:												
Activity 3.1												
Activity 3.2												
Activity 3.3												

4. Expected Activity Results in 2020:

Planned activity	Expected Activity Results
Activity 1. Activity 1.1. To collect data on catches and catch efforts by species and by life history stage (glass eel, and elver/yellow eel) in AMS where eel fisheries occur in order to properly assess stock status.	<ul style="list-style-type: none"> Describe major fishing grounds of tropical anguillid eels (all stages). Collect catch and fishing effort data to estimate the abundance of tropical anguillid eel resources stocks through catch information by fishers from regional fishing ground. Collect catch and fishing effort data to estimate the abundance of tropical anguillid eel resources stocks by conducting quantitative surveys using specific fishing gears at selected fishing grounds.

Planned activity	Expected Activity Results
	<ul style="list-style-type: none"> Identify discrepancy of data, and its reasons, between international trade databases (UN, FAO, etc.) and domestic catch statistics/actual fishery catch.
<p>Activity 1.2. To collect field data to better understand biology and ecology, including habitat and its surrounding environment, of the tropical anguillid eel species.</p>	<ul style="list-style-type: none"> Collect biological/ecological data by conducting quantitative survey using specific fishing gears at selected fishing grounds. Analyze length composition of the eels in order to examine biological and life history characteristics of the tropical anguillid eels in several sites in AMS.
<p>Activity 1.3. To collect genetic data to understand distribution, the level of diversity, and stock structure of the tropical anguillid eel species.</p>	<ul style="list-style-type: none"> Conduct genetic analysis to identify local and regional biodiversity of the tropical anguillid eels Conduct genetic analysis to address current spatial structure of the tropical anguillid eels for the genetic stock identification
Activity 2.	
<p>Activity 2.1. Analyze catch per unit fishing effort (CPUE), including accurate data collection through regular surveys and selection an appropriate catch effort.</p>	<ul style="list-style-type: none"> The trends of eel resources and stock assessment using the collected catch / CPUE data will be analyzed.
<p>Activity 2.2. Develop methods for estimating abundance trend of the eel stocks. Making manual for methods of assessment stock on tropical anguillid eel.</p>	<ul style="list-style-type: none"> Development of methods for assessment eel resources stock and the creation of a technical manual will be started.
<p>Activity 2.3. Develop appropriate methods for estimating allowable catch limit that will secure sustainable use of tropical anguillid eel resources.</p>	<ul style="list-style-type: none"> The examination of the method to estimate the allowable catch by assessment of eel resources stock will be started.
Activity 3.	
<p>Activity 3.1. Examine validities of developed methods of stock assessment for eel resources stocks.</p>	<ul style="list-style-type: none"> Attempts will be made to validity the developed resource assessment methods technique.
<p>Activity 3.2. Disseminate developed methods of the stock assessment of tropical anguillid eel to AMS.</p>	<ul style="list-style-type: none"> Stock assessment techniques and catch information of tropical anguillid eel will be disseminated to AMS through regional meetings.
<p>Activity 3.3. Develop a manual for AMS to formulate the effective resources management based on the assessment of tropical anguillid eel stocks.</p>	<ul style="list-style-type: none"> Preparation of a manual on effective resource management methods for tropical anguillid eel will be examined.

Annex 6

SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES FOR THE YEAR 2019-2020

I. Aquaculture Department (Appendix 1)

Programs/Projects	2019	2020	Appendix no.
1. Quality Seed for Sustainable Aquaculture	Y	Y	2
2. Healthy and Wholesome Aquaculture	Y	Y	3
3. Maintaining Environmental Integrity through Responsible Aquaculture	Y	Y	4
4. Meeting Social and Economic Challenges in Aquaculture	Y	Y	5
5. Adapting to Climate Change	Y	Y	6
6. Priority and Special Projects	Y	N	
7. Collaborative Projects with the Philippine Government	N	Y	7

II. Training Department (Appendix 8)

Programs/Projects	2019	2020	Appendix no.
1. Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building	Y	Y	9
2. Improving of Fisheries Technology and Reduction of the Impact from Fishing Activities	Y	Y	10

III. Aquaculture Department (Appendix 11)

Programs/Projects	2019	2020	Appendix no.
1. Stock Assessment in Inland Fisheries	Y	Y	12
2. Development of Capacity Building Plan to support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules and Conducting Training of Trainers on EAFM/EAA	Y	N	13
3. Improve Livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence	Y	Y	14
4. Modernizing Irrigated Agriculture to Protect and Restore Aquatic Biodiversity and Ecosystem Services in South-East Asia	Y	Y	15

**Overall Review
of the Departmental Program Implementation in the Year 2019**

AQUACULTURE DEPARTMENT(AQD)

1. Quality Seed for Sustainable Aquaculture

A sustainable supply of good quality seedstock is key to a successful aquaculture enterprise. Rearing quality seedstock to commercial sizes require efficient husbandry techniques and suitable farm conditions to achieve increased yield. With the intensification of aquaculture systems in several Southeast Asian countries and the environmental challenges such as those resulting from climate change, development and use of quality farmed broodstock and adoption of optimal culture management methods are equally important in ensuring a steady production of seeds and later, marketable aquaculture products

The program consists of 18 research studies that focus on broodstock development, refinement of hatchery and nursery protocols, increase awareness on available genetically selected/improved stocks to optimize its use for improved on-farm aquaculture production, and promotion of technically- and economically-viable breeding and seed production schemes.

To achieve the main objective of developing and managing quality broodstock for use in either commercial fish farming and/or stock repopulation, stock characterization using molecular markers were utilized in previous years to aid in determining genetic quality in wild and hatchery stocks. This year, information on the reproductive biology, mating/breeding behavior, and production traits in traditional and emerging aquaculture species (giant grouper) help formulate suitable broodstock management protocols. Nutritional intervention is being done as well to improve reproductive traits. Abalone, mangrove crab, tiger shrimp, Indian prawn, sandfish, tilapia, native catfish, silver perch, giant grouper, and Anguillid eels are the species being studied for the development of better breeding stocks.

To increase production and rearing of larval and juvenile stages of important aquaculture species, mechanisms that: (a) enhance laboratory production of natural food organisms, *e.g.* algal paste production, and alternative food items, *e.g.* polychaetes, which serve as early stage diets; as well as (b) improved rearing conditions and interventions that allow the aquatic organisms to adapt and survive well during larval development, are evaluated.

A genetic improvement research initiative for two species (mangrove crab and abalone) was done. The mangrove crab project aimed to produce fast-growing and diseases-resistant lines while abalone project focused on improving breeding performance. AQD, through this program, is continuing the in-house production of good quality seeds for both mangrove crab and abalone.

2. Healthy and Wholesome Aquaculture

This program has two main components: fish health and nutrition and feed. Fish health concentrates on disease diagnosis, control, monitoring and surveillance of aquatic animals; and environmental integrity, certification, and food safety. While nutrition and feed component conducts studies to address some problem and need areas to sustain the production of aquaculture products in the region.

The following are the major accomplishment of the program under the fish health component: (a) tilapia samples for Tilapia Lake Virus (TiLV) detection were collected and were observed for mortalities; (b) the effective concentration of emamectin benzoate (EMB) on pompano was determined; (c) whiteleg shrimp was also culture using biofloc system with sludge removal facility; and (d) diseases in seaweeds in different sites across the country were monitored through sampling.

As for the nutrition and feed component, the research studies that were conducted are aligned to the objectives under the program. For the high-value species pompano (*Trachinotus blochii*), the effective level of spray dried hemoglobin as alternative protein source in the dietary formulation was determined as well as the requirement for some essential amino acids. Also, the response of tiger shrimp when fed different dietary levels of the algae *Chaetomorpha* as fermented, unfermented or as a fresh meal was determined. The culture of hatchery-bred *Penaeus indicus* in ponds would yield information on the effectivity of using a feed formulated for low-value fish species.

3. Maintaining Environmental Integrity through Responsible Aquaculture

SEAFDEC/AQD has been developing aquaculture techniques for various species of finfish, crustaceans, mollusks, and some new emerging species to boost production in the Philippines and other countries in Southeast Asian region and taking the lead in looking into the impacts of the aquaculture activities to the environment. There are six studies under this program which aims to develop environment-based aquaculture technology by integrating environmental factors.

Experiments on strategic feeding for milkfish were conducted to reduce feed input for effective marine cage culture. Production technologies for oysters were also verified by comparing growth and survival in pond culture system and open river system. An environment-friendly culture method for abalone was also conducted by using perforated PVC and fed with seaweeds. Disease-free polychaete culture in raceway ponds was conducted with results showing its bioremediation potential. Technical skills in community-based production of sea cucumber were improved starting from effectively testing the best microalgae feed. This was followed by running nursery-rearing experiments to produce sandfish early juveniles.

4. Meeting Socio-economic Challenges in Aquaculture

This program generally aims to develop and implement social and economic strategies in aquaculture and resource management to secure food and income through stakeholder collaboration.

For 2019, the program successfully operational the abalone and sandfish hatchery component of the Community-Based Resource Enhancement (CBRE) project in Brgy Molocaboc in Sagay Marine Reserve in Negros Occidental, Philippines. With the success of the CBRE in Sagay Marine Reserve, its replication is ongoing in Lahuy Island in Caramoan, Camarines Sur, Philippines. Site assessment, baseline sampling of wild abalone and sandfish, consultation with fisherfolks, traders and local government stakeholders had been conducted. Since the project is nearing its conclusion, capacity-building activities were conducted for the local sea ranchers through demo-training and actual operation exercises. Preliminary consultation for turn-over of the CBRE release site and hatchery for abalone and sandfish has been initiated.

Seven Integrated Multi-Trophic Aquaculture (IMTA) milkfish mariculture runs implemented through community-based approach have been completed since 2015 and on its final run it harvest a total of 92.8% of harvest. Through the sustainable livelihood assets (SLA) analysis, it showed that the community improved from four (human, environmental, financial, and social assets) out of five categories.

5. Adapting to Climate Change

The program generated scientific information on the effects of high water temperature on reproductive performance and recruitment of economically important aquaculture commodities. Information on the impacts of climate change were also incorporated in all SEAFDEC/AQD training courses and extension efforts.

6. Collaborative Projects with the Philippine Government

SEAFDEC/AQD aims to streamline its research and development program to focus more on enhanced technology-transfer of mature technologies for food security and poverty alleviation.

Projects with the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR) are on its way to accelerate fish production and export revenues in aquaculture sector. Through the projects, the industry and stakeholders can lessen the dependence on imported milkfish fry and increase its seed production. Through the program “*Oplan Balik Sugpo*,” the shrimp industry is on its way for revival as AQD’s shrimp hatchery produced disease-free fry already.

AQD also partnered with National Fisheries Research and Development Institute (NFRDI) to develop sustainable and low-cost feeds. Low-cost feeds successfully formulated feeds costing Php 19-22/kg (with Php 4-6 kg production costs) which is relatively lower compared to the average cost of commercial feed which is around Php 34-36/kg. Field testing was conducted with promising results.

**SEAFDEC Departmental Programs of Activity
For The Year 2019-2020**

AQUACULTURE DEPARTMENT

1. Overall Review

Research and development (R&D) that helps address the national and regional agenda (ASEAN) on food security while at the same time protects the environment has remained to be our priority at the Aquaculture Department of Southeast Asian Fisheries Development Center (SEAFDEC/AQD). With over four decades of R&D, AQD has generated and transferred a number of viable and science-based aquaculture technologies which are now being applied for the farming of several commercially important commodities (marine and freshwater fishes, shrimps, crabs, shellfishes, seaweeds) in the Philippines and elsewhere in the region.

For 2018, SEAFDEC/AQD has implemented 37 studies under five thematic Programs which focus on: (i) Quality Seed for Sustainable Aquaculture, (ii) Healthy and Wholesome Aquaculture, (iii) Maintaining Environmental Integrity through Responsible Aquaculture, (iv) Meeting Social and Economic Challenges in Aquaculture, (v) Adapting to Climate Change Impact, (vi) Collaborative Projects with the Philippine Government.

Activities in these programs involve research, verification and demonstration of aquaculture technologies in the priority areas of broodstock development and seed production, farming systems and ecology, nutrition and feed development, fish health management, and socio-economics. Apart from research and verification studies, significant efforts were made to facilitate the transfer of viable technologies to various stakeholders through training and information dissemination. Activities comprised the conduct of international/local training and other institutional capacity building programs, participation of researchers in scientific conferences, various technology fora and exhibitions, and publication of information materials.

2. List of Projects

1. Quality Seed for Sustainable Aquaculture
2. Healthy and Wholesome Aquaculture
3. Maintaining Environmental Integrity through Responsible Aquaculture
4. Meeting Social and Economic Challenges in Aquaculture
5. Adapting to Climate Change
6. Collaborative Projects with the Philippine Government

PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Quality Seed for Sustainable Aquaculture
Responsible Department: Aquaculture Department
Total Duration: 2016-2020
Funding Sources: AQD
Estimated Budget for 2020: USD 686,627

1. INTRODUCTION

A sustainable supply of good quality seedstock is key to a successful aquaculture enterprise. Rearing quality seedstock to commercial sizes require efficient husbandry techniques and suitable farm conditions to achieve increased yield. With the intensification of aquaculture systems in several Southeast Asian countries and the environmental challenges such as those resulting from climate change, development and use of quality farmed broodstock and adoption of optimal culture management methods are equally important in ensuring a steady production of seeds and later, marketable aquaculture products.

2. PROJECT

2.1 Goal /Overall Objectives

Generate, verify and promote technologies to ensure the sustainable production of quality seed stock for aquaculture as well as for stock enhancement.

The specific objectives are to:

- (1) develop good quality broodstock for both traditional and emerging species
- (2) improve quality and production of seedstock through the refinement of hatchery and nursery management methods;
- (3) develop schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks; and
- (4) produce sufficient seedstock through the adoption of economically viable seed production systems

2.2 Outcomes and Expected Outputs

The program is expected to achieve the following:

- (1) production of good quality broodstock;
- (2) increased seed stock production through the availability and adoption of refined and efficient hatchery and nursery protocols
- (3) if available, promote genetically selected and improved stocks and apply techniques to optimize their use to improve on-farm aquaculture production
- (4) enough supply of seeds from major aquaculture commodities through the adoption of technically- and economically-viable breeding and seed production schemes

2.3 Project Description/Framework (for total duration of the project)

The program focuses on studies and activities that determine optimal conditions and cost-effective, science-based methods for the production of quality seedstock. Conventional methods of enhancement of breeding performance, from (a) stock improvement *e.g.* domestication, broodstock management, strain evaluation and selective breeding or genetic improvement; (b) nutritional interventions such as formulation of broodstock diets and larval nutrition schemes; and (c) other non-genetic/environmental interventions *e.g.* hormone application, temperature and water depth in manipulation for shrimp broodstock for traditional and emerging freshwater and marine species are approaches being adopted. Studies using biotechnological tools such as DNA markers have been completed in the previous year while some were used in screening newly domesticated aquaculture species such as Anguillid eels. In the case of Anguillid eels, genetic markers have been utilized to simply identify species and characterize genetic stocks with the ultimate objective of later on understanding genetic connectivity in wild stocks of Anguillid eels both in the Philippines and Indonesia (part of phase 2 proposal to JAIF).

As mentioned, suitable hatchery and nursery protocols are being developed and refined depending on the level of technology for each species. These technologies are verified and are packaged into the most viable or cost-effective method for broodstock and seed production. Once ready for dissemination, industry stakeholders or primarily the fish farmers shall be informed of advances in seed production methods through training and the production of information, education and communication or (IEC) materials such as technical manuals.

Activity 1: Broodstock development

To achieve the main objective of developing and managing quality broodstock for use in either commercial fish farming and/or stock repopulation, stock characterization using molecular markers were utilized in previous years to aid in determining genetic quality in wild and hatchery stocks. This year, information on the reproductive biology, mating/breeding behavior, and production traits in traditional and emerging aquaculture species (giant grouper), help formulate suitable broodstock management protocols. Nutritional intervention is being done as well to improve reproductive traits. Abalone, mangrove crab, tiger shrimp, Indian prawn, sandfish, tilapia, native catfish, silver perch, giant grouper and Anguillid eels are the species being studied for the development of better breeding stocks.

Activity 2: Refinement of hatchery and nursery protocols

To increase production and rearing of larval and juvenile stages of important aquaculture species, mechanisms that: (a) enhance laboratory production of natural food organisms, e.g. algal paste production, and alternative food items, e.g. polychaetes, which serve as early stage diets; as well as (b) improved rearing conditions and interventions that allow the aquatic organisms to adapt and survive well during larval development, are evaluated.

Activity 3: Increase awareness on available genetically selected/improved stocks and optimize their use for improved on-farm aquaculture production

This is done either through the development and evaluation of selected breeds commercially available or otherwise. Once such stock or strains are noted as superior then the same can be promoted to farmers for use with the end-goal of being able to increase on-farm fish yield.

Activity 4: Promotion of technically and economically-viable breeding and seed production schemes

It is not enough to disseminate information on innovative and technically feasible breeding and seedstock production methods. One has to ensure that such methods are cost effective thus can generate increased profit for the hatchery/nursery farm operator. The objectives for this activity can be achieved if the technologies that are based on science are verified on farm and will in the process, demonstrate economic viability.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project/Activity Title	Duration	Remarks
Broodstock development		
<p><u>Domestication and strain evaluation</u></p> <p>Catfish Philippine native catfish (<i>Clarias macrocephalus</i>/<i>C. batrachus</i>) Broodstock Development and Management</p> <p>A. Evaluation of reproductive traits for selection and propagation of quality catfish broodstock B. Development of least cost catfish broodstock maturation diet</p> <p>A study on the Philippine native Clariid catfishes (mainly <i>Clariid macrocephalus</i> and <i>C. batrachus</i>) that focuses on broodstock development and management continued in 2019. Renewed interest on the propagation of the native catfishes was due to the fact that they are disease resistant, can be stocked at high densities and thrive in areas where water quality is not optimal. As such, the native catfish can be said to be an ideal culture species especially at a time when climate change has posed numerous challenges to freshwater fish farming.</p> <p>Stocks from three sources, namely Zambales, Quezon and Iloilo collected in 2018 are being maintained for use in broodstock development and broodstock diet trials. Of the three founder stocks,</p>	<p>2018-2019</p>	<p>Another stock either from Kidapawan or Aparri, Cagayan will be collected to enable strain comparison/evaluation</p>

Project/Activity Title	Duration	Remarks
<p>only catfish breeders from Zambales spawned successfully. The broodstock diets that have been tested initially on the Zambales founder stocks contained 0.5% mango peel, 0.5% paprika and a combination of both. Preliminary results using mature <i>C. batrachus</i> from Iba, Zambales showed higher relative fecundity (28.3 and 28.6 eggs/g BW female, respectively) from those fed feeds containing either 0.5% mango peel or the combination of mango peel and paprika. However, hatching rate was noted to be higher (86.3%) in the treatment fed the diet with paprika alone. Meanwhile, the stock from Quezon was subjected to induced spawning trials thrice but did not result to any spawns, nor surviving hatchlings (for one trial). On the other hand, the stocks from Iloilo are growing very sluggishly, hence are not large enough nor mature for spawning.</p> <p>Offspring from the Zambales stock (now with known ages) are being reared for use later in stock evaluation/comparison looking at breeding efficiency and response to broodstock diets. To optimize use of the Zambales F1 stocks which are currently being on-grown to mature sizes, some of the juveniles were set up for a grow-out feeding experiment using an invasive alien species (black mussel) as feed attractant and as an additional source of crude protein.</p> <p>The formulated diets tested consisted of the following: diet 1-fishmeal based catfish diet (Coniza, <i>et al.</i>, 2003) as control; diet 2-okara (soy pulp) based diet without black mussel and; diet 3-okara (soy pulp) based diet with 10% dried black mussel. Dried black mussel is known to have a high crude protein content at 69% (CA, SEAFDEC/AQD). Results of this feeding trial (Sayco and Romana-Eguia, unpublished) showed that stocks that were fed diet 3 gave the highest specific growth rate (1.32±0.18%/day) while the lowest (0.92±0.18 %/day) was that of the stock fed the okara-based diet.</p>		
<p><u>Environmental and nutritional intervention to improve broodstock performance</u></p> <p>Silver therapon (<i>Leiopotherapon plumbeus</i>) Domestication of silver therapon (<i>Leiopotherapon plumbeus</i>)</p> <p>A. Nutritional evaluation of wild-sourced and hatchery-bred stocks for feed development</p> <p>B. Reproductive performance of wild- and hatchery-bred silver therapon</p> <p>In 2019, the effect of dried thraustochytrid biomass supplementation on reproductive performance of 3-year old broodstock of the silver therapon was examined in a tank-based feeding trial. The treatment groups having three replicates each consisted of: (1) control [basal diet; 50% crude protein], (2) basal diet + 0.5% dried thraustochytrid biomass, and (3) basal diet + 1.0% dried thraustochytrid biomass). Hatchery-reared silver therapon broodstock (16.9-17.7 g) were stocked at 30 individuals per cage (1F:2M sex ratio) in three replicate suspended net cages (1 m length × 1 m width × 1.5 m depth) per treatment. Broodstock were fed diets at 2% of body weight for 14 weeks. Fish were sampled every 2 weeks to monitor weight gain and adjust the feed ration. After 14 weeks of feeding, females and males were paired at a sex ratio of 1F:2M per spawning tank of 60-L capacity for hormone-induced spawning trials using a mixture of 10 IU hCG g⁻¹ BW and 0.5 mL ovaprim kg⁻¹ BW. The effect of dried thraustochytrid biomass supplementation were examined on the basis of growth, survival, and reproductive performance (spawning success, fecundity, gonadosomatic index, fertilization and hatching rates). Female silver</p>	mid-2015 to 2019	

Project/Activity Title	Duration	Remarks
<p>theraponbroodstock fed 0.25% thraustochytrid biomass and control diets had higher spawning success than those fed 0.5% thraustochytrid biomass diet.</p> <p>Although results did not show significant differences among the treatment groups, those fed the diet with 0.25% thraustochytrid biomass had higher gonadosomatic index (GSI), fertilization and hatching rates compared to those fed 0.5% thraustochytrid biomass and control diets. These results suggest that supplementation of thraustochytrid biomass at 0.25% could enhance the reproductive performance of female silver theraponbroodstock.</p>		
<p>Tiger shrimp (<i>Penaeus monodon</i>) Effects of water depth, temperature and methyl farnesoate on the mating behavior and reproductive performance of black tiger shrimp (<i>Penaeus monodon</i>) broodstock</p> <p>To best understand conditions that encourage and facilitate mating in the tiger shrimp, experiments that would determine differences and problems in breeding performance of male and female spawners from captive and wild environments (stocked separately and/or their combination as mates) were conducted. Video documentation on the reproductive behavior (pursuit of females by males and vice versa and number of mating episodes) of adult <i>Penaeus monodon</i> during trials separately exposing spawners to varying depths (1 m vs 1.5 m) and temperature (fluctuating ambient and 32°C) were done. Use of methyl farnesoate (a hormone that could induce female crustacean molting and reproduction) on captive shrimps, was done in 2019.</p> <p>Based on the video recordings, molted females were observed to be pursued by males. Wild males spent more time near females than captive males. Captive females were noted to molt longer than wild females in ambient temperature. Wild and captive stocks exit the molt or shell almost at the same time. There is no significant difference in the courtship behavior among the four trial combinations (wild F x wild M, wild F x captive M, captive F x wild M and captive F x captive M) in the fluctuating ambient and 32°C temperature levels for the 1 m depth experiments.</p> <p>On the other hand, there is a significant difference in the courtship behavior of <i>P. monodon</i> between the two temperature levels at 1.5 m depth.</p>	<p>2019</p>	<p>Trials on the effect of methyl farnesoate are yet to be completed and requires 3-6 more months to finish the experiments</p>
<p><u>Broodstock management, breeding protocol development for other species (for stock management and enhancement)</u></p> <p>Giant grouper Breeding and seed production of giant grouper (<i>Epinephelus lanceolatus</i>)</p> <p>Activities continue to be implemented for a giant grouper study focused on developing technologies for giant grouper aquaculture. Through this study, giant groupers were observed to directly undergo male sexual maturity from juvenile phase, and through sex change from functional females, as diandricprotogynous hermaphrodites. Furthermore, females were noted to mature at an average of 23.5 kg body weight (BW) while males mature at 17.5kg BW compared to stocks in Viet Nam where female giant groupers were observed to mature at an average size of 33.5kg and male giant groupers at 34.3 kg.</p>	<p>2015-2019</p>	

Project/Activity Title	Duration	Remarks
<p>Induced ovarian development was performed in the giant grouper juveniles through intramuscular injection and oral administration of rgg FSH (follicle stimulating hormone). However, this was possible only until the cortical alveolar stage and after this, sex reversal would ensue.</p> <p>The reproductive cycle of giant groupers peaks during full moon, thus induced spawning activity is best performed at this time. Spawning induction in giant groupers in the floating sea cage was achieved using SEAFDEC/AQD protocols where slow-release GnRH was implanted four days before full moon and then HCG injection was performed two days before full moon.</p> <p>This study likewise looked at the appropriate larval food for giant groupers. Inclusion of <i>Proales</i> during the first 10 days of rearing results in significantly higher larval survival rate.</p> <p>Another component of the study looked at sperm cryopreservation. The viability of grouper sperm can be prolonged through cryopreservation in liquid nitrogen or in a -80°C biofreezer. In terms of sperm motility, motility is better retained in cryopreserved tiger grouper sperm while long-term fertilization capacity was only confirmed in giant groupers. Generally, viability remains despite a total loss in sperm motility. Initial results in evaluating suitability of Ficoll 70 as additive to the MPRS-DMSO (9:1 v/v) sperm extender at -80°C storage showed a dose-dependent effect in terms preserving viability. However, addition of Ficoll 70 does not positively affect motility conservation, which only lasted up to one month of cryopreservation.</p> <p>This project also successfully developed hybrids which are known to have improved growth and disease resistance. The project also plans to use sterile hybrids to apply surrogate technology in giant grouper production.</p>		
<p><u>Production of nonconventional feed ingredients for use in broodstock diets</u></p> <p>Mudworm Economic viability of tank based polychaete culture technology</p> <p>In the study “Economic viability of tank based polychaete culture technology,” aimed to produce uniformly sized polychaetes in tanks using optimal nursery and grow-out protocols. Polychaete production facilities have been improved. Production is on-going using 500 broodstock in each 1 m² tank. Once achieved, the economic viability of indoor tank-based polychaete culture will be demonstrated.</p>	2016-2019	Other species (<i>Perinereis</i> and <i>Composetiasp</i>) are currently being maintained.
Refinement of Hatchery and Nursery Protocols		
<p>Anguillid eel (<i>Anguilla marmorata</i> and <i>A. bicolor pacifica</i>) Domestication of the Philippine native eel <i>Anguilla</i> sp. (Teleostei: Anguillidae)</p> <p>A study to determine the feasibility of nursing Philippine native glass eels in captivity was started in late 2017 and continued until July 2019. In addition to developing an appropriate rearing protocol of this fish species through provision of suitable feeding scheme and/or formulated diets for nursing glass eels and young elvers, identification of anguillid eels based on morphological and genetic characterization and potential pathogens in nursery eel systems were conducted. Experiments involving the assessment of pre-weaning diet for glass eels showed that <i>Tubifex</i> sp. or bloodworm was better than both <i>Artemia nauplii</i> and artificial diets. Meanwhile in terms of diet form, a moist paste diet gave</p>	mid-2017 to mid-2019	

Project/Activity Title	Duration	Remarks
<p>high glass eel survival compared to those given dry and semi-moist diets. The stocks used for the feeding trials which came from batches of glass eels collected in 2017 and 2018 were morphologically and genetically identified. Analysis of 2018 Aparri samples enabled the identification of 96 pcs of <i>Anguilla marmorata</i> among the stock, aside from four (4) <i>A. luzonensis</i>. Samples from General Santos City in Mindanao which were pre-sorted as <i>A. bicolor pacifica</i> based on visual examination from source, were validated as 100% <i>A. bicolor pacifica</i> based on cytB sequence alignments. Apart from mtDNA sequence analysis, seven microsatellite primers used in Anguillid species were successfully tried on the Philippine Anguillid eel samples and the protocols for cross-amplification and microsatellite analysis were optimized.</p> <p>The glass eels and the rearing water from surveyed eel nursery farms were monitored for the presence of pathogens. Bacterial analysis of the water samples as well as parasite identification and load in the fish samples were also conducted. The pathogens identified were ectoparasites (<i>Trichodina</i> spp.), monogeneans (<i>Ichthyophthirius multifiliis</i>) and bacteria (<i>Aeromonas</i> spp., <i>Pseudomonas</i> spp., and <i>Vibrio</i> spp.). Risk factors were noted and prevention, control and treatment measures were recommended.</p>		
<p><u>Improvement of rearing protocols</u></p> <p>Mangrove crab (<i>Scylla serrata</i>) Use of algal paste in the larval rearing of mangrove crab <i>Scylla serrata</i></p> <p>For ease in the hatchery rearing of mangrove crab seedstock, the use of algal paste in rotifer cultures for mangrove crab seed production was evaluated. Higher rotifer counts were noted when live <i>Nanochlorum</i> was used as feed. When live <i>Tetraselmis</i>, <i>Tetraselmis</i> algal paste from AQD and a commercial <i>Tetraselmis</i> algal paste were compared, the number of rotifers produced were highest in those fed the <i>Tetraselmis</i> algal paste from AQD. Meanwhile, when crabs were fed rotifers that subsisted on <i>Nanochlorum</i> culture, <i>Tetraselmis</i> culture, <i>Tetraselmis</i> paste from SEAFDEC/AQD and commercial <i>Tetraselmis</i> paste, growth was highest in those that were fed rotifers that were given <i>Nanochlorum</i> batch cultures.</p>	<p>2018-2019</p>	
<p>Sandfish <i>Holothuria scabra</i> Optimizing hatchery production of early juvenile sandfish <i>Holothuria scabra</i></p> <p>The sandfish hatchery facility was improved, that is aeration filters were installed, sandfilter system was upgraded, autoheating system was installed. Broodstock were acquired from three sources, namely Concepcion, San Lorenzo, Sagay and Igang. Sixteen spawning episodes (from February to September) were recorded. The target production of 20,000 early juveniles per batch was achieved, one in February and the next, in June. Low sandfish juvenile survival noted in the hatchery production was attributable to fluctuating temperature, lack of larval food and low salinity.</p> <p>Technology brochures on sandfish hatchery and nursery operations have been published. An updated hatchery manual is under preparation. Collation of best protocols and practices is being done.</p>	<p>2018-2019</p>	
<p>Sandfish <i>Holothuria scabra</i> Assessment of tank-based nursery system of sandfish <i>Holothuria scabra</i></p>	<p>2017-2019</p>	

Project/Activity Title	Duration	Remarks
<p>To optimize growth and survival of sandfish juveniles to 20 g fingerling size, rearing is divided into two nursery phases: primary nursery phase for early juveniles (3 g) and secondary nursery phase for late juveniles (3 g to > 20 g).</p> <p>This study aims determine the optimal rearing conditions for primary nursery system for early juvenile sandfish in tank-based floating <i>hapas</i> and evaluation of the rearing performance of secondary nursery system for late juvenile sandfish in tank-based floating <i>hapas</i>. Survival of sandfish juveniles was noted to be 56% after one month rearing in <i>hapa</i> in tanks at 250 sandfish/<i>hapa</i> stocking rate. Growth was about 0.02 g/day. For the second nursery phase, a preliminary experiment focused on the adoption of supplemental feeding was conducted. This study was done using three feed types: milkfish fry mash, shrimp PL feed, <i>Sargassum</i> powder (SP), and a control with no supplemental feed. Three replicate bins with sediments were used for each treatment and control. The best supplemental feed was the milkfish fry mash where the growth of sandfish was 0.1 g/day.</p>		
<p><i>Tigriopus</i> sp. Development of techniques for sustainable mass production of harpacticoid copepods for marine fish and crustacean larviculture</p> <p>This study aimed to investigate and describe the life cycle of <i>Tigriopus</i> sp., determine and establish optimal culture conditions for <i>Tigriopus</i> mass production. The life cycle of <i>Tigriopus</i> was successfully monitored and described. Meanwhile, the conditions for <i>Tigriopus</i> mass production have yet to be optimized.</p>	2019	
<p>Pompano Utilization of artificial illumination in floating net cages on the nursery culture of pompano <i>Trachinotus blochii</i>: Effects on the growth and survival of pompano and its added economic value</p> <p>This study was conducted to (a) develop alternative and cost-effective nursery rearing techniques for the pompano, (b) determine the effect of artificial illumination on prey selectivity of pompano and subsequently, on pompano growth and survival and (c) determine the effect of artificial illumination on the abundance of zooplankton in floating net cages. Results showed that artificial lighting at night improved pompano growth in the nursery. Reduction of feeding by 75% with formulated diets was possible in the first 75 days of culture and up to 50% feed reduction can be done until 95 to 105 days of culture.</p>	2017-2019	
<p>Seaweed (<i>Kappaphycus</i> sp.) Production of <i>Kappaphycus</i> plantlets</p> <p>This study aims to demonstrate the production of <i>Kappaphycus</i> propagules in land-based nursery laboratory and in sea based nursery cages. In 2019, the production target was achieved with 44 batches of propagules produced/ year. The seasonality of on-grown tissue plantlets have been defined. The characteristics (especially carrageenan quality) of plantlets grown at different pH and salinity levels have been noted.</p>	2017-2019	

Project/Activity Title	Duration	Remarks
<p><u>Production of alternative natural food organisms for hatchery and nursery rearing of commercially important aquatic species</u></p> <p>Algal paste Optimization of electrolytic flocculator for paste production of important locally available microalgae in aquaculture</p> <p>This study aimed to establish optimal conditions for the production of algal paste through electrolytic flocculation using important, locally available microalgal strains/species in aquaculture by manipulating the following factors in the design/operation of the flocculator: (a) current/power source; (b) salinity; and (c) the flocculator's metal component. The pastes produced were assessed in terms of viability, length of storage and metal residues (e.g. lead or Pb) that may be found in the paste.</p> <p>Preliminary culture and scale up of algae was done for diatom <i>Chaetoceros calcitrans</i>. Results show the potential of <i>C. calcitrans</i> for mass production and subsequently for algal paste production as it can easily be mass produced in 4 days. Trials on Artemia being fed rice bran plus <i>C. calcitrans</i> paste were compared with Artemia fed live <i>C. calcitrans</i> showed that the algal paste feeding resulted to better growth in brine shrimp. Lead content in the paste is reduced by 97% via manipulation of settings (number of anode or cathode and voltage) using a variable voltage flocculator. Meanwhile, lead residue levels were examined in the brine shrimp that were fed the algal paste with reduced lead content. Levels of lead in the brine shrimp were reduced by 77. Finally, the best storage conditions for the algal paste are provided best by the use of a freezer followed by the use of either a chiller or an airconditioned room.</p>	<p>2018-2019</p>	
<p><u>Development of a modified continuous culture system for natural food production</u></p> <p>Larval food Development of a modified continuous culture system for the mass production of <i>Nanochlorum</i> sp. and <i>Brachionus rotundiformis</i></p> <p>This study aimed to (a) determine pH and substrate and nutrient concentration for <i>Nanochlorum</i> species in batch culture, (b) determine turnover rate to achieve stable and sustainable algal culture, (c) determine biochemical composition at different turnover rates, and (d) reduce cost of producing live food in fish and crab hatcheries.</p> <p>Preliminary experiments comparing <i>Nanochlorum</i> sp. cell growth under different pH levels showed significantly high cell growth at pH 8.0 while the lowest is at pH 6.0. Cell size on the other hand, was highest at pH9.0 and the lowest was again at pH 6.0.</p>		
<p>Milkfish (<i>Chanos chanos</i>) Developing transport techniques for milkfish <i>Chanos chanos</i> juveniles</p> <p>In the milkfish, a study that aims to develop a protocol in transporting milkfish juveniles (with an average total length of 5-6 inches) from the nursery to sea cage facilities was completed this year. This experiment hoped to define optimal temperature and salinity requirements for the transport of milkfish juveniles. The study likewise included trials on the suitable conditioning period of confinement in cages in ponds before the juveniles are transported to milkfish sea cage farming sites. Results showed that milkfish juveniles (5-7 inches) can be transported for up to 12 hours in a closed system under various salinities, temperatures and</p>		

Project/Activity Title	Duration	Remarks
their combinations, with minimal mortalities. The conditioning period of confinement prior to juvenile transport showed the best result for the 4-week period and the least favorable result was those conditioned for 1 day. As for the effect of 2 phenoxy-ethanol (PE) as sedative during actual juvenile transport, it was noted that juvenile survival did not differ among treatments as survival was comparable in treatments that have 2 fish/L, 4 fish/L, 4 fish/L plus 50 ppm PE and that of 6 fish/L plus 50 ppm PE.		
Increase awareness on available genetically selected/improved stocks and optimize their use for improved on-farm aquaculture production		
Mangrove crab and abalone The genetic improvement research initiatives that have been completed are on two species, the abalone and the mangrove crab. The mangrove crab project aimed to produce fast growing and disease resistant lines while the abalone project focused on improved breeding performance through strain comparison/evaluation and other beneficial traits such as growth.		
Promotion of technically and economically-viable breeding and seed production schemes		
Abalone Seed production of donkey's ear abalone <i>Haliotis asinina</i> juveniles Under this program, large-scale production of abalone is being conducted since 2008. The aims of this study were to (a) increase juvenile yield to 5% by the application of interventions such as feeding, appropriate diatom strain, supplementation with microparticulate diet, application of anesthetics for early harvesting of juveniles, (b) determine effect of seaweed quality on broodstock and larval performance and, (c) demonstrate large scale production of abalone using refined AQD methods. Results showed that the improvement in target yield to 5% was achieved through increased diatom feeding.	2008-2019	Abalone juvenile production shall continue, technology dissemination through training will also continue
Mangrove crab Seed production of mangrove crab A total of 3.3 million newly hatched larvae and 383,160 pcs of Crablets were sold. The monetary value of all the crabs sold was Php 1,913,740 (USD 37,026).	2018-2019	

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
All aforementioned study will continue in 2020. New studies on <i>Anabas testudinaeus</i> (e.g. breeding and seed production), mudcrabnutrigenomics, and milkfish genomics will be proposed.	2020	

4.2 Expected Outcomes/Outputs

With the continuation of several studies from 2019, all activities especially those involving emerging species e.g. giant grouper, Anguillid eels, *Anabas testudinaeus*, among others will be studied. New information shall be generated and hopefully, science-based technologies shall be developed and disseminated. Advance scientific research such as those dealing with genetics/genomics shall provide novel approaches in producing quality seedstock, and in developing feeds for nursery rearing that are formulated either for improved growth and/or resistance to diseases.

PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Healthy and Wholesome Aquaculture
Responsible Department: Aquaculture Department
Total Duration: 2016-2020
Funding Sources: AQD
Estimated Budget for 2020: USD 663,443

1. INTRODUCTION

The concept of healthy and wholesome aquaculture is an integral component in improving and sustaining aquaculture production to provide the protein needs of an escalating human population. Research and development efforts in aquaculture have resulted in phenomenal growth of the sector in the last four decades, but more problems need to be studied and solved to attain significant improvements and assure sustainability for future generations in the face of many challenges posed by ecological, economic, and climatic changes, among others, happening in our world today.

This program has two main components: fish health and nutrition and feed. Fish health concentrates on disease diagnosis, control, monitoring and surveillance of aquatic animals; and environmental integrity, certification, and food safety. While nutrition and feed component conducts studies to address some problem and need areas to sustain the production of aquaculture products in the region.

2. PROJECT

2.1 Goal /Overall Objectives

Fish health component aims to improve aquaculture production through innovations in nutrition and feeding and fish health management in aquaculture and in maintaining the environmental integrity of aquaculture systems.

Nutrition and feed component aims to (a) find effective alternative protein sources to fish meal in dietary formulations; (b) to determine specific nutrients that enhances growth performances; and (c) to promote practices and strategies to improve production.

2.2 Outcomes and Expected Outputs

Fish health component is expected to:

- (1) promotion of the wider use of conventional diagnostic as well as new methods especially for newly reported, emerging diseases;
- (2) finding an effective alternative safe drugs/chemical (including natural products) to manage aquaculture diseases in lieu of harmful chemicals and drugs which have been discouraged or banned for use due to quality and safety issues;
- (3) re-education of stakeholders and develop the capability of fish health specialists on fish disease diagnosis using gross clinical examination and bacteriology, mycology, parasitology and histopathology techniques;
- (4) enhancement of the stakeholders and fish health specialists' understanding and interpretation of molecular diagnostic techniques and to develop healthy broodstock through pathogen exclusion; and
- (5) promotion of the group implementation of BMP/GAP and certification of small-scale farmers in the region and incorporate FAO Technical Guidelines to Aquaculture Certification into national aquaculture certification schemes and development of regional standards as well as promotion of global standard for responsible supply certification system

For 2019, nutrition and feed component conducted research studies which are aligned to the objectives under the program. For the high value species pompano (*Trachinotus blochii*), the effective level of spray dried hemoglobin as alternative protein source in dietary formulation will be known and the requirement for some essential amino acids. Also, the response of tiger shrimp will be determined when fed different dietary levels of the algae, *Chaetomorpha*, as fermented, unfermented or as a fresh meal. The culture of hatchery-bred *Penaeus indicus* in ponds would yield information on the effectivity of using a feed formulated for low value fish species.

2.3 Project Description/Framework

Fish health component

Activity 1: *Detection, quantification, and viability of Tilapia Lake Virus (TiLV) in pond soil and water as influenced by water quality parameters and culture management*

The study detects and quantifies TiLV in pond soil, water, and fish samples using quantitative reverse transcription PCR (qRT-PCR). TiLV risk and protective factors will be identified by correlating water quality parameters (temperature, dissolved oxygen, pH, ammonia, transparency, water depth, salinity) with TiLV loads in pond soil/water/ fish samples.

Activity 2: *Efficacy of different therapeutants against Caligus sp. infestation in tropical fish under laboratory conditions*

The study evaluates the efficacy and determines the effective dose of different chemotherapeutants (emamectin benzoate, hydrogen peroxide and onion) against pre-adult and adult sea lice in pompano.

Activity 3: *Production of Penaeus vannamei using Biofloc System with sludge removal facility (SRF) to demonstrate the productivity of old earthen ponds during the wet season*

The study runs for 18 months and demonstrates the production of *Penaeus vannamei* using Biofloc System with sludge removal facility in old earthen brackishwater ponds during the wet season, and illustrates the economic benefits of using the system.

Activity 4: *Safeguarding the future of the Seaweed Industry of the Philippines: Disease and Pest Detection*

The study identifies the key diagnostic tools (detection protocols and molecular diagnostic tools) for yield-limiting seaweed diseases and pests (e.g. epiphytes and endophytes) associated with cultivation sites and the wider environment; and compiles a central open access database and national biobanks leading to an open access, digital 'Atlas' (Shore, DAPS).

Nutrition and feed component

Activity 5: *Quantitative amino acid requirements of pompano (Trachinotus blochii)*

The requirement for essential amino acids of a high value aquaculture species was conducted. The quantitative requirement of pompano, *Trachinotus blochii* for leucine, isoleucine and histidine was started this year. Test diets have been formulated to contain different levels of the specific amino acid. Feeding trials are on-going.

Activity 6: *Spray dried hemoglobin powder meal as an alternative protein source in pompano diets*

Spray dried hemoglobin powder meal is a good source of protein. This was initially used in the formulation for grouper diet as an alternative protein source. The experimental fish was unavailable and with unpredictable production, pompano *Trachinotus blochii*, was used instead. The study will determine the proximate, amino acid, and fatty acid composition of hemoglobin meal as well as determine the digestibility of hemoglobin meal in a carnivorous fish. It will be followed by an efficacy evaluation of the meal when used as an ingredient in pompano diets. It will be evaluation in terms of performance parameters, feed efficiency, and comparative body composition (amino acid, proximate, and fatty acid profile).

Activity 7: *Evaluation of unfermented, fermented and live green macroalgae Chaetomorpha linum as food source for farmed Penaeus monodon*

The use of *Chaetomorpha* seaweed as food source, either through inclusion in formulated feeds or by direct feeding through co-culture system, can potentially benefit culture shrimps and possibly other farmed aquatic species. The study will optimize the fermentation protocol of *Chaetomorpha* meal. Unfermented *Chaetomorpha* meal will also be fed as diet to shrimp and tilapia, and milkfish juveniles hence, this study will determine the animal's survival and growth parameters. The study will also evaluate and estimate the nutrient digestibility of the meal among the aforementioned commodities.

Activity 8: *Hatchery production and semi-intensive pond culture of Penaeus indicus*

The hatchery production and semi-intensive pond culture of *Penaeus indicus* were conducted with the aim to compare growth using *P. indicus* feeds (34-40%) and low-cost tilapia feeds (28-35%) and to demonstrate the profitability of *P. indicus* semi-intensive pond culture.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project/Activity Title	Duration	Remarks												
Fish health component														
<p>Tilapia Detection, quantification, and viability of Tilapia Lake Virus (TiLV) in pond soil and water as influenced by water quality parameters and culture management</p> <p>A total of 1,541 tilapia samples for TiLV detection were collected from various farms in Taal Lake, Laguna de Bay, Pampanga and Calauan, Laguna for Tilapia from May 2019 to July 2019.</p> <p>Eleven of the samples came from a cage with previously observed mortalities. Clinical signs observed in tilapia samples are erratic swimming, bilateral exophthalmia, enlarged spleen, pus in eyes, brain erosion and degradation, hemorrhages on the skin and base of pectoral and dorsal fin, bloated abdomen and ascites. <i>Streptococcus</i> sp. and <i>Vibrio</i> sp. were isolated from the fish samples.</p>														
<p>Pompano Efficacy of different therapeutants against <i>Caligus</i> sp. infestation in tropical fish under laboratory conditions</p> <p>A study was conducted to evaluate the efficacy and determine the effective dose of different chemotherapeutants (emamectin benzoate, hydrogen peroxide, and onion) against pre-adult and adult sea lice in pompano under laboratory conditions.</p> <p><i>Caligus</i> sp. was exposed to different concentrations (0, 25, 50, 100, 200, 400, 800 ppb) of emamectin benzoate (EMB). Preliminary results showed that 400 and 800 ppb of EMB were effective against the parasite.</p>														
<p>Whiteleg shrimp Production of <i>Penaeus vannamei</i> using Biofloc System with sludge removal facility (SRF) to demonstrate the productivity of old earthen ponds during the wet season</p> <p><i>P. vannamei</i> were cultured in two ponds, using biofloc system with sludge removal facility and fed with commercial pellet. Commercial probiotics were used during water culture and during culture. At DOC 42, average body weight is 7.77 g; survival rate is 91.15%.</p>														
<p>Seaweed Safeguarding the future of the Seaweed Industry of the Philippines: Disease and Pest Detection</p> <p>A sentinel farm was identified and is located in Brgy. Tiabas, San Dionisio, Iloilo. Environmental parameters monitoring and monthly biomass sampling were done.</p> <p>Seaweed, <i>Kappaphycus striatus</i>, sampling was done in three sites in Zamboanga, namely: Layag-layag, Tigtabon, and Arena Blanco. Occurrence of disease and pests (epiphytes and ice-ice) were monitored during sampling. Occurrence (%) of disease or pest during sampling is presented in the table below.</p> <table border="1" data-bbox="193 1848 965 2027"> <thead> <tr> <th data-bbox="193 1848 496 1921">Disease/pest occurrence</th> <th data-bbox="496 1848 651 1921"><i>Layag-layag</i></th> <th data-bbox="651 1848 805 1921"><i>Tigtabon</i></th> <th data-bbox="805 1848 965 1921"><i>Arena Blanco</i></th> </tr> </thead> <tbody> <tr> <td data-bbox="193 1921 496 1973">endophytes</td> <td data-bbox="496 1921 651 1973">3.0</td> <td data-bbox="651 1921 805 1973">3.6</td> <td data-bbox="805 1921 965 1973">11.2</td> </tr> <tr> <td data-bbox="193 1973 496 2027">ice-ice</td> <td data-bbox="496 1973 651 2027">0</td> <td data-bbox="651 1973 805 2027">0.4</td> <td data-bbox="805 1973 965 2027">5</td> </tr> </tbody> </table>	Disease/pest occurrence	<i>Layag-layag</i>	<i>Tigtabon</i>	<i>Arena Blanco</i>	endophytes	3.0	3.6	11.2	ice-ice	0	0.4	5		
Disease/pest occurrence	<i>Layag-layag</i>	<i>Tigtabon</i>	<i>Arena Blanco</i>											
endophytes	3.0	3.6	11.2											
ice-ice	0	0.4	5											

Project/Activity Title				Duration	Remarks
macrophyte(Ulva)	0	7.7	0.8		
red seaweed	0	1.2	0		
Nutrition and feeds component					
Pompano Quantitative amino acid requirements of pompano <i>Trachinotus blochii</i> The test to quantify the requirements of pompano for leucine, isoleucine and histidine started this year. Test diets have been formulated to contain different levels of the specific amino acid. Feeding trials is currently on-going. This project will take about two years as amino acid studies needed longer period to undertake.					
Pompano Spray dried hemoglobin powder meal as an alternative protein source in pompano diets Pompano was also used as experimental fish to test if <i>spray dried hemoglobin powder meal</i> can be a good source of protein. This was previously used as protein source for grouper but due to the unpredictability of its production, researchers opted to use pompano. A growth experiment using spray dried hemoglobin for pompano was conducted for 90 days. Results were expected to be reported at the end of 2019.					
Tiger shrimp, milkfish, and tilapia Evaluation of unfermented, fermented and live green macroalgae <i>Chaetomorpha linum</i> as food source for farmed <i>Penaeus monodon</i> Survival and growth of tiger shrimp (<i>Penaeus monodon</i>) juveniles fed with diets containing unfermented <i>Chaetomorpha</i> meal was completed. Growth in terms of %WG and SGR of shrimps fed 0 to 10% inclusion remained comparable up to 120 DOC (days of culture) indicating that the inclusion of unfermented <i>Chaetomorpha</i> meal of up to 10% does not adversely affect shrimp growth. The experiment on Apparent Nutrient Digestibility of <i>Chaetomorpha</i> in shrimp is on-going. A control diet (CD) as well as two reference diets (RFs) were formulated. The algae <i>Chaetomorpha</i> is about 15% crude protein which can be used as feed ingredient after fermentation as it would enhance its levels of nutrients. The protocol on optimization was completed. Partial counts indicated that although the highest total number of particles (TNP) at 1.83 x 10 ⁸ particles/mL was produced using an enzyme concentration of 750 µL per 100 mL base material and incubation period of 60 min, lower concentrations can be effective as well. Final interpretation of the results will be presented after the completion of the count. The efficacy of unfermented <i>Chaetomorpha</i> meal for other species was also conducted by incorporating this material in diets for juvenile tilapia and milkfish. The feeding experiment on milkfish is on-going.					
Indian white prawn Hatchery production and semi-intensive pond culture of <i>Penaeus indicus</i> Feed is an important component in the production of <i>Penaeus indicus</i> in pond as feeding with a feed formulated for a low value fish might increase its production.					

Project/Activity Title	Duration	Remarks
<p>The hatchery production and semi-intensive pond culture of <i>Penaeus indicus</i> were conducted with the aim to compare growth using <i>P. indicus</i> feeds (34-40%) and low-cost tilapia feeds (28-35%) and to demonstrate the profitability of <i>P. indicus</i> semi-intensive pond culture.</p> <p>Stocking of PL20 was done in four ponds with biosecurity implemented in the ponds and its surrounding area. Shrimp and water samples are regularly analyzed while water parameters are monitored regularly. Shrimp length and weight were recorded from samples at DOC 30, 45 and 60.</p>		

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Fish health component		
<p>Tilapia The study on TiLV will continue in 2020 with genomic sequencing and histopathological studies as well as tilapia sampling.</p>		
<p>Caligus sp. Experiments on the toxicity test of EMB, onion, and hydrogen peroxide against sea lice in pompano will continue. Furthermore, the life cycle of <i>Lepeophtheirus spinifer</i> (another genus of sea lice) will be conducted upon the availability of these parasites</p>		
<p>Whiteleg shrimp The study will continue in 2020 and the activities will be determined depending on the results of the present experiment</p>		
<p>Seaweeds Sentinel farm sampling and monitoring will be continued until June 2020. Field sampling in Palawan, Philippines will also be conducted as well as molecular identification and histological analysis of epiphytes.</p>		
<p>New studies The following studies will be proposed for 2020:</p> <p>(a) Quantitative and qualitative analyses of the bacterial microbiota of catfish (<i>Clarias macrocephalus</i>) cultured in earthen ponds as a tool for investigating emerging and re-emerging diseases of catfish in the Philippines – the study will address the concern on disease affecting catfish as identified by the Quality Seed program</p> <p>(b) Studies on the virulence factors of the Philippine strains of <i>Streptococcus</i> spp. and their potential application for vaccine development against streptococcal infection in tilapia and other susceptible fish species – this study will address the concern on Streptococcal infection affecting finfishes especially grouper which has been identified through commodity meeting on marine fish</p> <p>(c) Molecular studies on seaweeds</p> <p>(d) Antimicrobial resistance study on bacteria from shrimp and its environment – the study will be done as an update of a 1997 study by AQD</p>		
Nutrition and feed component		
<p>Tiger shrimp, milkfish, and tilapia Confirmatory runs be conducted during the first half of the year in order to have ample time to analyze results or to conduct another run when necessary.</p>	1 year	Side studies will be conducted to achieve firm results and conclusions
Consider proposing more studies on soybean meal as fish meal replacement	1 year	

4.2 Expected Outcomes/Outputs

The experiments conducted on different species are significant in the sustainability of aquaculture production in the region. However, an increased number of studies under the program objectives would contribute more to the overall thrust.

PROJECT DOCUMENT

Program Categories: Departmental Programs

Project Title: Maintaining Environmental Integrity through Responsible Aquaculture

Responsible Department: AQD

Total Duration: 2016-2020

Funding Sources: AQD, DA-BFAR, ACIAR

Estimated Budget for 2020: USD 142,617

1. INTRODUCTION

The phenomenal growth of aquaculture in recent decades has significantly improved the seafood supply to meet the demand of human's growing population. However, this development has caused various negative impacts to the natural environment, especially during the earlier stages of aquaculture expansion. Some of these impacts include the modifications of ecosystems, particularly of mangroves, and in some cases have caused destruction or complete loss of habitat; the unregulated collection of wild broodstock and seeds; translocation or introduction of exotic species; loss of biodiversity; introduction of antibiotics and chemicals; discharge of aquaculture wastewater causing coastal pollution; dependence on fishmeal and fish oil as aquaculture feed ingredient; spread of aquatic animal diseases, and others. In response to these issues, the Maintaining Environmental Integrity through Responsible Aquaculture Program or MEITRAP was developed by SEAFDEC to conduct scientific assessments on the adverse effects of aquaculture on the natural environment and to establish procedures on how these negative impacts can be mitigated in order to sustain healthy ecosystems in aquaculture areas. SEAFDEC/AQD has been developing aquaculture techniques and technologies for various species of finfish, crustaceans, mollusks, and new emerging aquaculture species, not only to enhance sustainable seafood production in the Philippines and other countries in Southeast Asian region, but also to safeguard the integrity of the coastal and aquatic environments.

2. PROJECT

2.1 Goal /Overall Objectives

The general objective of the program is to develop sustainable aquaculture technologies by integrating environmental factors in SEAFDEC/AQD research activities and to maintain environmental integrity by promoting responsible aquaculture practices.

The specific objectives are to:

- (1) assess impacts of aquaculture on biodiversity, water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems;
- (2) identify appropriate extractive species that may be used in Integrated Multi-Trophic Aquaculture (IMTA);
- (3) develop and promote efficient and suitable environment-friendly culture systems; and
- (4) conduct biological and ecological studies on species with potentials for resource enhancement.

2.2 Outcomes and Expected Outputs

Research and development activities of MEITRAP focus on maintaining environmental integrity while promoting sustainable and responsible aquaculture practices. In line with the program's objectives, the program involves studies on assessing impacts of aquaculture systems, evaluating prospects of potential tropical aquatic species for Integrated Multi-Trophic Aquaculture (IMTA), testing environment-friendly culture systems for various aquatic commodities, and promote resource enhancement especially of economically-important but vulnerable species.

2.3 Project Description/Framework

Activity 1: *Strategic feeding of milkfish Chanos chanos for efficient marine cage culture production*

The compensatory growth (CG) in fish, which enables rapid growth after a period of food restriction, provides an opportunity to reduce feed input with harvests anticipated to be comparable with the traditional full daily feeding.

The study, started in 2019, will determine the minimum duration of food restriction that primes CG response in milkfish fingerlings as well as the minimum duration of refeeding wherein normal physiology is regained and lost growth is fully compensated. CG response of the milkfish juvenile will be examined and a feeding technique will be established based on optimum starvation-refeeding cycle in a full grow-out culture of milkfish in marine cages.

Activity 2: Comparison of oyster Crassostrea iredalei growth and survival in brackishwater pond and river using pouch

This study was based on a recently concluded study funded by DOST-PCAARRD which identified the ‘pouch method’ as the best in producing single oysters with fast growth and homogenous sizes. The study aims to develop protocols for the “oyster-in-pouch” method to be potentially used in ponds that are otherwise unproductive for fish culture. As an initial activity, the study compares the growth and survival of oyster in brackishwater pond and river for grow-out culture, using pouches hung in floating rafts.

Activity 3: Grow-out culture of abalone in pipes

This study will verify the production effectiveness of a newly developed grow-out technique of rearing abalone using perforated PVC pipes, in collaboration with private partners around the island of Panay, central Philippines. This system only uses environment-friendly natural seaweed *Gracilariopsis heteroclada* as food for abalone. Started in March 2018, this study was successful in demonstrating the technology in an island community where some harvests were already made.

Activity 4: Polychaete culture in raceway ponds

Marine worms (Annelida: Polychaeta) are used as additive in maturation feeds to enhance reproductive performance of crustacean and fish broodstocks. Thus, culture production of polychaete needs to be enhanced. This study aims to verify culture methods of polychaetes in raceways and assess nutrient quality, health and profitability of such a culture system. The study has established protocols like stocking density, culture duration and optimal management in producing disease-free stocks.

Activity 5: Increasing technical skills supporting community-based sea cucumber production in Viet Nam and the Philippines

Funded by Australian Centre for International Agricultural Research (ACIAR) and in collaboration with other research and academic institutions in the Philippines, this study seeks to improve hatchery production strategy for sandfish using micro-algae concentrates, as well as to enhance productivity of ocean nursery and sea ranch systems through understanding of the optimal environmental conditions, seasonality, food requirements, as well as establishing measures to mitigate significant predation on stocks in the field. It will also develop strategies to improve livelihood outcomes of local communities through small-scale sandfish culture and related value chain.

Activity 6: Joint Mission for Accelerated Nationwide Technology Transfer Program for Aquaculture

SEAFDEC/AQD is committed to intensify techno-transfer of aquaculture technologies to stakeholders. The collaborative project between SEAFDEC/AQD and BFAR (Bureau of Fisheries and Aquatic Resources) entitled, Joint Mission for Accelerated Nationwide Technology Transfer Program (JMANTTP II) aims to promote sustainable aquaculture technologies that are economically-viable, environmental-friendly and socially-equitable to increase fish production, exports revenues, employment and livelihood options for the fisherfolks and to facilitate technology transfer by demonstrating sustainable technologies in strategic areas nationwide to serve as skill-learning centers for various stakeholders.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project/Activity Title	Duration	Remarks
<p>Milkfish Strategic feeding of milkfish (<i>Chanos chanos</i>) for efficient marine cage culture production</p> <p>In its first year in 2019, focus was on determining indicators of starvation in milkfish juveniles using body weight loss, length, and hepatosomatic index (HSI) by comparing starved and fed milkfish. Starved fish had significantly lower mean body weight after 2 days of starvation but not on days 3 to 5. Significantly lower mean body weight in starved group was observed again on day 6, 8, 9 and 10. It is likely that the significant difference on day 2 is only due to small sample size</p>	<p>Jan-Dec 2019</p>	

Project/Activity Title	Duration	Remarks
<p>number. Results suggest that milkfish fingerlings can withstand the lack of exogenous source of energy until about a week (~6 days). On the other hand, data on total length showed no significant differences between control and starved group throughout the trial.</p> <p>The hepatosomatic index (HSI) value of milkfish fingerlings in this study was highly responsive to variation in feeding. HSI value of starved fish was significantly lower compared to control group after two days of starvation and the succeeding time points throughout the trial. Within starved group, a significant reduction in HSI was observed after 1 day of starvation while minimum HSI value was observed on day 2. These observations suggest that there is depletion of energy reserve (<i>i.e.</i> liver glycogen) at day two and likely enough period to induce physiological changes specifically a shift to catabolic phase, a critical phase leading to CG response.</p> <p>To confirm results, refeeding experiments in milkfish fingerlings where in normal physiology is regained and lost growth is fully compensated will be conducted.</p>		
<p>Oyster Comparison of oyster <i>Crassostrea iredalei</i> growth and survival in brackishwater pond and river using pouch</p> <p>This study was conducted to verify the results of a previous research which indicated that hanging pouch method in grow-out culture of oysters produced larger and more uniform premium sizes. This study explores the opportunity to utilize existing ponds that may otherwise be unproductive for fish or crustacean cultivation.</p> <p>In its first year, the study focused on-site selection and has successfully identified an ideal area in Arellano River at Pawa, Panay in Capiz, Philippines.</p> <p>In June, construction of experimental rafts and oyster pouches was completed and a preliminary culture trial commenced using 3,000 pieces of locally-sourced oyster spats divided into a total of 12 rafts in the pond and adjacent river. After three months, growth and survival was higher in the river set-up compared to pond. It was concluded that mortalities in the pond were mainly caused by predation by crabs.</p>	<p>Jan-Dec 2019</p>	
<p>Abalone Grow-out culture of abalone in pipes</p> <p>As a first verification demo site, the study partnered with a private company at Sicogon Island, in northern Iloilo. The study uses an alternative culture method for abalone using perforated PVC pipes and natural food, seaweed <i>Gracilariopsis heteroclada</i>. In 2018, the study has conducted three stocking activities with a total of 3,125 abalone juveniles and has conducted two harvest activities with a total of 686 pieces. For this year, the system was able to stock a total of 5,249 abalone and has harvested 1,462 so far.</p>	<p>2018-2020</p>	
<p>Marine worm Polychaete culture in raceway ponds</p> <p>As a potential feed ingredient, polychaete needs to be disease-free which requires it to be produced in controlled environments like in land-based raceways using hapa nets.</p>		

Project/Activity Title	Duration	Remarks
<p>For this year, results of stocking density experiment showed that polychaetes maybe stocked as high as 2,000 ind/m² density with no significant differences in growth, biomass and survival performance with low density (e.g. 500 ind/m²). After four months of culture, polychaete biomass reached >100 g/m². Soil organic matter content was also reduced from >5% to 3.8% after four months, indicating the bioremediation potential of this species.</p>		
<p>Sea cucumber Increasing technical skills supporting community-based sea cucumber production in Viet Nam and the Philippines</p> <p>The study is funded by Australian Centre for International Agricultural Research (ACIAR) in a project entitled, “Increasing technical skills supporting community-based sea cucumber production in Viet Nam and the Philippines”. Its main objective is to streamline sea cucumbers <i>Holothuria scabra</i> culture by optimizing hatchery and nursery production up to resource enhancement and grow-out in sea ranch sites and community adoption.</p> <p>The project has duration of five years. The first year is focused on optimizing hatchery production by utilizing algal concentrates in order to minimize dependency on live micro-algae cultures. This can potentially reduce cost and hatchery production duration for sandfish juveniles. For the preliminary experiment, three microalgae concentrate (Instant Algae® from Reed Mariculture Inc., USA) were used: (1) mono-cultured <i>Thalassiosira weissflogii</i> (Bacillariophyceae) (TW 1200®); (2) mono-cultured <i>Isochrysis</i> sp. (Isochrysis 1800®) and a mixed product called Shellfish diet® 1800. Larval feeding experiment trial 1 was conducted from June to July 2019, to compare the three commercial micro-algae products with live <i>Chaetoceros calcitrans</i> (Cc) as feed for larval sandfish. Initial trials showed promising results using ISO1800 and Shellfish1800 but not for TW1200. The two former products also showed better results than live Cc especially in the first 6 days of larval development. Additional replicate runs will be conducted to confirm the initial results together with the evaluation of water quality parameters.</p> <p>Assessment of influence of biofilm on early juvenile sandfish production in ocean nursery system was done by re-establishing the sandfish ocean nursery. In 2019, two nursery rearing runs were conducted. The first run yield poor growth (0.02 g/d) and survival (<30%) rates due to predators and competitors. Secondary nursery rearing runs using six pens (100 m²each) yield excellent growth (1.15 g/d) with 40% recovery. However, after four months, evidence of predation was again observed which yielded negative growth (0.36-0.97 g/d) with 5.22% survival only. Predation mitigation measures will be explored</p>	2019-2023	
<p>Technology Transfer Program Joint Mission for Accelerated Nationwide Technology Transfer Program (JMANTTP II)</p> <p>This is a collaborative project between SEAFDEC/AQD and BFAR (Bureau of Fisheries and Aquatic Resources).</p> <p>In 2019, the main focus activity of this project is on the site assessment and feasibility of legislated multi-species hatcheries in different regions in the Philippines. As of 2018, fifteen of these sites are to be assessed. However, as of July 2019, only three sites have successfully passed the feasibility assessments and only one (at Linging, Surigao del Sur) has</p>		

Project/Activity Title	Duration	Remarks
<p>completed the requirements to begin construction of facilities. The general constraints in most sites includes problems with acquisition of land, difficult accessibility, lack of LGU coordination, environmental and water quality issues.</p> <p>Since 2018, the project also involved capacity development and aquaculture skills enhancement for LGU staff, community members and young graduates (e.g. BS Fisheries) on various hands-on practical and demonstration courses in aquaculture, particularly in hatchery operations and management.</p>		

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p>Milkfish The study on Strategic feeding of milkfish (<i>Chanos chanos</i>) for efficient marine cage culture production will continue its activities</p>	2020	
<p>Oyster The study on Comparison of oyster <i>Crassostrea iredalei</i> growth and survival in brackishwater pond and river using pouch will continue its activities</p>	2020	
<p>Abalone The study on Grow-out culture of abalone in pipes will continue its activities</p>	2020	
<p>Marine worm The study on Polychaete culture in raceway ponds will continue its activities</p>	2020	
<p>Sea Cucumber The collaborative project on sea cucumber will continue</p>		

4.2 Expected Outcomes/Outputs

Most of the study in 2019 will continue next year and will still focus on the development and promotion of efficient and suitable environment-friendly culture systems for various commodities such as milkfish, oyster, abalone, sea cucumber, and marine worm.

PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Meeting Social and Economic Challenges in Aquaculture
Responsible Department: Aquaculture Department
Total Duration: 2016-2020
Funding Sources: AQD and JIRCAS
Estimated Budget for 2020: USD 114,940

1. INTRODUCTION

Growth of aquaculture in the Southeast Asian region is driven by the scientific and technological breakthroughs developed and adopted by receptive entrepreneurs and investors. However, the development of aquaculture in the region has brought and caused a number of unintended problematic scenarios, such as: (1) inequitable distribution of opportunities and benefits across adopters of aquaculture; (2) technology and production cost dualism among aquaculturists; (3) social conflicts and economic losses due to competing uses of resources for aquaculture and other purposes; and (4) high cost of rehabilitation of habitats affected by misuse of natural resources for aquaculture.

2. PROJECT

2.1 Goal /Overall Objectives

This program generally aims to develop and implement social and economic strategies in aquaculture and resource management to secure food and income through stakeholder collaboration. The main objective is to respond to the specific recommendations for meeting the social and economic challenges in aquaculture identified and adopted during the *ASEAN-SEAFDEC Fish for All Conference* in June 2011. These include: (a) prioritizing collaborative R&D in aquaculture in the region to have a clear regional assessment and understanding of the role of aquaculture in poverty alleviation and provide basis for policy formulation; (b) allocating R&D resources to address emerging issues on the impacts of climate change and global trade on aquaculture with emphasis on small-holder fish farmers; and (c) enhancing multi-agency collaboration, sharing of information and resources between and among SEAFDEC and its Member Countries and other organizations in addressing the common problems of alleviating the socioeconomic conditions of the poor sector of region.

2.2 Outcomes and Expected Outputs

For 2019, the main outcomes of the program are the following:

- (1) Operationalization of the abalone and sandfish hatchery component of the Community-Based Resource Enhancement (CBRE) project in Brgy Molocaboc in Sagay Marine Reserve in Negros Occidental. However, the initial production runs need improvement.
- (2) Capacitated fisherfolks in hatchery operations through demo-training and actual operations being conducted by selected members of the Molocaboc Sea Ranchers Association (MOSRA).
- (3) Preliminary consultation for turn-over of the CBRE release site and hatchery for abalone and sandfish has been initiated with beneficiaries namely, the MOSRA and local government of Sagay City and Barangay Molocaboc.
- (4) Replication of the CBRE project in Lahuy Islands in Caramoan, Camarines Sur have been initiated through site assessment, baseline sampling of wild abalone and sandfish, consultation with fisherfolks, traders and local government stakeholders.
- (5) Required data for determining an economically efficient stocking density in mangrove crab hatchery operations have been identified and needs to be collected prior to application bioeconomic modeling methods.
- (6) Seven Integrated Multi-Trophic Aquaculture (IMTA) milkfish mariculture runs implemented through community-based approach have been completed since 2015. The data provided basis for socioeconomic and environmental evaluation of IMTA runs during summer and rainy seasons. Profitability is primarily constrained by high production cost due to high feeding rate and cost of feeds, and unrecovered proportion of stocks due to some factors such as mortality, probable poaching and escapees. Monitoring of environmental parameters such as organic matter and other pollutants does not indicate significant deterioration. Harvest of co-cultured sandfish and seaweeds needs improvement.

(7) Characterization and levels of improvement of sustainable livelihood assets were determined from the community-based IMTA milkfish mariculture in Guimaras province. The stakeholders assessed that human, financial, environmental and social livelihood assets improved significantly during the project duration from 2015 to 2018. Physical livelihood assets such as culture pens and fish culture equipment did not improve significantly because the limited mariculture pens of the project can only accommodate a few of the many fisherfolk stakeholders.

2.3 Project Description/Framework

Activity 1: *Community-Based Integrated Production of abalone *Haliotis asinina* and sea cucumber *Holothuria scabra* through culture, sea ranching and stock enhancement*

This is a five-year study that aims to conduct community-based integrated production abalone and sandfish through sea-ranching and stock enhancement using locally produced hatchery-bred seeds to provide sustainable sources of income for coastal dwellers in remote island communities while maintaining the health of the intertidal and reef environment. The study also aims to develop strategies towards governance of coastal resources in the Philippines and similar areas in Member Countries in Southeast Asia.

Activity 2: *Selecting optimal stocking density of mangrove crab *Scylla serrata* hatchery production in different seasons: A decision theory approach*

The study aims to select the optimal stocking density of mangrove crab (*Scylla serrata*) hatchery production across seasons. Specifically, it aims to identify the optimal mangrove crab stocking density in dry and wet seasons, taking into account water temperature uncertainty within them and the risk preferences of the producer or farm decision-maker. It will also determine the stocking density with the optimum economic yield to select in each season. All data will be evaluate using decision theory approach which integrate the bioeconomic model of the mangrove crab hatchery production.

Activity 3: *Community-Managed Small-holder IMTA Milkfish Mariculture and Value-adding in Guimaras, Philippines*

The project aims to develop technologies for sustainable aquatic production in harmony with tropical system. It will also test the economic and environmental efficiency of improved IMTA systems for milkfish cultured in marine pens, together with other high-value aquatic organisms such as sandfish, *Holothuria scabra*, and seaweeds, *Kappaphycus* sp.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project/Activity Title	Duration	Remarks
<p>Abalone and sea cucumber Community-Based Integrated Production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement</p> <p>Results from this study showed continuing progress of stock enhancement of abalone and sandfish. This year, the project had: 1) operationalized the on-site abalone and sandfish hatchery in Brgy. Molocaboc in Sagay Marine Reserve in Negros Occidental; 2) started the replication of the project in Lahuy Islands in Caramoan, Camarines Sur; and 3) successfully capacitated fisherfolks in hatchery operations. Preliminary turnover to beneficiaries were also initiated.</p> <p>Monthly monitoring of abalone in Dacu, the bigger islet in Molocaboc and one of the two release sites for this study, recorded catch per unit effort (CPUE, 1-hour fishing effort with 3 divers) at >200 individuals. Since March 2018, all samples caught were untagged abalones indicating spill-overs. Mean shell length (SL), body weight (BW) and body mass index (BMI) are declining over time due to increasing number of small-sized abalone spill-overs. Following the abalone catch size ordinance promulgated through this project, regulated harvesting of individuals >6 cm SL inside the release site continue during monthly sampling and occasionally as determined by the Molocaboc Sea Ranchers Association (MOSRA) and as needed to replenish</p>		

Project/Activity Title	Duration	Remarks
<p>organizational funds. Meanwhile, sandfish monitoring in Dacu and Diut, another islet and release site for the study, showed that average growth rates were higher in Diut than in Dacu. However, recapture rate is better in Dacu than in Diut where no sandfish were recovered in one of the pens for two consecutive sampling periods. This indicated low level of participation of MOSRA members and guarding of release site is problematic in Diut than in Dacu. Hence, series of meetings to sustain participation and demo-training on hatchery operations are being done to develop nurturing skills relevant to seed production for stock enhancement. In the long-run, it tames the hunting attitude that is detrimental to the sustainability of aquatic resources and environment.</p> <p>Freeze-drying (FD) trials for abalone was done to explore better marketing options. Preliminary results showed that freeze drying for 24 hours reduced moisture content (MC) 2.06% while 8 hours reduced MC to 26.85%. For both cases, salmonella and coliform were observed in the samples at levels that can be eliminated by cooking. Water activity test showed same yeast and molds for those freeze-dried at 24, 12 and 8. Only 58 and 66% of the original weight of the abalone flesh was recovered after rehydration for 52 and 96 hours, respectively.</p> <p>The operations of the newly-constructed, solar-powered abalone hatchery began with four spawning from 19-23 July 2019 with variable results. Fertilized egg production ranged from 50,000 to 850,000 harvested and 20% of which formed into larvae. Another spawning and hatching runs took place in the week of 20 September. Preliminary sampling showed some larval settlement. However, larval settlement rate needs improvement and more diatoms are needed.</p> <p>In preparation of the end of project in December 2019, meetings between stakeholders in the tri-party collaboration were held to discuss the turn-over of the project and facilities to the MOSRA and the local government of Sagay City and Brgy. Molocaboc who have official jurisdiction over the location of the project.</p> <p>The activities to replicate the CBRE in two sites such as in Molocaboc Diut in Sagay Marine Reserve and in the Lahuy Island Group in Caramoan, Camarines Sur province continues. The monitoring of the released sandfish continues to show the potential of rebuilding stocks in Diut. However, there were incidents of unrecovered sandfish in pens due perhaps to poaching. Hence, meetings were held with fisherfolks to address such problems. The replication in Caramoan was determined to focus on resource management instead of enhancement of juveniles because abalone stocks were still available in the area</p>		
<p>Mangrove crab Selecting optimal stocking density of mangrove crab <i>Scylla serrata</i> hatchery production in different seasons: A decision theory approach</p> <p>Relevant literature on mangrove crab life cycle, production, and bio-economic analysis were reviewed for this study. Findings from this study have significant implications to the multi-million mangrove crab aquaculture industry.</p> <p>The existing mangrove crab hatchery protocols were reviewed and water samples were collected daily with AQD hatchery staff since 1 April 2019. Preliminary results of the crab instar harvest on 16 April 2019 showed the completed larval cycle (from early to crab instar) with stocking density of 60 zoea/L, the observed average ammonia level at</p>		

Project/Activity Title	Duration	Remarks
<p>(0.88 ppm) is less than the normal range of ≤ 1 ppm. Nitrite level at 0.29 ppm was higher than normal at ≤ 0.1 ppm. Despite its quite high reading, crab larvae were able to tolerate. Temperature (29.9°C) and dissolved oxygen (4.91) however, was within the optimum level (27-30°C and >4 ppm, respectively). Crab larvae survival is 1% which is reasonably satisfactory compared to the 80 zoeas per liter survival of 0.37%. These initial results indicate that mangrove larvae perhaps have high tolerance of nitrogen loading in the environment that may be associated with increasing anthropogenic activities and climate changes. These environmental conditions may have significant implications to the multi-million mangrove crab aquaculture industry. The study, therefore, requires further data collection and analyses for conclusive results. The next batch of stocking is pending and waiting for breeders to spawn since the last hatched eggs were discarded due to poor quality.</p>		
<p>Milkfish Community-Managed Small-holder IMTA Milkfish Mariculture and Value-adding in Guimaras, Philippines</p> <p>This study continues to implement the IMTA of milkfish, <i>Chanos chanos</i>, together with sandfish, <i>Holothuria scabra</i>, and seaweeds, <i>Kappaphycus</i> sp. in collaboration with local fisherfolks, women and local government in Barangay Pandaraonan in the municipality of Nueva Valencia in Guimaras province.</p> <p>Results for the seventh IMTA milkfish run (April to August 2019) showed 92.8% harvest, 0.8 mortality and 6.4% uncounted. Meanwhile, interviews with 52 stakeholders were conducted from December 2018 to February 2019 for an inter-temporal analysis of sustainable livelihood assets (SLA) relevant to the implementation of community-managed IMTA in rural coastal communities. The analysis showed improvement of four out of five categories of livelihood assets such as human, environmental, financial and social assets associated with this IMTA project. Physical livelihood assets (such as pens, cages, fish value-adding equipment) did not significantly increase as perceived fisherfolk stakeholders. These physical assets are dissipated and are thus limited for the many project beneficiaries. Therefore, there is the need to organize more and bigger collaborative projects with emphasis on sustainable livelihood asset development to create significant impacts in coastal communities.</p> <p>Seven IMTA milkfish mariculture runs implemented through community-based approach have been completed since 2015. The data from these runs became the basis for socioeconomic and environmental (summer and rainy seasons) evaluation of IMTA runs. Findings show that profitability was primarily constrained by high production cost due to high feeding rate and cost of feeds. The unrecovered proportion of stocks due to some factors such as mortality, probable poaching and escapees also caused the constraints. Monitoring of environmental parameters such as organic matter and other pollutants does not indicate significant deterioration. Harvest of co-cultured sandfish and seaweeds needs improvement.</p> <p>Characterization and levels of improvement of sustainable livelihood assets were determined from the community-based IMTA milkfish mariculture in Guimaras province. The stakeholders assessed that human, financial, environmental and social livelihood assets improved significantly during the project duration from 2015 to 2018.</p>		

Project/Activity Title	Duration	Remarks
Physical livelihood assets such as culture pens and fish culture equipment did not improve significantly because the limited mariculture pens of the project can only accommodate a few fisherfolk stakeholders.		

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p>Continuation of study “Selecting optimal stocking density of mangrove crab <i>Scylla serrata</i> hatchery production in different seasons: A decision theory approach”</p> <p>The study will continue to be implemented when required data set (<i>i.e.</i> salinity, temperature, dissolved oxygen, ammonia and nitrite level, etc.) is completed. For the remaining months until December 2019, it was suggested that: (1) a template of data needs be provided to the AQD hatchery facility operators to guide data collection; (2) hypothetical data be combined with available data to be used in the bioeconomic model in order to come up with sample results that will demonstrate the utility of the model; and (3) recommend that budget be provided to hatchery facilities to fund required laboratory analysis.</p> <p>This sample bioeconomic model aims to motivate other researchers in AQD hatchery facilities to collect the needed data for modeling the optimal stocking density across seasons.</p>		
<p>A study on “Developing Institutions and Governance Policies for the Adoption of Stock Enhancement” is being proposed.</p> <p>The study aims to review and evaluate existing fisheries and aquaculture policies relevant to fisheries management; formulate policies to mobilize government support for community-based stock enhancement using hatchery-reared seeds; and recommend coastal tenurial arrangements to benefit fishing communities in the Philippines and the SEA Region with similar circumstances.</p> <p>Activities for 2020-2021: Review existing policies and sectoral statistics that are relevant to the role of aquaculture (especially hatcheries and nurseries) in fisheries management; Conduct dialogues with stakeholders to gather data for the formulation of policies for implementation of stock enhancement; and Publish policy notes for promoting support to aquaculture and stock enhancement.</p>	2020-2021	
Another study on sandfish will be proposed with funding from ACIAR	2020	

4.2 Expected Outcomes/Outputs

For 2020, the program will aim to address one of its main objectives and that is to enable mechanisms and institutions to encourage the adoption of better aquaculture practices. Especially with the newly proposed study on “*Developing Institutions and Governance Policies for the Adoption of Stock Enhancement*”, with emphasis on the important role of aquaculture seed production technologies to support rehabilitation of fisheries through stock enhancement.

PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Adapting to Climate Change
Responsible Department: Aquaculture Department
Total Duration: 2016-2020
Funding Sources: AQD
Estimated Budget for 2020: USD 26,988

1. INTRODUCTION

Climate change is already happening. There is little doubt that global warming is occurring and at a greater rate than previously predicted. The recent extreme weather disturbances like more frequent and stronger typhoons, long dry spells resulting to droughts, frequent heavy rains resulting to severe flooding are some of the phenomena that are linked to climate change. These changes are projected to impact broadly across ecosystems and economies, increasing pressures on all livelihoods and food supply chains, including those in the fisheries and aquaculture sector. The future food supply will be a central issue as food resources come under greater pressure, and the availability and access to fish supplies will become an increasingly critical development issue.

Climate change is a compounding threat to the sustainability of aquaculture development. Impacts occur as a result of gradual warming, the increasingly acidity of the oceans and associated physical and chemical changes as well as from frequency, intensity and location of extreme climatic events. How these changes affect the aquaculture organisms in general, the different aquaculture systems and structures, the various support systems to aquaculture operations, and to the fish farmers in the region are highly vulnerable since they are dependent on their aquaculture operations for food and income. Urgent adaptation measures are required in response to the threats to food and livelihood provision due to climatic variations.

2. PROJECT

2.1 Goal /Overall Objectives

The overall goal of the program is to help ensure sustainability of aquaculture amidst the expected impacts of disturbances in the culture environment brought about by climate change/global warming.

2.2 Outcomes and Expected Outputs

- (1) Scientific information on the effects of increasing temperature and acidity, as well as other perturbations in the culture environment brought about by climate change (CC) on the different cultured species (reproduction, early development, recruitment and performance during culture including susceptibility to diseases), the different natural food organisms used for broodstock and seed production, natural pond productivity, the occurrence of diseases, and on the mangrove ecosystem
- (2) Information on feed ingredients that can potentially replace fish meal and fish oils in feeds for cultured species
- (3) Identification of CC-resilient species
- (4) Development and promotion of CC-resilient practices
- (5) Establishment of early warning systems that will enhance the resilience of the aquaculture sector

2.3 Project Description/Framework

At present, there is no activity that is directly listed under the Climate Change Program. However, several activities under the other Departmental programs also address the objectives of this program. Moreover, information on the impacts of climate change on aquaculture is incorporated in all SEAFDEC/AQD training courses.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Although there is no activity that is directly listed under the Climate Change Program at present, several activities under the other Departmental programs also address the objectives of the Climate Change Program.

Project/Activity Title	Duration	Remarks
The studies on the effects of temperature and salinity on the reproduction of copepods that are potential food during seed production, effects of salinity and pH on growth of seaweeds and growth of green algae used in rotifer culture, comparing the effects of water temperature on the mating performance of captive and wild stocks of shrimp broodstock, and the effect of abrupt salinity fluctuations on the early recruitment of sandfish also address CC issues.		
The past and current activities on the evaluation of potential feed ingredients from various sources (e.g. industrial, agricultural and fish processing by-products) as replacement for fish meal and fish oil help address constraints of diminishing supplies of fish meal and fish oil in light of the expected impacts of climate change on global fisheries resources. For example, based on previous work on alternative ingredients, a low-fish meal feed (1-2% fish meal) for tilapia and milkfish is now being field tested. Information on nutrient profiles of these ingredients can be added into the Regional Feed Ingredients Database. These initiatives contribute to overall resilience of the aquaculture sector in the region.		
Ongoing studies on persistent and emerging diseases (white spot syndrome, acute hepatopancreatic necrosis diseases, enterocytozoonhepatopenaei, nervous necrosis virus, tilapia lake virus, as well as other viral, bacterial, and parasitic diseases), as well as development of measures to prevent and control disease outbreaks (e.g. vaccination, immunostimulation, greenwater culture) likewise address climate change issues. The formulation of policy recommendations as well as development of guidelines for the establishment of an early warning and response system for disease outbreaks based on the outcomes of the Regional Technical Consultation on the said issue help improve capacity in dealing with disease outbreaks in the region. This system, can be linked to other initiatives like the warning system for harmful algal blooms or fish kills to contribute further to building resilience to the impacts of climate change.		
The current initiatives promoting community-based resource enhancement and aquaculture-based community livelihood programs also improve the resilience of coastal communities, one off the most affected sector of society, to the impacts of climate change.		

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Continue to incorporate climate change-resilient practices in studies conducted in AQD as well as in training and information materials		

4.2 Expected Outcomes/Outputs

The program is expected to generate and integrate scientific information which relates to the regulation and preparation of the industry, fish farmers, and other stakeholders to the effects and impacts of climate change.

PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Collaborative Projects with the Philippine Government
Responsible Department: Aquaculture Departments
Total Duration: 2018-2021
Funding Sources: BFAR and NFRDI
Estimated Budget for 2020:

1. INTRODUCTION

Over the years, the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC/AQD) has developed technologies in broodstock development, seed production and grow-out as well as feeds and nutrition of economically-important finfishes, crustaceans, mollusks and seaweeds in various stages of development. Several of these technologies already been successful field-tested in ponds, pens, and cages in fresh, brackish, and marine waters in collaboration with fish pond operators, local government units, non-government organizations and other international organizations. With this, two projects were conducted by SEAFDEC/AQD to support the thrusts of its host government.

First is the collaborative project between SEAFDEC/AQD and Bureau of Fisheries and Aquatic Resources (BFAR) will be the Joint Mission for Accelerated Nationwide Technology Transfer Program (JMANTTP II).

In order to accelerate fish production and export revenues from the aquaculture sector, SEAFDEC/AQD is committed to intensifying techno-transfer of matured aquaculture technologies to stakeholders which will provide additional and alternative livelihood to fisherfolks through sustainable aquaculture technologies that are economically viable, environment-friendly and socially equitable.

Traditionally, fish meal has provided a major part of protein sources in formulated feeds because of its suitable protein quality. Since the recent scarcity and uncertain consistency of supply encourage its replacement by alternative protein sources that are of high quality, but less expensive has been investigated in many fish species. The limitations on the world's food supply provide additional motivation. Therefore, numerous studies have undertaken to examine the effects of replacing fish meal by another source of protein such as animal by-product or plant-based protein in diets.

Poultry by-product meal is one of the most important sources of animal protein used to feed domestic animals, along with meat and bone meal, blood meal, feather meal and fish meal. It is made by combining the by-products coming from poultry slaughterhouses or poultry processing plants. The AAFCO (USA) defines poultry by-product meal as the ground, rendered, clean parts of the carcass of slaughtered poultry such as necks, heads, feet, undeveloped eggs, gizzards and intestines (provided their content is removed), exclusive of feathers (except in such amounts as might occur unavoidably in good processing practices). It is generally a palatable and high-quality feed ingredient due to its content in essential amino acids, fatty acids, vitamins and minerals. In addition to its use in livestock, it is in high demand from the pet food and aquaculture industries (Meeker et al., 2006).

Distiller's dried grains with solubles (DDGS) is also an alternative protein source but on the other hand, plant-based. It is a nutrient rich co-product of dry-milled ethanol production. There is an increasing interest in using DDGS in aquaculture diets around the world due to its moderately high protein content, relatively low phosphorus content, and low cost compared to fish meal. DDGS utilization as a feed ingredient is well documented as both an energy and a protein supplement. Furthermore, it does not contain anti-nutritional factors found in other protein sources such as soybean meal (trypsin inhibitors) or cottonseed meal (gossypol). Limited studies have been conducted to evaluate the addition of DDGS to catfish, rainbow trout, tilapia, sunshine bass, Pacific white shrimp, and freshwater prawns. Adding 10 percent DDGS to all aquaculture feeds can result in excellent performance, and DDGS levels up to 20 to 30 percent can also result in excellent performance if adequate additions of some crystalline amino acids (lysine, methionine, tryptophan) are added, or other complementary protein sources containing higher levels of amino acids are included in fish feeds.

Fermented copra meal has been previously utilized as black tiger shrimp (*Penaeus monodon*) aquafeed to replace dietary protein from fish meal for up to 40% without adversely affecting growth, feed efficiency, and survival. Furthermore, the same ingredient can be used to replace soybean meal in milkfish diet for up to 20%

without affecting performance parameters and when used in longer duration in commercial cage culture systems. With the increasing by-products derived from coconut oil production, copra meal has a huge potential to be an alternative, cheap, and sustainable source of protein for fish feed industry.

With this, SEAFDEC/AQD and the National Fisheries Research and Development Institute (NFRDI) will identify and utilize cost-effective feed ingredients which can be used as an alternative to fish meal.

2. PROJECT

2.1 Goal /Overall Objectives

The JMANTTP-II program aims to:

- (1) Promote sustainable aquaculture technologies that are economically-viable, environment-friendly and socially-equitable to increase fish production, exports revenues, employment and livelihood options for the fisherfolks;
- (2) Facilitate technology transfer by demonstrating sustainable technologies in strategic areas nationwide to serve as skill-learning centers for fish farmers, entrepreneurs, and other end-users through techno-caravan, field demonstrations and hands-on training;
- (3) Jointly implement the Oplan Balik Sugpo consistent with the AFMA and RA 8550.
- (4) The low-cost feed project will develop sustainable and low-cost feeds that can improve fish growth, survival, production and increase the income of fish farmers. It will specifically aim to:
- (5) Identify potential raw materials and alternatives to fishmeal and other high cost feed ingredients for feed formulation,
- (6) Formulate and develop sustainable and low-cost feeds for tilapia and milkfish; and
- (7) Pilot test the formulated feeds to NFRDI national centers, BFAR regional stations and private cooperators for feed trials in pond and cage culture of milkfish and tilapia

2.2 Outcomes and Expected Outputs

- (1) Be able to introduce SEAFDEC/AQD established aquaculture technologies such as:
 - a. Environment-friendly farming of shrimp in ponds;
 - b. Cage and Pond culture of economically important marine and freshwater species (pompano, grouper, seabass, snapper, milkfish and tilapia);
 - c. Hatchery production of economically important marine and freshwater species (pompano, grouper, seabass, snapper, milkfish and tilapia); and
 - d. Use of feeds containing alternative ingredients to ensure sustainable and low production cost aquaculture.
- (2) Create a manpower development pool to be trained at different aquaculture disciplines which will be deployed at several government and private aquaculture facilities. Short term training courses will be tailored made for fish farmers, entrepreneurs as well as students interested in aquaculture science.

2.3 Project Description/Framework

Activity 1: *Joint Mission for Accelerated Nationwide Technology Transfer Program for Aquaculture (JMANTTP II)*

The following are the general framework undergone in 2018 and 2019:

- (1) Develop a pool of technical experts to operate various aquaculture systems nationwide
- (2) Conduct feasibility study of the legislated hatcheries and site evaluation of existing and proposed aquaculture facilities (fish pond, hatchery and fish cage sites)
- (3) Create plans and design of aquaculture facilities specific in the area which will include cost of materials and construction. Renovation of existing facilities will also be included in the planning.
- (4) Operate aquaculture facilities utilizing SEAFDEC/AQD developed protocol and to be managed by SEAFDEC/AQD trained personnel.
- (5) Conduct training (techno-caravan) nationwide in areas based on the request of BFAR and LGU where aquaculture industry has a potential.
- (6) Monitor the operation of aquaculture systems to be opened nationwide.

Activity 2: Establishment of a feed mill for a low-cost broodstock diet

The following is the framework of the project:

- (1) Development of feed formulation for milkfish and tilapia
- (2) Identification of pilot sites (cage and pond culture)
- (3) Testing of SEAFDEC/AQD formulated feeds versus commercial feed
- (4) Conduct growth, survival, water parameters, proximate, and cost-and-return analysis
- (5) Transfer of technology to the fish farmers

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project/Activity Title	Duration	Remarks														
<p>JMANTTP-II</p> <p><i>Oplan Balik Sugpo</i></p> <p>SEAFDEC/AQD’s “<i>Oplan Balik Sugpo</i>” program aims to revive the shrimp production as well as to provide farmers with good quality shrimps for grow-out culture in the Philippines after the drastic decline of this commodity since the late 1990s.</p> <p>The technology demonstration projects will be divided into two phases. The first phase will be started in SEAFDEC/AQD Dumangas Brackishwater Station with the technology demonstration run on low/partial discharge and closed-recirculating system of shrimp farming using environment-friendly schemes at the intensive, semi-intensive and modified extensive levels of production (Baliao, 2000; Baliao and Tookwinas, 2002).</p> <p>Successful technology demonstration runs will then be followed by the implementation of Phase 2. In this phase, demonstration projects will be conducted in private commercial shrimp farms whose owners requested technical assistance on shrimp farming from SEAFDEC/AQD through the program.</p> <p>To support this program, the shrimp hatchery complex was equipped with its own spawner/broodstock facility for pathogen detection of newly-arrived spawners. The shrimp hatchery often utilizes spawners from the wild wherein they are being processed and analyzed before and after spawning to determine if there is a presence of pathogens. After spawning, when tests resulted positive, nauplii are chlorinated and discarded. Nauplii that are positive of the disease are stocked on the modules containing tanks for larval rearing until they reached the postlarvae stage where they are being harvested. The hatchery is equipped with its several larval rearing tanks divided into two modules to allow resting of the other module after stocking. It has also several filtration systems to ensure good water quality for the stocks. Seawater from the source will first pass through the sand filter before it will reach the reservoir. From the reservoir, it will pass through the rapid sand filter, then through the UV sterilizer before it will reach the larval rearing tank with the filter bag. Fry harvesting is done when they already reached the PL 20 stage</p> <table border="1" data-bbox="236 1691 1019 2031"> <thead> <tr> <th colspan="2" data-bbox="236 1691 1019 1727">Potential implementation sites for Phase 2</th> </tr> <tr> <th data-bbox="236 1727 766 1753">Institution</th> <th data-bbox="766 1727 1019 1753">Province</th> </tr> </thead> <tbody> <tr> <td data-bbox="236 1753 766 1816">SEAFDEC/AQD’s Dumangas Brackishwater Station</td> <td data-bbox="766 1753 1019 1816">Iloilo</td> </tr> <tr> <td data-bbox="236 1816 766 1850">BFAR Training Center in Lala</td> <td data-bbox="766 1816 1019 1850">Lanao del Sur</td> </tr> <tr> <td data-bbox="236 1850 766 1912">BFAR Integrated Fisheries Demonstration Center (IFDC)</td> <td data-bbox="766 1850 1019 1912">Surigao del Norte</td> </tr> <tr> <td data-bbox="236 1912 766 1975">BFAR Demonstration and Training Center, Calape</td> <td data-bbox="766 1912 1019 1975">Bohol</td> </tr> <tr> <td data-bbox="236 1975 766 2031">BFAR Botong Fishery Biological Center in Taal</td> <td data-bbox="766 1975 1019 2031">Batangas</td> </tr> </tbody> </table>	Potential implementation sites for Phase 2		Institution	Province	SEAFDEC/AQD’s Dumangas Brackishwater Station	Iloilo	BFAR Training Center in Lala	Lanao del Sur	BFAR Integrated Fisheries Demonstration Center (IFDC)	Surigao del Norte	BFAR Demonstration and Training Center, Calape	Bohol	BFAR Botong Fishery Biological Center in Taal	Batangas		
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Project/Activity Title	Duration	Remarks				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">BFAR Training Center in Pagbilao</td> <td style="width: 50%;">Quezon</td> </tr> <tr> <td>Negros Prawn Producers' Marketing Cooperative, Inc. (NPPMCI)</td> <td>Negros Occidental</td> </tr> </table>	BFAR Training Center in Pagbilao	Quezon	Negros Prawn Producers' Marketing Cooperative, Inc. (NPPMCI)	Negros Occidental		
BFAR Training Center in Pagbilao	Quezon					
Negros Prawn Producers' Marketing Cooperative, Inc. (NPPMCI)	Negros Occidental					
<p>The shrimp hatchery produced disease-free fry that was stocked on the brackishwater ponds of the Dumangas Brackishwater Station last July 2019.</p>						
<p><i>In situ Training Courses</i></p> <p>As part of introducing sustainable aquaculture technologies that are economically viable, environment-friendly, and socially equitable that were developed in SEAFDEC/AQD, nationwide techno-caravan, field demonstrations, and hands-on trainings shall be conducted at the help of BFAR. SEAFDEC/AQD and BFAR will conduct field evaluations of BFAR's national aquaculture centers and regional stations and identify appropriate technologies to be demonstrated thereat. This technology transfer will allow fish farmers, entrepreneurs, and other end-users to the possibility of having an additional and alternative livelihood.</p> <p>Several training courses have already been conducted on different regions to promote sustainable aquaculture technologies. Fish farmers, fishpond owners and operators have been recipients of these on-site training courses which include the following:</p> <p>On-site training course on Freshwater Aquaculture in University of Southern Mindanao, Kabacan, Cotabato, Philippines Sixty-eight (68) fishpond owners, farmers and operators from Region XII participated in the training course conducted by the collaboration of SEAFDEC/AQD and BFAR XII. The training course focused mostly on freshwater commodities like Tilapia, Milkfish, Giant Freshwater Prawn and Catfish. This 4-day training was equipped with a lecture series on the first three days and practical sessions on the fourth day. Practical sessions included packing and transport of tilapia fry, proper acclimation and stocking of fry in ponds, water quality parameters monitoring and feed preparation for sex reversal of tilapia. Participants were also given free manuals and brochures to be used for their operation.</p> <p>On-site training course on Tacloban City, Leyte, Philippines Another on-site training course was held last 20-22 May 2019 at Hotel Alejandro, Tacloban City, Leyte. The training focused on marine aquaculture of high-valued species of fish like groupers, seabass, pompano, etc. Sixty-four participants composed of training officers and fish growers from Region VIII availed of the free training.</p>						
<p>Manpower Development</p> <p>In order to increase the number of fish farmers in the Philippines, SEAFDEC/AQD will train a batch of fisheries graduates in hatchery seed production as well as pond culture using different culture systems. Successful graduates of this rigorous and in-depth training will be deployed to SEAFDEC/AQD projects or will be recommended to various related government offices, non-government, or private business sector. The training is composed of shrimp, marine fish, and tilapia aquaculture technologies.</p> <p>Sixteen (16) graduates from different fisheries schools in Western Visayas were trained during the Training Course on Manpower Development for Shrimp, Marine Fish, and Tilapia Aquaculture to enhance their capabilities and broaden their perspectives and experiences in terms of aquaculture. They were trained on shrimp and multi-species marine fish hatchery operations, and cage and brackishwater pond culture operations. After three months of intensive training, they were assigned to different areas and hatcheries at</p>						

Project/Activity Title	Duration	Remarks
<p>Tigbauan Main Station. They were assigned to the Marine Fish Hatchery, Shrimp Hatchery, Crab Hatchery, Integrated Hatchery, Fish Health Section, and Natural Food Laboratory in a rotational manner to be engaged on the different operations.</p>		
<p>Profiling of Operating/Abandoned/Non-operating Hatcheries in the Province of Iloilo, Philippines</p> <p>To increase fry production within the Iloilo, SEAFDEC/AQD will offer technical assistance to BFAR Region VI regarding the rehabilitation of non-operational, abandoned, or damaged hatcheries. Site visits on the chosen hatcheries will be conducted in order to assess whether the facilities are still capable of operating. Recommendations, cost estimates, and other technical plans shall be sent to BFAR for consideration.</p> <p>Staff from SEAFDEC/AQD conducted the profiling of abandoned, operating or non-operating hatcheries in the first district of Iloilo. Nine hatcheries in the first district of Iloilo are operating and are culturing tilapia, <i>Litopenaeus vannamei</i>, <i>Penaeus monodon</i>, milkfish and seabass. On the other hand, twelve hatcheries were listed as abandoned or non-operating due to sickness or death of owner, bankruptcy or lack of finances to continue operation. Most abandoned hatcheries cultured <i>Penaeus monodon</i> when there was a high demand of this commodity. The profiling of hatcheries is done to serve as baseline information with regards to the rehabilitation of non-operational hatcheries in the area in order to maximize the production of milkfish fry in the industry.</p>		
<p>Feasibility Study of Legislated Multi-Species Hatchery</p> <p>In accordance with the Memorandum of Agreement between BFAR and SEAFDEC/AQD, areas of selected legislated multi-species hatcheries from the 16th and 17th Congress shall be evaluated. This activity is in line with the “Bangus (milkfish) Fry Sufficiency” program of BFAR which aims to give emphasis on the current and future milkfish fry requirement of the Philippines. Once constructed, the legislated multi-species hatchery will serve as one of the central milkfish hatcheries providing the seed requirement of grow-out facilities, like ponds, pens or cages within its region. Each marine hatchery is capable of producing 25 million milkfish fry annually, however, even though the facility is designed for milkfish, it is still capable of accommodating other marine species (<i>i.e.</i> shrimp, pompano, mangrove crab). Aside from fry production, the hatchery facility will also serve as a training facility for interested private groups that plan to put up hatcheries of their own or for University/College students undertaking on-the-job training. Hands-on training can be provided by the resident technicians on the various aspects of the hatchery operation. The hatchery facility can also serve as a demonstration facility to show timely innovations that might be developed through years of operation.</p> <p>In accordance with the Memorandum of Agreement between DA-BFAR and SEAFDEC/AQD, continued sites assessments has been conducted on the legislated areas. New proposed sites in Hinatuan and Surigao City in CARAGA have been evaluated, as well as additional areas in Quezon province.</p> <p>Another three sets of detailed engineering layout plan and detailed feasibility studies have been turned over to the BFAR Central Office and the respective BFAR Regional Offices and LGU. The new legislated areas that have received their detailed feasibility study are: Perez, Quezon (RA 10945); Sultan Naga Dimaporo, Lanao del Norte (RA 10860); and Jose Dalman, Zamboanga del Norte (RA 10859). Six (6) out of the 15 legislated areas listed in the MOA have already received their engineering plans and</p>		

Project/Activity Title	Duration	Remarks																								
<p>feasibility study.</p> <p>The construction of the multi-species marine hatchery in Lingig, Surigao del Sur, under RA 10787, has started. It is expected to finish around the second quarter of 2020. Meanwhile, the hatchery in Del Carmen, Surigao del Norte, under RA 10825, is also set to begin its construction around the last quarter of the year. The only freshwater multi-species hatchery in Jabonga, Agusan del Sur, under RA 10813, is also ready to start once the bidding process is finished.</p>																										
Low-cost feeds																										
Milkfish in floating net cages																										
<p>The initial growth trials for milkfish was conducted at SEAFDEC/AQD's Igang Marine Station (IMS) in floating net cages on 15 May 2019 (6 June 2019 is the actual start of the growth experiment). Milkfish juveniles with an average body weight of 33 g were stocked in six (6) 5 x 5 x 3 m floating net cages at a stocking density of 33.4 fish per m³ (2,500 fish per cage). Two dietary treatments (SEAFDEC/AQD formulation and commercial grower feeds) were used wherein each treatment has three replicates. The experiment will be terminated once the fish obtains a marketable body weight of 350-400 g. Sampling of stocks will be conducted every 30 days. The preliminary results of the experiment are the following:</p>																										
<table border="1"> <thead> <tr> <th data-bbox="188 931 320 1055"></th> <th data-bbox="325 931 592 1055">AQD Diet <i>(average body weight for three cages in grams)</i></th> <th data-bbox="596 931 863 1055">Commercial Diet <i>(average body weight for three cages in grams)</i></th> <th data-bbox="868 931 979 1055">Date (2019)</th> </tr> </thead> <tbody> <tr> <td data-bbox="188 1061 320 1084">1</td> <td data-bbox="325 1061 592 1084">35.11</td> <td data-bbox="596 1061 863 1084">31.33</td> <td data-bbox="868 1061 979 1084">6-Jun</td> </tr> <tr> <td data-bbox="188 1090 320 1113">2</td> <td data-bbox="325 1090 592 1113">236.70</td> <td data-bbox="596 1090 863 1113">212.19</td> <td data-bbox="868 1090 979 1113">15-Aug</td> </tr> <tr> <td data-bbox="188 1120 320 1142">3</td> <td data-bbox="325 1120 592 1142">393.45</td> <td data-bbox="596 1120 863 1142">325.35</td> <td data-bbox="868 1120 979 1142">3-Oct</td> </tr> <tr> <td data-bbox="188 1149 320 1211">Ave WG (%)</td> <td data-bbox="325 1149 592 1211">1,021.66</td> <td data-bbox="596 1149 863 1211">950.875</td> <td data-bbox="868 1149 979 1211"></td> </tr> </tbody> </table>				AQD Diet <i>(average body weight for three cages in grams)</i>	Commercial Diet <i>(average body weight for three cages in grams)</i>	Date (2019)	1	35.11	31.33	6-Jun	2	236.70	212.19	15-Aug	3	393.45	325.35	3-Oct	Ave WG (%)	1,021.66	950.875					
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3	393.45	325.35	3-Oct																							
Ave WG (%)	1,021.66	950.875																								
Tilapia in ponds																										
<p>In partnership with NFRDI Muñoz, the feeding experiment for tilapia was initiated at Munoz, Nueva Ecija on 27 June 2019. Tilapia fingerlings with an average body weight of 21 g were stocked in 6,300 m² ponds at a stocking density of 5 fish per m² (1,500 fish per pond). Two dietary treatments (SEAFDEC/AQD formulation and commercial grower feeds) were used wherein each treatment has three replicates. The experiment will be terminated once the fish obtains a marketable body weight of 300-350 g. Sampling of stocks will be conducted every 30 days. The preliminary results of the experiment are the following:</p>																										
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Ave WG (%)	1,150.80	1,016.56																								
<p>The second feeding experiment for tilapia was conducted at Lala, Lanao del Norte on September 17, 2019. Tilapia fingerlings with an average body weight of 11 g were stocked in 6,200 m² ponds at a stocking density of 5 fish per m² (1000 fish per pond). Two dietary treatments (SEAFDEC/AQD formulation and a commercial grower feeds) were used wherein each treatment has three replicates. The experiment will be terminated once the</p>																										

Project/Activity Title	Duration	Remarks
fish obtains a marketable body weight of 300-350 g. Sampling of stocks will be conducted every 30 days.		

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
JMANTTP-II		
<p><i>Oplan Balik Sugpo</i></p> <p>Continued production of disease-free fry by following strict biosecurity protocols and the possible acquisition of SPF spawners.</p> <p>Program objectives that will be achieved:</p> <ol style="list-style-type: none"> (1) The promotion of sustainable aquaculture technologies that are economically-viable, environment-friendly and socially-equitable to increase fish production, exports revenues, employment and livelihood options for the fisherfolks; (2) By jointly implementing the Oplan Balik Sugpo consistent with the AFMA and RA 8550; and (3) Introduction of environment-friendly farming of shrimp in ponds that was developed by SEAFDEC/AQD. 	2020	
<p><i>In situ Training Courses</i></p> <p>There are still <i>in situ</i> training courses that are planned to push-through including the Training Course on Milkfish Culture to be held at the National Mariculture Center, Panabo City, Davao del Norte from 15-18 October 2019. This training course will only focus on milkfish culture with topics on Biology of milkfish, Broodstock management and seed production, pond preparation, and nursery and grow-out culture in ponds and cages. Other relative topics will also be discussed including the biosecurity measures/protocols and fish health management. Practical sessions such as harvesting and transport of fry as well as water quality parameters monitoring will also be conducted.</p> <p>Extension work and technology transfer of aquaculture technologies developed at SEAFDEC/AQD shall continue on 2020. Potential areas that require such seminars, hands-on workshops, trainings will be identified by BFAR</p> <p>Program objectives that will be achieved:</p> <ol style="list-style-type: none"> (1) The facilitation of technology transfers by demonstrating sustainable technologies in strategic areas nationwide to serve as skill-learning centers for fish farmers, fisherfolks, entrepreneurs, and other end-users through techno-caravan, field demonstrations and hands-on training (2) The introduction of SEAFDEC/AQD established aquaculture technologies such as: (a) environment-friendly farming of shrimp in ponds, (b) cage and pond culture of economically important marine and freshwater species (pompano, grouper, seabass, snapper, milkfish and tilapia), and (c) hatchery production of economically important marine and freshwater species (pompano, grouper, seabass, snapper, milkfish and tilapia) 		
<p>Manpower Development</p> <p>The previous trainees of the Manpower Training Course on Manpower Development for Shrimp, Marine Fish, and Tilapia Aquaculture are now assigned to a specific area or hatchery at TMS. Some of them are</p>		

Project/Activity Title	Duration	Remarks
<p>deployed to different areas in the Philippines to provide technical assistance to the projects related to the collaboration of SEAFDEC/AQD to other government agencies.</p> <p>Since the construction of some legislated hatcheries are still on-going, there is a plan to conduct another training course to produce another batch of trainees. This time, fisheries graduates from different fisheries schools mostly in Mindanao area are the target individuals to be trained and to be deployed on the constructed legislated hatcheries near their area.</p> <p>Program objectives that will be achieved:</p> <p>(1) The creation of a manpower development pool to be trained at different aquaculture disciplines which will be deployed at several government and private aquaculture facilities. Short term training courses will be tailored made for fish farmers, entrepreneurs as well as students interested in aquaculture science.</p>		
<p>Profiling of Operating / Abandoned / Non-operating Hatcheries in the Province of Iloilo, Philippines</p> <p>The profiled operating, abandoned or non-operating hatcheries in the province of Iloilo will be assessed based on the stability of the tanks, the accessibility of the area, ownership rights, etc. Some of these abandoned or non-operating hatcheries will be repaired and improved to be one of the legislated hatcheries in the province. The repair and improvement or rehabilitation of these hatcheries is under the collaboration of SEAFDEC/AQD, BFAR and the private sector.</p> <p>Program objectives that will be achieved:</p> <p>(1) The promotion of sustainable aquaculture technologies that are economically-viable, environment-friendly and socially-equitable to increase fish production, exports revenues, employment and livelihood options for the fisherfolks;</p> <p>(2) The hatchery production of economically important marine and freshwater species (pompano, grouper, seabass, snapper, milkfish and tilapia) using aquaculture technologies developed by SEAFDEC/AQD</p>		
<p>Feasibility Study of Legislated Multi-Species Hatchery</p> <p>Site evaluations and creation of engineering layouts on the remaining legislated areas shall be continued. Bidding for the multi-species marine hatcheries in Perez, Quezon (RA 10945) and Sultan Naga Dimaporo, Lanao del Norte (RA 10860) under the supervision of BFAR shall commence; if successful, construction of the said facilities may also start in 2020.</p> <p>The construction of the multi-species marine hatchery in Lingig, Surigao del Sur will be finished in 2020 and the hatchery in Del Carmen, Surigao del Norte is also expected to complete its construction around the later part of 2020. Once necessary evaluations and other requirements for the eventual operation are finished, the first run of the hatchery may already start.</p> <p>Program objectives that will be achieved:</p> <p>(1) The promotion of sustainable aquaculture technologies that are economically-viable, environment-friendly and socially-equitable to increase fish production, exports revenues, employment and livelihood options for the fisherfolks;</p>		

Project/Activity Title	Duration	Remarks
(2) The hatchery production of economically important marine and freshwater species (pompano, grouper, seabass, snapper, milkfish and tilapia) using aquaculture technologies developed by SEAFDEC/AQD.		
Low-cost feed		
<p>The project will continue in 2020 beginning with a second run of test feeding of AQD formulated feed versus commercial feeds in selected sites. Analysis of growth, survival, water parameters, proximate, and cost-and-return will be tackled.</p> <p>Upon successful experimentation, the feed formulation will be mass produced with the assistance of project partners and will then be transferred to fish farmers.</p>	2020	

4.2 Expected Outcomes/Outputs

The collaborative projects with Philippine Government agencies aims accelerate technology transfer through new thrusts. In 2020, AQD will continue strategizing to harmonize relevant research and development studies with the priorities of the host government. Through this collaborations, DA-BFAR, NFRDI and other government agencies will assist AQD in transferring adoptable and sustainable technologies to the industry and stakeholders. Fish farmers are expected to benefit from the projects as they will immediately reap the benefits of the research done by the department.

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITY FOR THE YEAR 2019-2020:
TRAINING DEPARTMENT**

Programs/Projects	Responsible Department
Project Activities Implemented in the year 2019	
1. Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building 1) Promotion and Enhancement of SEAFDEC Visibility and Image 2) Production of Information Materials 3) Management Information System 4) Human capacity building	TD
2. Improving of Fisheries Technology and Reduction of the Impact from Fishing Activities 1) Research and promotion of appropriate technologies and practices of fishing and marine engineering 2) Study on the impact on fisheries resources, marine environmental, social well-being and livelihood from fishing activities. 3) Database for fisheries management	TD
Proposed Project Activities for the Year 2020	
1. Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building 1) Promotion and Enhancement of SEAFDEC Visibility and Image 2) Production of Information Materials 3) Management Information System 4) Enhancing on human capacity building	TD
2. Improving of Fisheries Technology and Reduction of the Impact from Fishing Activities 1) Research and promotion of appropriate technologies and practices of fishing and marine engineering 2) Study on the impact on fisheries resources, marine environmental, social well-being and livelihood from fishing activities. 3) Database for fisheries management	TD

**Overall Review
of the Departmental Program Implementation in the Year 2019**

TRAINING DEPARTMENT

1. Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building

In 2019, under four main project activities, two exhibitions were conducted including a special event will be conducted in December to promotion and enhancement of SEAFDEC visibility and image. There were more than 70,000 audiences participated in these activities. In addition, two issues of Advance Fisheries Technology in the theme of “Deep sea squid and technology for exploration the deep sea resources and Refrigeration Technology for the preservation of fishery products”, were produced and distributed about 4,000 copies to TD networks and the public by mail and e-mail to enhance fisheries knowledge and public relation of TD and implementation activities.

According to management information system activity, the continuing on maintenance and development of SEAFDEC/TD repository was conducted through maintenance and update of TD’s website and integration website. Moreover, twelve national training courses were conducted and built up human capacity for staff of the Department of Fisheries, Thailand and Thai stakeholder. As well as, two tailors made training courses on fishery field were also conducted to serve requirement from donor.

2. Improving of Fisheries Technology and Reduction of the Impact from Fishing Activities

In 2019, SEAFDEC/TD conducted the study on purse seine net construction and designed with the improvement of deck machineries for Thai purse seine with the main objective to reduce manpower in purse seining. To improve the small pelagic fisheries resources survey of the region, SEAFDEC/TD is conducting three (3) activities to improve the capability of M.V. SEAFDEC 2 and human resources for the small fisheries resources survey under the activity title advanced sustainable technology *i.e.* 1) Construction and designed of midwater trawl net suitable for M.V. SEAFDEC 2 and Research vessel of Department of Fisheries Thailand, 2) Net monitoring system; and 3) Scientific echo sounder suitable for M.V. SEAFDEC 2. SEAFDEC/TD has continuously supported Department of Fisheries Thailand by improvement of fishing technology reference and technical supporting to training course *e.g.* observer onboard program training course. In addition, SEAFDEC developed training material for fishing technology for undergraduate student of Thailand. Knowledge and experience will be extended to other SEAFDEC MCs according to the requesting.

To support fisheries management of Thailand by monitoring and survey on fishing technology and other specific purpose, SEAFDEC/TD has collaborated with local agencies in Trat Province to support the formulation of local scale fisheries management which aims to strengthen the community management of coastal community in Trat Province of Thailand based on the experience to conduct few activities in the project area. In 2019, SEAFDEC technically supported to Department of Fisheries Thailand on the investigation on the push net fishing gear design and construction and provide suggestion to the research study on marking of fishing gear. SEAFDEC/TD study the type and amount of debris in the surface layer of Chao Phraya River that flows into the Gulf of Thailand and on planning develop the database on marine debris collected by bottom trawling. To carry out the research and study on the status and impact of fisheries oceanography and marine environment from fishing operation, SEAFDEC/TD is support the support the collaborative research survey of Department of Fisheries Thailand and Timor-Leste and facilitate on the follow up action of the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia, Thailand, and Viet Nam) as well as the production of the Guidebook of Scombrid Fish Larvae and Juvenile in Southeast Asia.

To strengthen the study on impact of social well-being and livelihood from fishing activities SEAFDEC/TD conducted the Economic Study on Thai Purse Seine, equipped with modern technology to evaluate benefit of purse seine fishers by the improvement of deck machineries installation to reduce manpower onboard purse seine. Study report will be finished in 2020. SEAFDEC/TD has maintained database system for fisheries resources survey in collaborate with Department of Fisheries Thailand. The database to support fisheries socio-economic and small-scale fisheries study is under conceptualize development and will be continued in 2020.

OVERALL REVIEW

SEAFDEC Departmental Programs of Activity for the Year 2019-2020:

TRAINING DEPARTMENT

1 Overall Review

1. Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building

The Information Strategies for Enhancing SEAFDEC Visibility and Communication are used as a common policy framework for information-related activities of the organization since 2006. The activities have been emphasized on raising SEAFDEC image at international, regional, national levels, and enhancing communication and information sharing both within SEAFDEC and with Member and non-Member Countries, other international/regional organizations, and the public.

In addition, the draft Plan of Action on Sustainable Fisheries for Food Security Towards 2030 which will be emphasized the enhancement of regional fishery information systems and mechanisms to facilitate sharing, exchange, and compilation of information. To prepare oncoming strategy of SEAFDEC and the Plan of Action on Sustainable Fisheries for Food Security Towards 2030 through promotion of SEAFDEC role, implementation activities, visibility and image to Member Countries, other international institutions and the public including enhancing capacity building on fishery field for relevant agencies and stakeholder, SEAFDEC/TD propose and implement the project of “Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building” under Departmental program.

The following are the major accomplishment of the program under the Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building: 1) Promotion and Enhancement of SEAFDEC Visibility and Image; 2) Production of Information Materials; 3) Management Information System; 4) Human capacity building.

2. Improving of Fisheries Technology and Reduction of the Impact from Fishing Activities

Project activities have been implemented since year 2014 which aims to promote responsible fishing technology and practices, improvement of deck machineries and catch handling onboard fishing vessel through the practical research on fishing technology and fisheries marine engineering. The project closely collaborates with Department of Fisheries Thailand and the project results are able to extend to adapt in SEAFDEC Member Countries.

In addition, the draft Plan of Action on Sustainable Fisheries for Food Security Towards 2030 which will be emphasized and the use of responsible fishing technologies, assess and manage the impacts of aquatic pollution and marine debris, including abandoned, lost, or otherwise discarded fishing gear (ALDFG) and microplastics/microbeads, on fisheries and aquaculture. Draft Plan of Action also recommend SEAFDEC and MCs to intensify research on the impacts of various fishing gear types and methods on the ecosystem and populations of aquatic animals, and develop and promote environment-friendly fishing practices, *e.g.* low impact and fuel efficient (LIFE) fishing gears/methods

Since year 2014 the project has implemented with three (3) major components, *i.e.* 1) Promotion of appropriate technologies and practices of fishing and marine engineering to enhance sustain marine fisheries resource utilization; 2) Fisheries research on impact of fishing (include fisheries resources, socioeconomic and governance) to marine ecosystem; and 3) Database to support the fisheries management for Thailand.

3. List of Projects

1. Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building
2. Improving of Fisheries Technology and Reduction of the Impact from Fishing Activities

PROJECT DOCUMENT

Program Categories: Departmental Programs

Project Title: Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building

Responsible Department: Training Department

Total Duration: 2019

Funding Sources: Training Department

Estimated Budget for 2019: 70,000 USD

1. INTRODUCTION

The Information Strategies for Enhancing SEAFDEC Visibility and Communication which was endorsed by the SEAFDEC Council in 2006 are used as a common policy framework for information-related activities of the organization. In 2009, the strategies were revised and simplified. However, they still emphasize raising SEAFDEC image at international, regional, national levels, and enhancing communication and information sharing both within SEAFDEC and with Member and non-Member Countries, other international/regional organizations, and the public.

In addition, the Plan of Action on Sustainable Fisheries for Food Security Towards 2030 which was adopted in ASEAN-SEAFDEC Regional Meeting on the Resolution and Plan of Action for ASEAN Region Toward 2030 which hold in September 2019, Bangkok, Thailand emphasize the enhancement of regional fishery information systems and mechanisms to facilitate sharing, exchange, and compilation of information.

Following the information strategy of SEAFDEC and the Plan of Action on Sustainable Fisheries for Food Security Towards 2030 through promotion of SEAFDEC role, implementation activities, visibility and image to Member Countries, other international institutions and the public including enhancing capacity building on fishery field for relevant agencies and stakeholder, SEAFDEC/TD propose and implement the project of “Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building” under Departmental program.

2. PROJECT

2.1 Goal /Overall Objectives

SEAFDEC’s role, responsibility, visibility, and image are promoted and enhanced among Member Countries, other international institutions, and the public.

2.2 Outcomes and Expected Outputs

Outcomes

- Strengthening of SEAFDEC and Department’s visibility and image
- Increasing of understanding, knowledge, and experience for relevant agencies and stakeholder in fisheries-related issues

Expected Outputs

- Understanding of the role and SEAFDEC / Departments activities
- Delivery of fisheries information to stakeholders and the public
- Hub of fishery information and capacity building on the fisheries-related issues in the region
- Building up human capacity on the fisheries-related issues

2.3 Project Description/Framework

Activity 1: Promotion and Enhancement of SEAFDEC Visibility and Image

SEAFDEC’s role and implementing activities as knowledge on fisheries information in collaboration with other SEAFDEC Departments will be promoted and enhanced among other international institutions and the public via national and international exhibitions as required and other suitable channels.

Activity 2: Production of Information Materials

Hard and soft copies such as Advance Fisheries Technology (AFT) magazine, electronic multimedia, fisheries information packages, *etc.* on fisheries information knowledge and also implementation activities will be produced. These information materials will be promoted and delivered to the public to enhance SEAFDEC visibility and image through fisheries information knowledge.

Activity 3: Management Information System

The Training Department will cooperate with other departments and other relevant agencies in sharing information on fisheries issues. Moreover, strengthening of TD information and network such as an electronic mail group, TD website and integration of relevant website has been maintained as sub-activity.

Activity 4: Human capacity building

For SEAFDEC staff

The knowledge, skill, and experience of SEAFDEC especially information staff will be enhanced and developed by relevant ICT training programs with outside institutions such as the strategy of Public relations, website design, *etc.*

For fishery stakeholder and public

The tailor-made training courses will be conducted based on the need and requirements of the partners and donors. The programs will be designed and planned out by the consultation and agreement of TD and training partners. This includes the choice of subjects, duration, location, and the target participant. Courses/programs can be conducted by combining existing training programs or new topics and programs.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project Activity Title	Duration	Remarks
1) <i>Promotion and Enhancement of SEAFDEC Visibility and Image</i> <ul style="list-style-type: none"> Exhibition on Fisheries Resource Conservation and promotion SEAFDEC and TD activities for Children Day at Pomprachunlajomklao Navy was organized. 	12 Jan 19	
<ul style="list-style-type: none"> Exhibition at the annual national fair “Pramong Nomklao” was organized in collaboration with the Department of Fisheries (DOF), Thailand. TD presented the “Squids and Automatic Squid Jigging for Exploration Fisheries Resources in Deep Sea.” In this regard, the eggs, juveniles, and mature squids, and also Automatic Squid Jigging were shown for the audiences for better understanding. Moreover, there was the distribution of various technical publications, brochures, VCDs and fishery-related souvenirs to the audiences, and the SEAFDEC visibility was promoted. 	28 Jun-7 Jul 19	
<ul style="list-style-type: none"> Special event on SEAFDEC Mini-marathon: Fishermen Run and promotion of SEAFDEC visibility 	Will be organized on 8 Dec 19	
2) <i>Production of Information Materials</i> <ul style="list-style-type: none"> Two (2) issues of Advance Fisheries Technology in the theme of “Deep sea squid and technology for exploration the deep sea resources and Refrigeration Technology for the preservation of fishery products”, was produced and distributed about 4,000 copies to TD networks and the public by mail and e-mail to enhance fisheries knowledge and public relation of TD and implementation activities. 	May and Nov 19	
3) <i>Management Information System</i> <ul style="list-style-type: none"> Maintenance and update of TD’s integration website 	Jan-Dec 19	
<ul style="list-style-type: none"> Development of TD repository 	Jan-Dec 19	
4) <i>Human capacity building</i>		
4.1) Human capacity building for national		

Project Activity Title	Duration	Remarks
<ul style="list-style-type: none"> The Workshop on Key Stakeholders' Engagement and Investigate the Current Situation which Leads to the Low Income of the Fishers of the Project in Lao PDR. There were 24 participants who are fishery officers and key stakeholders in fisheries participated in this Workshop. 	3 days 21-23 Feb. 2019	
<ul style="list-style-type: none"> The Ecosystem Approach to Fisheries Management (EAFM) Training Course in Nakhon Ratchasima Province which is located in the Eastern part of Thailand. There were 25 Thai Fisheries Officers who conduct on fishery management, human capacity development in fisheries field, and fishery extension. 	5 days 26 Feb. – 2 Mar. 2019	
<ul style="list-style-type: none"> The Training Course on Basic Principle of Fishing Gear at TD office, Samut Prakan, Thailand, aims to capacity building on the basic principle of fishing gear through the fishing situation in Thailand. There were 23 participants who are fisheries officers from the Department of Fisheries (DOF) of Thailand attended in this training course. 	10 days 13 – 22 Mar. 2019	
<ul style="list-style-type: none"> The study visit and practice of twenty-six students from the Faculty of Fisheries, Kasetsart University who learned in the subject of Coastal Navigation 	10 May 2019	
<ul style="list-style-type: none"> Workshop on key stakeholders' engagement, problem identification and fisheries management plan development in Krabi Province, Thailand. There were 30 participants who are fishery officers and key stakeholders of fisheries in Krabi Province participated in this Workshop. 	3 days 15-17 May 2019	
<ul style="list-style-type: none"> The Ecosystem Approach to Fisheries Management (EAFM) Training Course in Chiangmai Province, which is located at the northern part of Thailand. There were 20 Thai Fisheries Officers who conduct on fishery management, human capacity development in fisheries field, and fishery extension. 	5 days 27 – 31 May 2019	
<ul style="list-style-type: none"> The Short-term Training Course for University Students on Ecosystem Approach to Fisheries Management" (Batch-62). The training course was conducted at SEAFDEC/TD, there were 26 students from six difference Universities attended in the training course. 	11 days 4-14 Jun 2019	
<ul style="list-style-type: none"> The study visit to include knowledge and experience in fishing technology and relevant issues on fisheries for 27 students from Walailuk University 	26 Jun 2019	
<ul style="list-style-type: none"> Study visit and observation program aims to give the initial idea to increase income for Ban Nai Nang community, Krabi Province. There were twenty-five participants (20 women and 5 men) who are Krabi provincial fisheries officers (4 officers) and 21 participants from Ban Nai Nang community, Krabi Province. 	5 days 5 – 9 Aug. 2019	
<ul style="list-style-type: none"> The study visit to include knowledge and experience in fishing technology and relevant issues on fisheries for 107 students from Kasetsart University 	5 Oct 2019	
<ul style="list-style-type: none"> The study visit to include knowledge and experience in fishing technology and relevant issues on fisheries for 44 students from Burapha University (Chanthaburi Campus) 	26-27 Oct 2019	
<ul style="list-style-type: none"> On the job training for Thai university students and diploma student. There were 9 Thai university students and diploma student (5 male, 4 female) practice training to include experience and skill in their study 	Jan-Dec 2019	
4.2) Tailor made training		
<ul style="list-style-type: none"> The Tailor-made Training on Inland Fish Culture in Thailand for 13 fishery officers from the State of Tamil Nadu, India. 	8 days 5 – 12 Aug. 2019	
<ul style="list-style-type: none"> The Tailor-Made Training on Application of coastal Ecosystem Approach to Fisheries Management (EAFM)-learning site in Krabi Province, Thailand for 10 Sudanese. 	6 days 19-24 Aug. 2019	

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p>Activity 1: Promotion and Enhancement of SEAFDEC Visibility and Image</p> <p>National and international exhibitions as required will be organized to promote and enhance SEAFDEC's role, visibility, and image through present knowledge on fisheries information in collaboration with other SEAFDEC Departments.</p>	Jan-Dec	
<p>Activity 2: Production of Information Materials</p> <ul style="list-style-type: none"> Two (2) issues of Advance Fisheries Technology (AFT). Fisheries information package to promote awareness understanding for fishermen, stakeholders, and public will be produced. The package will include books, brochures, and CD-ROM, <i>etc.</i> 	Jan-Dec	
<p>Activity 3: Management Information System</p> <p>The Training Department will cooperate with other Departments and relevant agencies to share information on fisheries issues. Moreover, strengthening of TD information and network such as an electronic mail group, TD website, and integration of relevant website has been maintained as sub-activity.</p>	Jan-Dec	
<p>Activity 4: Enhancing on human capacity building</p> <ul style="list-style-type: none"> The knowledge, skill and experience of SEAFDEC especially information staff will be enhanced and developed by relevant ICT training program with outside institutions such as strategy of Public Relation, website design, <i>etc.</i> 	Jan-Dec	
<ul style="list-style-type: none"> The tailor-made training courses will be conducted based on the need and requirement from the partners and donors. The programs will be designed and planned out by the consultation and agreement of TD and training partners. This includes the choice of subjects, duration, location, and the target participant. Courses/programs can be conducted by combining existing training programs or a new topics and programs. 	Jan-Dec	

4.2 Expected Outcomes/Outputs

- Strengthening of SEAFDEC and Departments visibility and image
- Understanding on role and SEAFDEC / Departments activities on public
- Delivery and enhance knowledge through capacity building of fisheries issues to stakeholders and the public

PROJECT DOCUMENT

Program Categories: Departmental Programs

Project Title: Improving of Fisheries Technology and Reduction of the Impact from Fishing Activities

Responsible Department: Training Department

Total Duration: 2019

Funding Sources: Training Department

Estimated Budget for 2019: 60,000 USD

1. INTRODUCTION

Over the years, TD has initiated several projects/programs aiming to promote responsible fishing technology and practices, improvement of deck machineries and catch handling onboard fishing vessel through the practical research on fishing technology and fisheries marine engineering. This program covers a wide range of activities, implemented in collaboration with Department of Fisheries Thailand and other government agencies (*e.g.* Department of Coastal Marine and Resources, Fish Marketing Organization of Thailand, Fisheries Academies, Institutes and Universities) and local fisheries association. The activities are included with technical assistances, research and development, sea trials, and demonstrations and human resources development.

Project activities have been implemented since year 2014 with three (3) main components are 1) Promotion of appropriate technologies and practices of fishing and marine engineering to enhance sustain marine fisheries resource utilization; 2) Fisheries research on impact of fishing (include fisheries resources, socioeconomic and governance) to marine ecosystem; and 3) Database to support the fisheries management for Thailand. Since year 2018 the program has been extended to support the formulation of fisheries management plan of local communities in Thailand, based on the area that SEAFDEC training has been implement project activities in the past.

2. PROJECT

2.1 Goal /Overall Objectives

Improvement fishing technology and marine engineering to support sustainable utilization of marine fisheries resources and strengthening the national networks.

2.2 Outcomes and Expected Outputs

2.2.1 Appropriate fishing technologies and marine engineering to support sustainable fisheries by mitigating impacts of fisheries resources and marine ecosystem.

2.2.2 Base line information of the socioeconomic and gender in fisheries to support sustainable fisheries

2.2.3 Fisheries information and database support sustainable fisheries.

2.3 Project Description/Framework

Activity 1: Research and promotion of appropriate technologies and practices of fishing and marine engineering. The series of activities are emphasized on the improvement of appropriate fishing and marine engineering technology and practices including the energy saving, safety to enhance sustainable marine fisheries resource utilization. Introducing of fishing deck machineries to reduce manpower, improve fishing gear according to fishing method modification and study on economic impacted by improvement of fishing and marine engineering technology and practices is multidisciplinary research applied for these activities. Human resource development by improvement of training material of fishing technology subject for junior researcher and extension officers of Department of Fisheries, and undergraduate student of Thailand. This is included with the technical support on monitoring and survey on fishing gear, fishing boat to support Fisheries Management of Thailand and other specific purposes are also major sub activities.

Activity 2: Study on the impact on fisheries resources, marine environmental, social well-being and livelihood from fishing activities.

The activities are emphasized on the multidisciplinary research to investigate impact of habitat and ecosystem focus on fisheries resources, oceanography and marine environment from fishing operation. Socioeconomic in small-scale as well as the study on the cost and return in commercial scale fisheries are significant sub-activities.

Activity 3: Database for fisheries management

SEAFDEC Training department in collaboration with Department of Fisheries, Thailand has developed database system for managing data from the cruise resource surveys. The activities aimed to harmonize data collection for the research cruise survey on fisheries resources between Department of Fisheries, Thailand and SEAFDEC/TD. In addition, SEAFDEC has series of data collected from the coastal fisheries projects. This data has never been developed database system for socioeconomic data management.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project Activity Title	Duration	Remarks
Promotion of appropriate technologies and practices of fishing and marine engineering		
1. Study on improvement of fishing technology to enhance sustainable marine fisheries resource utilization (Improve purse seine fishing of Thailand)	Feb-Dec	
2. Research on coastal fishing activities, <i>e.g.</i> set net, bamboo stake trap, for specific proposes		
3. Advanced sustainable technology 3.1. Study on the midwater trawl net construction and designed suitable for M.V. SEAFDEC 2 and Research vessel of Department of Fisheries Thailand. 3.2. Study on the net monitoring system installed onboard M.V. SEAFDEC 2 3.3. Study on the Scientific echo sounder suitable for M.V. SEAFDEC 2	Jan-Dec	
4. Improve fishing technology reference 4.1. Training material for basic fishing technology subject for staffs of the Department of Fisheries 4.2. Training material for fishing technology subject for staffs of the Department of Fisheries (Observer onboard program) 4.3. Training material for fishing technology for undergraduate student of Thailand	Jan-Dec	
5. Support monitoring and survey on fishing technology to support fisheries management of Thailand and other specific purpose 5.1. Support of National and Local Programs and the Sustainable Development Strategy for the Seas of East Asia (Trat Province of Thailand) 5.2. Investigation on the push net fishing gear design and construction 5.3. Support the research on marking of fishing gear 5.4. Study the type and amount of debris in the surface layer of Chao Phraya River that flows into the Gulf of Thailand	Jan-Dec	
Study on the impact on fisheries resources, marine environmental, social well-being and livelihood from fishing activities		
1. Research and study on the status and impact of fisheries oceanography and marine environment from fishing operation 1.1. Support the collaborative research survey of Department of Fisheries Thailand and Timor-Leste 1.2. Facilitate the follow up activities on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia, Thailand, and Viet Nam) 1.3. Produce the reference of Scombrid Fish Larvae and Juvenile in Southeast Asia	Jan-Dec	
2. Research and study on impact of social well-being and livelihood from fishing activities (Economic Study on Thai Purse Seine, equipped with modern technology)	Feb-Dec	

Database for fisheries management		
1. Development of database system for fisheries resources survey	Jan-Dec	
2. Development of database system to support fisheries socio-economic and small-scale fisheries study		Postpone to 2020

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project Activity Title	Duration	Remarks
Promotion of appropriate technologies and practices of fishing and marine engineering		
1. Study on improvement of fishing technology to enhance sustainable marine fisheries resource utilization 1.1. Reduction of manpower in purse seine fishing operation of Thailand 1.2. Safety in fishing operation in Thailand	Jan-Dec	
2. Research on coastal fishing activities, <i>e.g.</i> set net, bamboo stake trap, for specific proposes. 2.1. Marking of fishing gear	Jan-Dec	
3. Advanced technology to support fisheries research survey 3.1. Study on the midwater trawl net construction and designed suitable for M.V. SEAFDEC 2 and Research vessel of Department of Fisheries Thailand. 3.2. Study on the Scientific echo sounder suitable for M.V. SEAFDEC 2	Jan-Dec	
4. Fishing technology reference 4.1. Training material for fishing technology subject for staffs of the Department of Fisheries (Trawl net and purse 4.2. Training material for fishing technology for undergraduate student of Thailand 4.3. Revised monograph of fishing gear of Thailand	Jan-Dec	
5. Monitoring on fishing technology to support fisheries management of Thailand and other specific purpose 5.1. Support of National and Local Programs and the Sustainable Development Strategy for the Seas of East Asia (Trat Province of Thailand)	Jan-Dec	
Study on the impact on fisheries resources, marine environmental, social well-being and livelihood from fishing activities		
1. Research and study on the status and impact of fisheries oceanography and marine environment from fishing operation. 1.1. Facilitate the presentation on the result of Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia, Thailand, and Viet Nam) in the 7 th Marine Science Conference of Thailand 1.2. Facilitating on the producing the reference of Scombrid Fish Larvae and Juvenile in Southeast Asia 1.3. Study the type and amount of debris in the surface layer of Chao Phraya River that flows into the Gulf of Thailand.	Jan-Dec	
2. Research and study on impact from fishing activities to social well-being (<i>e.g.</i> social, economic, etc.)	Feb-Dec	
Database for fisheries management		
1. Development of database system for fisheries resources survey	Jan-Dec	
2. Development of database system to support fisheries socio-economic and small-scale fisheries study	Jan-Dec	

4.2 Expected Outcomes/Outputs

- Technical Report on Purse Seine Net Modification Appropriate Design with Net Hauler and Deck Machinery.
- Update report of the research on marking of fishing gear.
- Study report and monograph drawing of mid-water trawl net.
- Training material for fishing technology subject for staffs of the Department of Fisheries and undergraduate student of Thailand.
- Study reports the type and amount of debris in the surface layer of Chao Phraya River that flows into the Gulf of Thailand.
- Draft Guidebook of Scombrid Fish Larvae and Juvenile in Southeast Asia.
- Report on the economic study on the Thai purse seine equipped with modern technology.

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITY FOR THE YEAR 2019-2020:
INLAND FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT**

Programs/Projects	Responsible Department
Project Activities Implemented in the Year 2019	
1. Stock Assessment in Inland Fisheries	IFRDMD
2. Development of Capacity Building Plan to support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules and Conducting Training of Trainers on EAFM/EAA	IFRDMD
3. Improve livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence	IFRDMD
4. Modernizing irrigated agriculture to protect and restore aquatic biodiversity and ecosystem services in South-East Asia	IFRDMD
Proposed Project Activities for the Year 2020	
1. Stock Assessment in Inland Fisheries	IFRDMD
2. Improve livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence	IFRDMD
3. Modernizing irrigated agriculture to protect and restore aquatic biodiversity and ecosystem services in South-East Asia	IFRDMD

**Overall Review
of the Departmental Program Implementation in the Year 2019**

**INLAND FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT
(IFRDMD)**

1. Fish Stock Assessment and Production Potential of Inland Fisheries

Inland waters in Indonesia have enormous potential if viewed from the aspect of area and biodiversity, especially fish. If viewed from the aspect of area with the total catch, it is still underestimated, in other words, lack of statistical data. So, it is necessary to conduct stock studies using analytical methods (more detailed and more reliable data) and holistic methods (simpler data). Simple holistic methods do not use age or long structures and regard stock as a homogeneous biomass. The two types of simple methods are the 'swept area' method which is based on "catch per unit area" to estimate biomass and MSY. The "surplus production model" method uses catch per unit effort. Important information that can be used as a basis for rational management of fish resources, among others, is the knowledge of the magnitude of resources, distribution, and behavior according to place and time (spatial and temporal). Some important aspects of population dynamics include population/community structure, size composition (length, weight), growth rate, and mortality rate. The research activity used to issue overall stock figures from each province in Indonesia are something that is very important for the development of Indonesian public water fisheries. The results of the data and information can be references in the development and contribution of information regarding the potential and production of mainland public waters to national fisheries.

To find value of and fish production potential, maximum sustainable yield and total catch on inland fisheries are determined by these methods:

1. Measurement of the stocks uses bio sonic methods and swept area methods (Peterson methods). Measurement of the value of stocks in river, reservoir and lakes uses bio sonic method, and the flood plain area measurement uses swept area methods (mark-recapture methods).
2. Measurement of the fish potential production in lake, reservoir and flood plain uses chlorophyll-a methods meanwhile river area measurement uses Leger Huet's methods
3. Measurement of the maximum sustainable yield (MSY) on multi species uses surplus production, and the dominant species measurement uses analytical methods.

Measurement of the total catch determined by using Enumerator and direct interview with the fisherman. Every enumerator recorded six forms that must be filled in (length frequency form, biology form, total catch form, validation form, fishing gear form and daily catch form)

2. Development of Capacity Building Plan to support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules and Conducting Training of Trainers on EAFM/EAA

This project start from 2019 to prepare development and/or improvement of Capacity Building Plan to support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules, and Conducting Training of Trainers on EAFM/EAA at 5 location (Cilacap District, Sukabumi distric, Kampar distric, Kapuas distric and South Barito distric) IFISH Project. The Service provider will produce, achieve or deliver the following as output:

- 1.1 Assessment report on capacity building needs for different target stakeholders at different levels to fully achieve the project objectives;
- 1.1 Capacity building plan for sustainable management of inland aquatic resources, focusing on mainstreaming biodiversity, developed at national and district levels based on the need assessment; and
- 1.1 Mechanisms for implementation of capacity building plan at both national and local government levels identified.
- 1.1 EAFM/EAA training modules developed considering the most recent insights, current best practices and tailored to the intended target audiences to optimize uptake of fisheries management practices based on EAFM/EAA principles.
- 1.1 Training capacity for conducting EAFM/EAA training for local level stakeholders developed at national and provincial levels.

3. Improve livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence

The project on "Mainstreaming Biodiversity Conservation and Sustainable Use into Inland Fisheries Practices in Freshwater Ecosystems of High Conservation Value" (GCP/INS/303/GFF-IFish) The project intends to combine mainstreaming of inland aquatic biodiversity into resource development and management policy, with demonstrations of conservation and sustainable use of inland aquatic biodiversity in critical habitats at four sites in Kalimantan, Java and Sumatra, and effective monitoring and assessment Clown knife fish (*Chitala lopis*) is one of the economically important fish in Indonesia. The Indonesian government has recognized the importance of the threats to clown knife fish by enacting regulation to protect clown knife fish populations and those of other *Chitala* species through a Ministerial Decree. Beside fisheries regulation, for sustainable utilization of the clown knife fish resources, management measures such as habitat rehabilitation and conservation, restocking and aquaculture development should be carried out. Successful experimental Clown knife fish breeding has been developed by several groups, including by the Freshwater Aquaculture Institute Mandiangin in South Kalimantan, but have so far not been implemented at commercial scale nor have they been successfully done with *Chitala* species found in Kampar. In close coordination with the project team, the Service Provider (SP) will implement activities in Kampar District, Riau Province, to demonstrate Clown knife fish breeding, operation of hatchery and nursery facilities for that there are output these project:

1. Clown Knife culture management plan, with practical approaches for implementing more sustainable and ecological aware (from environmental pollution)
2. Produce clown knife fish fry from hatchery for restocking in the lake/ Lubuk Larangan and for grow out in the net cages cultured by fish farmers in Koto Panjang reservoir (minimum 20,000 fry)
3. 1,000 persons (fish farmers, fishers, communities which is 30% women) trained, disseminate and extension on good aquaculture practices and EAFM/EAA

4. Modernizing irrigated agriculture to protect and restore aquatic biodiversity and ecosystem services in South-East Asia

The project will develop the tools, guidelines and in-country capacities required to more systematically include biodiversity and ecosystem service considerations in irrigation rehabilitation, extension and modernization programs. Irrigation investment programs, collectively worth billions of dollars in the region, coupled with increased awareness of the benefits of multi-functional ecosystems, provide the opportunity to apply considerable Australian expertise and technology to aquatic ecosystem management in the Southeast Asian region. The activity will be access and collation of existing expertise in Australia and across the South East Asian region, translated into detailed and context-specific technical guidelines and training materials. Extensive stakeholder consultation and buy-in, targeting champions and practitioners in Indonesia and Myanmar Capacity development and training program targeting local champions and decision-makers and utilizing approaches and techniques derived from the latest innovations in adult education and ICTs to achieve sustained behavior change. Aligning with existing on-ground initiatives (funded by CSU and ACIAR) in Myanmar seeking to improve fisheries productivity at irrigation infrastructure using engineering solutions. Technological options need to be accompanied by the improvement of policy, regulation and management arrangements to enable integration of aquatic biodiversity, fisheries and ecosystem services in irrigated areas (which at present are typically managed separately). Capitalizing on this opportunity is essential if we are to maximize future productivity while also preventing further ecosystem decline, biodiversity loss and loss of freshwater fisheries. Finally, the project aim to:

1. Developing materials for technical and policy guidance, and resource mobilization
2. Stakeholder consultation and buy-in and Dissemination
3. Improve capacity development at national and regional levels.

SEAFDEC Departmental Programs of Activity for the Year 2019-2020

Inland Fishery Resources Development and Management Department (IFRDMD)

1. Overall Review

1.1 Fish Stock Assessment and Production Potential of Inland Fisheries

This project will be continue for data validation with minimum standard and it's necessary to conduct stock studies using analytical methods (more detailed and more reliable data) and holistic methods (simpler data). Simple holistic methods do not use age or long structures and regard stock as a homogeneous biomass. The two types of simple methods are the 'swept area' method which is based on "catch per unit area" to estimate biomass and MSY. The "surplus production model" method uses catch per unit effort. Important information that can be used as a basis for rational management of fish resources, among others, is the knowledge of the magnitude of resources, distribution, and behavior according to place and time (spatial and temporal). Some important aspects of population dynamics include population/community structure, size composition (length, weight), growth rate, and mortality rate. The research activity used to issue overall stock figures from each province in Indonesia are something that is very important for the development of Indonesian public water fisheries. The results of the data and information can be references in the development and contribution of information regarding the potential and production of mainland public waters to national fisheries.

To find value of and fish production potential, maximum sustainable yield and total catch on inland fisheries are determined by these methods:

1. Measurement of the stocks uses bio sonic methods and swept area methods (Peterson methods). Measurement of the value of stocks in river, reservoir and lakes uses bio sonic method, and the flood plain area measurement uses swept area methods (mark-recapture methods).
2. Measurement of the fish potential production in lake, reservoir and flood plain uses chlorophyll-a methods meanwhile river area measurement uses Leger Huet's methods
3. Measurement of the maximum sustainable yield (MSY) on multi species uses surplus production, and the dominant species measurement uses analytical methods.

Measurement of the total catch determined by using Enumerator and direct interview with the fisherman. Every enumerator recorded six forms that must be filled in (length frequency form, biology form, total catch form, validation form, fishing gear form and daily catch form)

1.2 Improve livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence

The project start from 2019 into 2020 and it's intends to combine mainstreaming of inland aquatic biodiversity into resource development and management policy, with demonstrations of conservation and sustainable use of inland aquatic biodiversity in critical habitats at four sites in Kalimantan, Java and Sumatra, and effective monitoring and assessment Clown knife fish (*Chitala lopis*) is one of the economically important fish in Indonesia. The Indonesian government has recognized the importance of the threats to clown knife fish by enacting regulation to protect clown knife fish populations and those of other *Chitala* species through a Ministerial Decree. Beside fisheries regulation, for sustainable utilization of the clown knife fish resources, management measures such as habitat rehabilitation and conservation, restocking and aquaculture development should be carried out. Successful experimental Clown knife fish breeding has been developed by several groups, including by the Freshwater Aquaculture Institute Mandiangin in South Kalimantan, but have so far not been implemented at commercial scale nor have they been successfully done with *Chitala* species found in Kampar. In close coordination with the project team, the Service Provider (SP) will implement activities in Kampar District, Riau Province, to demonstrate Clown knife fish breeding, operation of hatchery and nursery facilities for that there are output these project:

1. Clown Knife culture management plan, with practical approaches for implementing more sustainable and ecological aware (from environmental pollution)
2. Produce clown knife fish fry from hatchery for restocking in the lake/ Lubuk Larangan and for grow out in the net cages cultured by fish farmers in Koto Panjang reservoir (minimum 20,000 fry)
3. 1,000 persons (fish farmers, fishers, communities which is 30% women) trained, disseminate and extension on good aquaculture practices and EAFM/EAA

1.3 Modernizing irrigated agriculture to protect and restore aquatic biodiversity and ecosystem services in South-East Asia

The project will develop the tools, guidelines and in-country capacities required to more systematically include biodiversity and ecosystem service considerations in irrigation rehabilitation, extension and modernization programs. Irrigation infrastructure (water storage, delivery and drainage systems) was designed with the sole purpose of achieving efficient water delivery for agricultural crops such as rice. This had wide ranging, and often negative, impacts on water resources and the aquatic ecosystems and fisheries that are dependent upon them. To avoid and reduce such negative impacts in new or rehabilitated irrigation schemes, irrigation managers need to find technological options (incorporating new design features, changing design) and policy solutions (e.g. by introducing new environmental policies, legislation and best-practice guidelines).

Technological options need to be accompanied by the improvement of policy, regulation and management arrangements to enable integration of aquatic biodiversity, fisheries and ecosystem services in irrigated areas (which at present are typically managed separately). Capitalizing on this opportunity is essential if we are to maximize future productivity while also preventing further ecosystem decline, biodiversity loss and loss of freshwater fisheries. Finally, the project aim to:

1. Developing materials for technical and policy guidance, and resource mobilization
2. Stakeholder consultation and buy-in and Dissemination
3. Improve capacity development at national and regional levels.

1.1 List of Projects

1. Stock Assessment in Inland Fisheries
2. Improve livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence
3. Modernizing irrigated agriculture to protect and restore aquatic biodiversity and ecosystem services in South-East Asia.

PROJECT DOCUMENT

Program Categories: Departmental Programs (Project under Ministry of Marine Affairs and Fisheries)

Project Title: Fish Stock Assessment

Responsible Department: RIIFE-IFRDMD

Total Duration: 2017 – 2020

Funding Sources: Indonesia Government

Estimated Budget for 2020: USD 221,831

1. INTRODUCTION

The Fisheries Management Area (FMA) is Called WPP PD in Indonesia is a management tool that is applied to specifically delineate of Inland fisheries area. Globally, FMA/WPP-PUD is an implementation of the implementation of an ecosystem approach in the management of capture fisheries in inland fisheries. The purpose and objective of this activity is to determine the amount of fish stocks, production potential, sustainable potential yield (MSY) and total catch that can be used as a basis for fisheries management in the Indonesian inland waters. With the data obtained on the numbers above in each KPP-PUD that has been determined, it is expected that it will facilitate the development and management of fisheries and the conservation of fish resources in inland fisheries that are sustainable so that synergy and integration among the inland waters is achieved.

Inland fisheries are aquatic ecosystems that are vulnerable to pollution and are complex and have high diversity. Many types of fish that are endemic and isolated cannot spread easily between different ecosystems. Based on existing data, some species of fish have decreased; threatened with extinction and become scarce and even disappear. Constraints, problems and issues that occur in the mainland water resources are complex and multi-dimensional. Some prominent issues that can be identified include reduction in the quantity and quality of aquatic resources as a result of development by the agricultural sector as well as other sectors of public interest, conflicts over resource use among stakeholders, utilization of excess fishing activities such as occurring in several water bodies.

2. PROJECT

2.1 Goal /Overall Objectives

Establishing of Fish stocks and fish production Potential on Fisheries Management Area number 439, 437, 421, 422, 413 and 434

2.2 Outcomes and Expected Outputs

Outcomes

Fisheries management area on FMA number 439, 437, 421, 422, 413 and 434

Outputs

Value of fish stocks, MSY, fish production potential and total catch

2.3 Project Description/Framework

Activity 1: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 439

Activity 2: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 437

Activity 3: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 434

Activity 4: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 422

Activity 5: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 422

Activity 6: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 413

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project/Activity Title	Duration	Remarks
<ul style="list-style-type: none"> Value of fish stock, fish production on different ecosystem, types of fishing gear that can be operated, fishing gear specifications Included the size of fishing gear and total catch on FMA number 439 	Feb, May, Jul	
<ul style="list-style-type: none"> Value of fish stock, fish production on different ecosystem, types of fishing gear that can be operated, fishing gear specifications Included the size of fishing gear and total catch on FMA number 437 	Mar, Jun, Aug,	
<ul style="list-style-type: none"> Value of fish stock, fish production on different ecosystem, types of fishing gear that can be operated, fishing gear specifications Included the size of fishing gear and total catch on FMA number 434 	Mar, Jun, Aug,	
<ul style="list-style-type: none"> Value of fish stock, fish production on different ecosystem, types of fishing gear that can be operated, fishing gear specifications Included the size of fishing gear and total catch on FMA number 422 	Mar, Jun, Aug, Feb, May, Jul	
<ul style="list-style-type: none"> Value of fish stock, fish production on different ecosystem, types of fishing gear that can be operated, fishing gear specifications Included the size of fishing gear and total catch on FMA number 421 		
<ul style="list-style-type: none"> Value of fish stock, fish production on different ecosystem, types of fishing gear that can be operated, fishing gear specifications Included the size of fishing gear and total catch on FMA number 413 	Feb, May, Jul	

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

2. Project/Activity Title	Duration	Remarks
Activity 1 Determined of Fish stocks and production potential of Inland Fisheries in FMA number 438	Feb, May, Jul, Sep, Dec	
Activity 2 Determined of Fish stocks and production potential of Inland Fisheries in FMA number 433	Mar, Jun, Aug, Dec	
Activity 3 Determined of Fish stocks and production potential of Inland Fisheries in FMA number 412	Feb, Apr, Jul, Dec	
Activity 4 Determined of Fish stocks and production potential of Inland Fisheries in FMA number 413	Mar, May, Aug, Dec	
Activity 5 Determined of Fish stocks and production potential of Inland Fisheries in FMA number 422	Feb, May, Jul, Sep, Dec	
Activity 6 Determined of Fish stocks and production potential of Inland Fisheries in FMA number 421	Mar, Jun, Sep, Dec	
Activity 7 Determined of Fish stocks and production potential of Inland Fisheries in FMA number 411	Mar, Jun, Sep, Dec	
Activity 7 Determined of Fish stocks and production potential of Inland Fisheries in FMA number 411	Mar, Jun, Sep, Dec	

4.2 Expected Outcomes/Outputs

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	Value of fish stocks, MSY, fish production potential and total catch on FMA number 438
Activity 2	Value of fish stocks, MSY, fish production potential and total catch on FMA number 432
Activity 3	Value of fish stocks, MSY, fish production potential and total catch on FMA number 412
Activity 4	Value of fish stocks, MSY, fish production potential and total catch on FMA number 422
Activity 5	Value of fish stocks, MSY, fish production potential and total catch on FMA number 413
Activity 6	Value of fish stocks, MSY, fish production potential and total catch on FMA number 421

PROJECT DOCUMENT

Program Categories: Departmental Programs

Project Title: Development of Capacity Building Plan to Support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules and Conducting Training of Trainers on EAFM/EAA

Responsible Department: IFRDMD

Total Duration: 2019

Funding Sources: Food and Agriculture Organization of the United Nations (FAO)

Estimated Budget for 2020: USD -

1. INTRODUCTION

The Food and Agriculture Organization of the United Nations (hereinafter referred to as "FAO") and SEAFDEC/IFRDMD (hereinafter referred to as the "Service Provider") (together hereinafter referred to as the "Parties") have agreed that the Service Provider will provide certain services defined in detail in the attached Annex (the "Services") which forms an integral part of this Letter of Agreement (hereinafter the "Agreement") in support of the FAO Project GCP/INS/303/GFF- Mainstreaming Biodiversity Conservation and Sustainable Use Into Inland Fisheries Practices in Freshwater Ecosystems of High Conservation Value (FSP). This project start from 2019 to prepare development and/or improvement of Capacity Building Plan to support Management of Inland Aquatic Resources, Development of EAFM/EAA Training Modules, and Conducting Training of Trainers on EAFM/EAA at 5 location (Cilacap District, Sukabumi district, Kampar district, Kapuas district and South Barito district) by I-FISH Project.

2. PROJECT

2.1 Goal /Overall Objectives

Objective

Increase and improve provision of goods and services from agriculture, forestry, and fisheries in a sustainable manner and prepare development and/or improvement of capacity building plan to support management of inland aquatic resource, development of EAFM/EAA training modules, and conducting of trainers on EAFM/EAA at 5 locations (Cilacap District, Sukabumi district, Kampar district, Kapuas district and South Barito district)

2.2 Outcomes and Expected Outputs

Outcomes

Improvement capacity building of stakeholder for Fisheries management based on ecosystem approach.

Outputs

Capacity building plan for sustainable management of inland aquatic resources, focusing on mainstreaming biodiversity, developed at national and district levels based on the need assessment, EAFM/EAA training modules and workshop for training capacity.

2.3 Project Description/Framework

Activity 1: Prepare detailed workplan for delivering the expected outputs including targets, activities and implementation methodology with tentative timetable

Activity 2: Conduct assessment of capacity building needs for different stakeholders at national, provincial, district and community level

Activity 3: Compile and making report from stakeholder and need assessment consultation reports from national report and verification workshop report.

Activity 4: Prepare a capacity building plan at national level and for project districts

Activity 5: Develop EAFM/EAA training module

Activity 6: Conduct training with trainers specification on EAFM/EAA

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project/Activity Title	Duration	Remarks
Activity 1 Inception report meeting and making time table for conducting assessment.	June, July	
Activity 2 Compile and complete several report from stakeholder and need assessment consultation reports from distric and provincial level, verification workshop report.	July, August	
Activity 3 Compile and making report from stakeholder and need assessment consultation reports from national report and verification workshop report.	Oct, Nov	
Activity 3 Implementation of capacity building plan at both national and local government levels identified	Nov	
Activity 5 Developed EAFM/EAA training module considering the most recent insights, current best practices and tailored to the intended target audiences to optimize uptake of fisheries management practices based on EAFM/EAA principles	Nov	
Activity 6 Training capacity for conducting EAFM/EAA training for local level stakeholders developed at national and provincial levels	Nov, Dec	

PROJECT DOCUMENT

Program Categories: Departmental Programs

Project Title: Improve livelihoods from Responsible Fisheries and Capacity for Conservation, by Preserving Clown Knife Fish Habitats and Protecting their Occurrence

Responsible Department: IFRDMD

Total Duration: 2019-2020

Funding Sources: Food and Agriculture Organization of the United Nations (FAO)

Estimated Budget for 2020: USD 30,223

1. INTRODUCTION

The project on "Mainstreaming Biodiversity Conservation and Sustainable Use into Inland Fisheries Practices in Freshwater Ecosystems of High Conservation Value" (GCP/INS/303/GFF-IFish) The project intends to combine mainstreaming of inland aquatic biodiversity into resource development and management policy, with demonstrations of conservation and sustainable use of inland aquatic biodiversity in critical habitats at four sites in Kalimantan, Java and Sumatra, and effective monitoring and assessment Clown knife fish (*Chitala lopis*) is one of the economically important fish in Indonesia. The Indonesian government has recognized the importance of the threats to clown knife fish by enacting regulation to protect clown knife fish populations and those of other *Chitala* species through a Ministerial Decree. Beside fisheries regulation, for sustainable utilization of the clown knife fish resources, management measures such as habitat rehabilitation and conservation, restocking and aquaculture development should be carried out. Successful experimental Clown knife fish breeding has been developed by several groups, including by the Freshwater Aquaculture Institute (Balai Budidaya Air Tawar/BBAT) Mandiangin in South Kalimantan, but have so far not been implemented at commercial scale nor have they been successfully done with *Chitala* species found in Kampar. In close coordination with the project team, the Service Provider (SP) will implement activities in Kampar District, Riau Province, to demonstrate Clown knife fish breeding, operation of hatchery and nursery facilities for that there are output these project:

- a. Clown Knife culture management plan, with practical approaches for implementing more sustainable and ecological aware (from environmental pollution)
- b. Produce clown knife fish fry from hatchery for restocking in the lake and for grow out in the net cages cultured by fish farmers in Koto Panjang reservoir (minimum 20,000 fry)
1,000 persons (fish farmers, fishers, communities which is 30% women) trained, disseminate and extension on good aquaculture practices and EAFM/EAA.

2. PROJECT

2.1 Goal /Overall Objectives

Objective

Establish a Detailed Master Plan for the Clown Knife fish culture demonstration, activities, implement good practices on Clown knife fish culture and responsible aquaculture activities, including provision of feed and monitor and provide ongoing support during culture period, ensuring evaluation and dissemination of results to stakeholders

2.2 Outcomes and Expected Outputs

Outcomes

Improvement capacity building of stakeholder for Fisheries management based on ecosystem approach.

Outputs

Culture management plan with practical approaches for implementing more sustainable and ecological aware (from environmental pollution) of Clown Knife Fish, Produce 20,000 clown knife fish fry from hatchery for restocking and Trained, disseminated and extension of 1000 person stake holder on good aquaculture practices and EAFM/EAA

2.3 Project Description/Framework

- Activity 1: Prepare detailed workplan for delivering the expected outputs including targets, activities and implementation methodology with tentative timetable
- Activity 2: Workshop for one day training how to collecting data to identify of captures fish production.
- Activity 3: Clean River (Kampar) Campaign And Training Of Responsible And Campaign And Training Of Responsible Aquaculture In Kampar District
- Activity 4: Preparing brood stock and domestication in fond
- Activity 5: Monthly monitoring of gonad maturation to select brood stock for natural spawning.
- Activity 6: Conducting training, dissemination for local farmer, fishers and the community how to good aquaculture practices base on EAFM / EAA.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project/Activity Title	Duration	Remarks
Activity 1 Inception report meeting and making time table to prepare domestication and provide broodstock	May	
Activity 2 Workshop for one day training how to collecting data to identify of captures fish production.	June	
Activity 3 Clean River (Kampar) Campaign And Training Of Responsible And Campaign And Training Of Responsible Aquaculture In Kampar District	July	
Activity 4 Preparing broodstock in fond for maturation of gonad and domestication	Oct, Nov	
Activity 5 Monthly monitoring of gonad maturation to select broodstock for natural spawning.	Nov, Dec	
Activity 6 Conducting training, dissemination for local farmer, fishers and the community how to good aquaculture practices base on EAFM / EAA.	Nov, Dec	

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1 Restocking and distribution of Clown Knife Fish seeds to local farmers	Jan	
Activity 2 Prepare guideline and disseminate for hatchery and spawning of Clown Knife fish	Jun	
Activity Conducting workshop for dissemination to support local stakeholder activities, evaluation and officially submit all of the document	March	
Activity 4 To prepare the final and financial reports	April	

4.2 Expected Outcomes/Outputs

Proposed Activity	Expected Outcomes/Outputs of Activity	Duration
Activity 1	Fingerling of Clown Knife fish for restocking on Koto Panjang Reservoir	Jan
Activity 2	A book and guideline related to spawning, hatchery and domestication of clown knife fish	Feb
Activity 3	Workshops for dissemination report to support local stakeholder activities and evaluation before officially submit.	Mar
Activity 4	Report and document how to hatchery, domestication and Protecting of Clown Knife Fish	April

PROJECT DOCUMENT

Program Categories: Departmental Programs

Project Title: Modernizing Irrigated Agriculture to Protect and Restore Aquatic Biodiversity and Ecosystem Services in Southeast Asia

Responsible Department: IFRDMD

Total Duration: 2019-2021

Funding Sources: Food and Agriculture Organization of the United Nations (FAO)

Estimated Budget for 2020: USD 47,000

1. INTRODUCTION

Asia contains 70% of the world's irrigated area, where 34% of cultivated land is irrigated, as compared to only 10% in North America and 6% in Africa. Irrigation has been largely developed to secure rice productivity. However, in many countries, and especially in Southeast Asia, fish comprise the main animal-source protein – for instance, in the four countries of the Lower Mekong Basin, freshwater fish and other aquatic animals make up 50-80% of animal protein consumed by people.

Irrigation infrastructure (water storage, delivery and drainage systems) was designed with the sole purpose of achieving efficient water delivery for agricultural crops such as rice. This had wide ranging, and often negative, impacts on water resources and the aquatic ecosystems and fisheries that are dependent upon them. To avoid and reduce such negative impacts in new or rehabilitated irrigation schemes, irrigation managers need to find technological options (incorporating new design features, changing design) and policy solutions (*e.g.* by introducing new environmental policies, legislation and best-practice guidelines).

Although the increase in crop productivity and associated improved food security due to expanded irrigation have been fundamental to the rapid fall in extreme poverty in many Asian countries, the impact on freshwater biodiversity and associated ecosystem services has been less well documented. Some of the impacts have been positive, with the extension of aquatic regimes and inadvertent creation of wetlands and habitat, elsewhere there have been negative impacts on fish migration and water connectivity, water flows and the loss of natural habitat. This has in turn limited opportunities for food security and nutrition from wild capture fisheries, as well as resulted in the loss of biodiversity in the systems affected by connectivity losses. The World Wildlife Fund's (WWF) Living Planet Index shows that the decline in freshwater species is closely correlated with the expansion of irrigation.

2. PROJECT

2.1 Goal /Overall Objectives

Objective

Develop technical guidelines for the design and operation of irrigation infrastructure to sustain freshwater fisheries productivity and conserve aquatic biodiversity, Build institutional and policy-level awareness in Myanmar and Indonesia of processes and benefits of integrating the design of irrigation infrastructure with enhancement of natural resource productivity and biodiversity and Disseminate processes and build capacity at national and regional levels to manage irrigation infrastructure for improved productivity of irrigated agriculture and living aquatic resources.

2.2 Outcomes and Expected Outputs

Outcomes

Improved technical and policy-making capacities for practitioners and decision makers from the agriculture, environment and irrigation sub-sectors with regard to best-practice agricultural water management for enhancing aquatic biodiversity and protecting ecosystem services, Increased coordination between ministries (and stakeholders) in the agriculture/irrigation and NRM/environment sectors, New technical and policy understanding among academic institutions, farmers, NGOs and other key stakeholders relevant to water management, aquatic biodiversity and ecosystem services of water, Enhanced national government capacity to design technically-sound and bankable irrigation and environment projects for government and/or donor funding,

Outputs

To developing materials for technical and policy guidance, and resource mobilization Stakeholder consultation and buy-in and Dissemination and capacity development at national and regional levels.

2.3 Project Description/Framework

- Activity 1: Exchange contracts and inception meeting
- Activity 2: Initial stakeholder consultations
- Activity 3: Perform desktop review
- Activity 4: Outcomes workshop
- Activity 5: Develop guidelines
- Activity 6: Indonesia and Myanmar consultation

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

Project/Activity Title	Duration	Remarks
Activity 1 Exchange contracts and inception meeting	Sept	
Activity 2 Initial stakeholder consultations	Nov	
Activity 3 Perform desktop review	Dec	

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1 Developing materials for technical and policy guidance	Jan-June	
Activity 2 Stakeholder consultation and buy-in	Jun-Nov	
Activity 3 Dissemination and capacity building at national and regional levels	Dec	

4.2 Expected Outcomes/Outputs

Proposed Activity	Expected Outcomes/Outputs of Activity	Duration
Activity 1	Annual progress and delivery of global guidelines	June
Activity 2	Workshop report to capture agreed outcomes Ministerial agreement letter validating a way forward	Nov
Activity 3	Environmentally friendly irrigation implemented using accepted international guidelines	Dec

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2019
AND
PROPOSED ACTIVITY FOR YEAR 2020**

				Project id: 201801010
Program Categories:	Other Program			
Project Title:	Implementing the Lower Mekong Fish Passage Initiative in Cambodia, Thailand, and Viet Nam			
Program Thrust:	Program Thrust No.	Total Duration:	2018 - 2020	
Lead Department:	Training Department	Lead Country:	Thailand	
Donor/Sponsor:	USAID - DOI	Total Donor Budget:	USD 466,000	
Project Partner:	None	Budget for 2020:	USD 243,209	
Project leader:	Yuttana Theparoonrat	Involved Country:	Cambodia, Thailand, Viet Nam, Lao PDR	

1. INTRODUCTION/BACKGROUND

Freshwater fish provide the primary source of protein for more than 60 million residents of the Lower Mekong. Much of this resource derives not from the main stem of the Mekong River, but from the thousands of far smaller water bodies that traverse the region. Smaller water bodies are essential for fisheries production, providing breeding and nursery habitat for a large proportion of artisanal and commercial fisheries. These water bodies are becoming increasingly fragmented by weirs, dikes, dams, road prisms, and associated water management structures, mostly associated with agricultural development and local flood control activities. These development activities are providing productivity boosts for rice farmers, but are impacting fisheries production, and adversely impacting the communities reliant upon them for income and nutrition.

The November 2016 SIM-sponsored Lower Mekong Fish Passage Conference in Vientiane, Lao PDR focused on the challenges of addressing fish passage at planned Mekong River and major tributary hydropower facilities across the region (Myanmar, Viet Nam and Cambodia). However, a consistent theme voiced by the more than 160 conference participants from 15 nations was the need to expand the inventory, restoration prioritization, and restoration of the thousands of existing barriers that fragment fish populations and, by extension, threaten local food security, across the Region. There was also a demonstrated need to establish fish passage demonstration sites in other countries to build regional momentum that can help to recover fisheries productivity on a broader catchment scale.

Established techniques already exist to restore passage at many of these barriers, which were largely developed in Lao PDR. However, government agencies throughout the region have very limited technical capacity to conduct many of these activities. This Project supports the broader SIM effort to transfer knowledge to five Lower Mekong nations (Burma, Cambodia, Lao PDR, Viet Nam, and Thailand) regarding fish passage barrier inventory and prioritization processes, low head fish passage design and construction, and post-construction fish passage facility monitoring.

On August 15, 2013, DOI-International Technical Assistance Program (ITAP) entered into an Interagency Agreement (IAA) with USAID/RDMA, the stated purpose of which is for DOI-ITAP to “implement technical assistance activities that support Presidential Initiatives in global climate change (adaptation, clean energy, sustainable landscapes, and low emission development strategy), food security, and global health. DOI may also work in priority program areas of biodiversity, science and technology exchange, public-private partnerships, disaster assistance and risk reduction, economic growth, and good governance.”

DOI is a world leader in the management of natural resources. With its depth of applied knowledge, through the ITAP program, DOI provides technical assistance to countries around the globe in the areas of protected area management and conservation, fisheries, and water resource management. At the request of USAID/RDMA, DOI’s technical assistance enables government to government capacity building to SEAFDEC (an intergovernmental organization) and the ASEAN Member States (AMS).

The Southeast Asian Fisheries Development Center (SEAFDEC) is a non-profit intergovernmental organization established in 1967 to promote sustainable fisheries development in the Southeast Asian region. SEAFDEC currently comprises 11 Member Countries, namely: Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam. For almost 50 years SEAFDEC has been implementing activities to support its Member Countries in Southeast Asia as follows; 1) exploration of marine fishery resources and its utilization, 2) conservation and management of aquatic species under international concern, 3) sustainable aquaculture development, 4) fisheries post-harvest and safety of fish and fishery products, 5) promoting management for sustainable fisheries and addressing emerging international fisheries-related issues.

2. PROJECT

2.1 Goal/Overall Objectives

The objectives of the project are to build capacity within with SEAFDEC and Lower Mekong nations to construct and maintain low head fish passes to restore fisheries connectivity at irrigation facilities, weirs, and road prisms.

The three (3) specific objectives are the following:

Objective 1: Provide technical and administrative oversight of Field Fish Passage Barrier Inventories conducted by Ministry personnel in Cambodia, Thailand, and Viet Nam.

Objective 2: Design and Construct One (1) Demonstration Fish Pass in Cambodia, One (1) Demonstration Fish Pass in Thailand, and One (1) Demonstration Fish Pass in Viet Nam.

Objective 3: Project Administration and Coordination, including providing a single point of contact (“project officer”) to DOI, and documenting project activities in SEAFDEC publications and other media.

2.2 Expected Outcomes and Outputs

The ultimate outcomes of the project are

1. Appropriate construction site selection for demonstration fish passage in Cambodia, Thailand and Viet Nam
2. Demonstration fish passage construction in Cambodia, Thailand and Viet Nam
3. Distribution of demonstration fish passage technical information
4. The major project outputs include:
5. Report of fish passage barrier inventories in Cambodia, Thailand, and Viet Nam.
6. Enhance the capacity of participants on GIS approaches to fish passage barrier inventory and Engineering design and construction procedures for Low-head fish passage.
7. Dissemination of project activities document in SEAFDEC publications and other media

2.3 Project Description/Framework

Activity 1: Coordinate Field Fish Passage Barrier Inventories in Cambodia, Thailand, and Viet Nam.

Sub-activity

- 1.1 Support Cambodia Inland Fisheries Research and Development Institute (IFRDI) and Viet Nam Directorate of Fisheries (VDOP) vehicle maintenance or rental/fuel/lodging/ DSA/field equipment, as needed.
- 1.2 Participate in training workshops.
- 1.3 Participate in on-ground inventories in each country.

Activity 2: Construct One (1) Demonstration fish pass in Cambodia, One (1) Demonstration fish pass in Thailand, and One (1) Demonstration fish pass in Viet Nam.

Sub-activity:

- 2.1 In collaboration with DOI and Charles Stuart University (CSU), develop appropriate technical specifications that suit the swimming ability of local species and hydrology of the selected sites.
- 2.2 Host and provide space for a workshop between DOI, CSU, and all partner ministries on Engineering Design and Construction Procedures for Low-Head Fish Passes.
- 2.3 Host and provide space for a workshop between DOI, CSU, and all partner ministries on GIS Approaches to Fish Passage Barrier Inventory.
- 2.4 Using final technical specifications, site locations, and funding levels provided by DOI, identify and contract with a qualified contractor in each nation to conduct all site surveys and construction activities.

- 2.5 Respond to requests from all relevant government agencies with environmental or other permitting responsibilities and meet all relevant regulatory requirements.
- 2.6 Provide periodic oversight of all phases of construction and report progress back to DOI and CSU.
- 2.7 In collaboration with DOI, CSU and the fishway construction contractor, ensure compliance with technical specifications during fishway construction.
- 2.8 Complete the three fish passes per the timelines and budget identified in Articles 5 and 6 of this Project.
- 2.9 In collaboration with DOI and CSU, perform a hydraulic and ecological commissioning to ensure the fishway performs to desired standards.
- 2.10 Coordinate with relevant Ministries to document the final ownership and operations and maintenance plans for the fish passes.

Activity 3: Administration and Coordination

Sub-activity:

- 1.1 Engage a Project Officer to work with points of contact in all partner Ministries and any selected contractors in each nation.
- 1.2 Document project activities in SEAFDEC publications and other media.
- 1.3 Provide computing equipment and consumables as needed to Project Officer.
- 1.4 Provide financial support to the appropriate contractor to construct a model fishway for educational use.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2019

3.1 Activities Achievements in the Year 2019

Project/Activity Title	Duration	Remarks
Activity 1: Coordinate Field Fish Passage Barrier Inventories in Cambodia, Thailand, and Viet Nam. Sub-activity 1.1 Barrier inventory survey, Thailand	17-20 March 2019	
Activity 2: Construct One (1) Demonstration fish pass in Cambodia, One (1) Demonstration fish pass in Thailand, and One (1) Demonstration fish pass in Viet Nam. Sub-activity 2.4 Using final technical specifications, site locations, and funding levels provided by DOI, identify and contract with a qualified contractor in each nation to conduct all site surveys and construction activities. Sub-activity 2.8 Complete the three fish passes per the timelines and budget identified in Articles 5 and 6 of this Project (Cambodia fish passage completed construction)	January, February, April 2019 May 2019	
Activity 3: Administration and Coordination Sub-activity		

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2020

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 2: Construct One (1) Demonstration fish pass in Cambodia, One (1) Demonstration fish pass in Thailand, and One (1) Demonstration fish pass in Viet Nam. Sub-activity 2.4 – 2.10 In collaboration with DOI and Charles Stuart University (CSU), develop appropriate technical specifications that suit the swimming ability of local species and hydrology of the selected sites. Using final technical specifications, site locations, and funding levels provided by DOI, identify and contract with a qualified contractor in each nation to conduct all site surveys and construction activities.	Jan. - May	

Project/Activity Title	Duration	Remarks
<p>Respond to requests from all relevant government agencies with environmental or other permitting responsibilities and meet all relevant regulatory requirements.</p> <p>Provide periodic oversight of all phases of construction and report progress back to DOI and CSU.</p> <p>In collaboration with DOI, CSU and the fishway construction contractor, ensure compliance with technical specifications during fishway construction.</p> <p>Complete the three fish passes per the timelines and budget identified in Articles 5 and 6 of this Project.</p> <p>In collaboration with DOI and CSU, perform a hydraulic and ecological commissioning to ensure the fishway performs to desired standards.</p> <p>Coordinate with relevant Ministries to document the final ownership and operations and maintenance plans for the fish passes.</p>		
<p>Activity 3: Administration and Coordination</p> <p>Engage a Project Officer to work with points of contact in all partner Ministries and any selected contractors in each nation. Document project activities in SEAFDEC publications and other media. Provide computing equipment and consumables as needed to Project Officer. Provide financial support to the appropriate contractor to construct a model fishway for educational use.</p>	Jan. - May	

4.2 Expected Outcomes/Outputs of Activity for the Year 2020

Proposed Activity	Outputs of Activity
<p>Activity 2: Construct One (1) Demonstration fish pass in Cambodia, One (1) Demonstration fish pass in Thailand, and One (1) Demonstration fish pass in Viet Nam.</p>	<p>Complete the three demonstration fish passage construction in Cambodia, Thailand, and Viet Nam.</p>

Annex 8

**PIPELINE PROJECTS AND EMERGING NEEDS FOR
PREPARATION OF FUTURE PROJECT PROPOSALS**

Programs/Projects	Responsible Department	Appendix no.
1. ASEAN-JICA Food Value Chain Development Project	SEC	1
2. ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Countermeasures in Southeast Asia	TD	2
3. Gender Dimension in the Value Chain of Small-scale Fisheries & Aquaculture in Southeast Asia	TD	3
4. Sustainable Management of Fisheries, Marine Living Resource and Their Habitats in Bay of Bengal for the Benefit of	TD	4

PIPELINE PROJECT CONCEPT NOTE

Project Title: ASEAN-JICA Food Value Chain Development Project
Prospect Funding Agency: Japan International Cooperation Agency (JICA)
Lead Department: SEAFDEC Secretariat in cooperation with concerned SEAFDEC Departments
Project Participating Countries: All ASEAN Member States (AMSs)
Proposed Budget: approx. 555,000 USD
Duration: 4 years

1. Background/Introduction

Due to the continuous growth of the ASEAN economy, the middle-class consumers are becoming keen on food safety resulting in strong demand for high value-added products which has been dramatically increasing during the past few decades. On the other hand, in spite of the high growth rate of the middle class consumers, a number of traditional farmers in the region are still living below the poverty line, due to the vulnerability of the food value chain and/or unfair profit distribution in the agriculture sector. The ASEAN recognizes that the establishment of a sound food value chain could be a key solution for ensuring food safety and sustainable development of fisheries in the region, as reflected in various policy documents such as the *Vision and Strategic Plan for ASEAN Cooperation in Food, Agriculture and Forestry (2016-2025)*, *Strategic Plan of Action on Food Security in the ASEAN Region (2015-2020)*, and the *ASEAN Plus Three Leader’s Statement on Food Security Cooperation 2017*.

Since February 2018, the ASEAN Secretariat and JICA have started discussions to formulate the ASEAN-JICA Food Value Chain (FVC) Development Project. In this connection, this Concept Note is developed to describe briefly the future collaborative project between the ASEAN and JICA with respect to the ASEAN food value chain.

2. Goal/Overall Objectives

The main objective of the proposed Project is to improve quality of fish and fishery products and secure export-oriented FVCs in the ASEAN. The framework of the proposed Project is composed of five major thematic areas of cooperation focusing on: i) ASEAN-GAP, 2) SPS measures, 3) fishery value chain, 4) coordination and research on PPP based FVC, and 5) pilot project(s) for FVC in the region (Fig. 1).

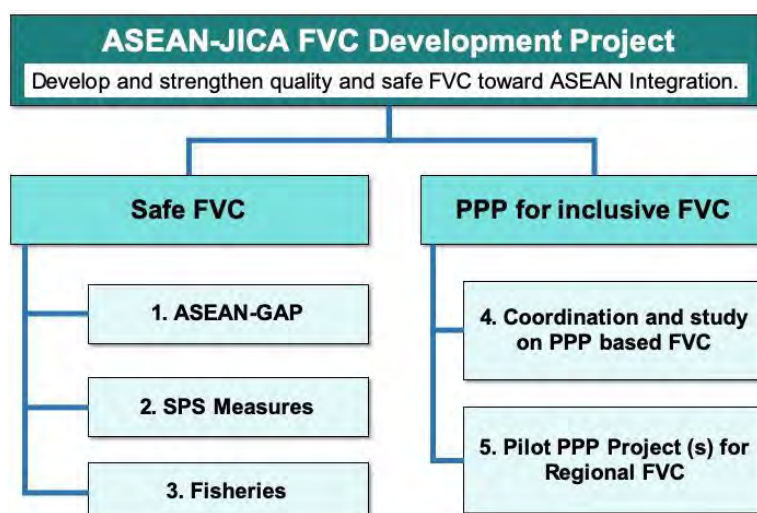


Fig 1. Framework of the proposed ASEAN-JICA FVC Development Project

3. Project Description

The Project on safe FVC in fisheries will consist of three activity pillars as indicated below:

Pillar 1: Assessment of hygiene management system of fishery products (e.g. GAqP), including:

- Capacity building on assessment of fish handling on boats and landing sites (TD),
- GAqP assessment training for extension/focal inspection officers (Marine aquaculture and inland aquaculture) (AQD)

Pillar 2: Promotion of information sharing that would include:

- Workshop for strengthening information network on emergency preparedness countermeasures for transboundary aquatic disease outbreak (AQD)
- Information sharing on implementation of the “Regional Guidelines on Cold Chain Management of Fish and Fishery Products in ASEAN Region” (MFRD)

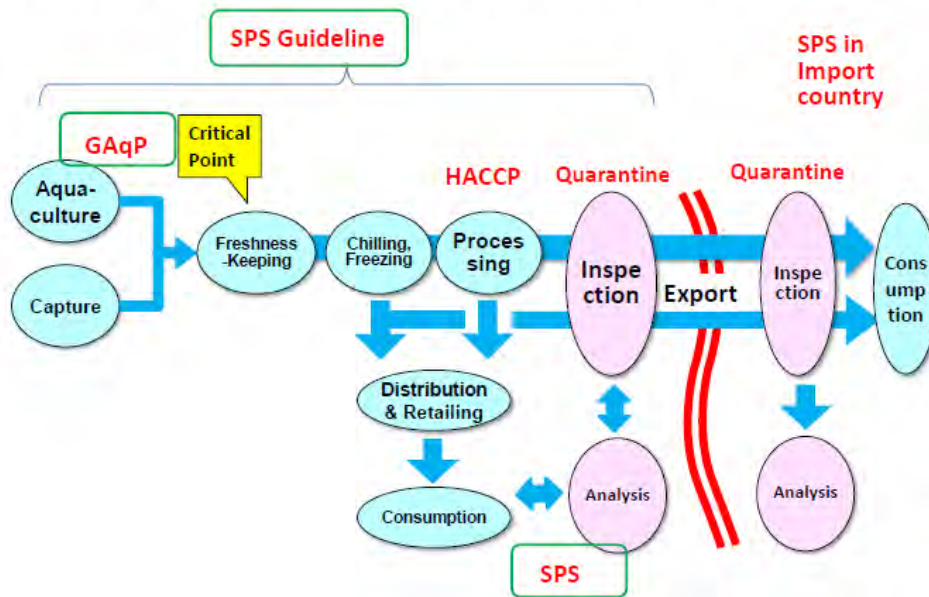
Pillar 3: Preparation of the ASEAN guidelines for inspection of fish and fishery products, including:

- Workshop for development of guidelines for food safety testing for fish and fisheries products (MFRD)
- Workshop for development of ecolabeling strategy in the region (SEC and MFRDMD)

4. Expected Outputs/Outcomes

It is expected that this Project on Safe FVC in fisheries would result in the “Improvement of food safety in the fisheries sector through the promotion of GAqP and development of the ASEAN guidelines and relevant principles on fisheries inspection mechanism,” (indicated as Output 3 and shown below).

Output 3: Food Value Chain in Fisheries



5. Progress and Status

This ASEAN-JICA Food Value Chain Development Project would need approval through the ASEAN and JICA procedures. After their approval, SEAFDEC shall serve as an implementing partner of the Project.

PIPELINE PROJECT CONCEPT NOTE

Project Title: ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Countermeasures in Southeast Asia

Prospect Funding Agency: Japan International Cooperation Agency (JICA)

Lead Department: Training Department (an implementing partner)

Project Participating Countries: All ASEAN Member States (AMSs)

Proposed Budget: approx. 242,000USD

Duration: 4 years

1. Background/Introduction

Fishery is an important socioeconomic activity in coastal developing countries. However, according to the State of World Fisheries and Aquaculture 2016 of the United Nations Food and Agriculture Organization (FAO), more than 15% of the world's fish catch is likely to be associated with illegal, unreported and unregulated (IUU) fishing. IUU fishing has brought not only overexploitation but also hindering the recovery of fish populations and ecosystems in addition to affecting the economic and social well-being of fishing communities, which in turn has been negatively affecting the countries with weak regulatory systems as specified in Sustainable Development Goals (SDGs) 14. Therefore, the need to establish countermeasures to combat IUU fishing has been internationally drawing attention as awareness of the problem has also been increasing, especially when exporting countries have to comply with the international requirements, such as the EC Regulation 1005/2008 since 2010.

Taking into account the significant contribution of fish and fishery products from the Southeast Asian countries to the world markets, the ASEAN Secretariat in cooperation with regional partners led by SEAFDEC has strengthened regional initiatives for facilitating the sharing of experiences and information among the ASEAN Member States (AMSs) in order to enhance the respective countries' capacities and efforts to deal with eliminating IUU fishing and adopting the necessary market driven measures. This has been demonstrated when the AMSs adopted in 2016 the "Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products" which serves as platform for strengthening all efforts in implementing regional initiatives to combat IUU fishing, and promoted the "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain," which had been endorsed by the 37th AMAF in 2015.

2. Goal/Overall Objectives

The AMSs have strengthened their activities to deal with eliminating IUU fishing. However, addressing concerns on IUU fishing is complicated, as these could include various approaches such as promoting responsible fishing practices, avoiding depletion of fish stocks and destruction of marine ecosystem, improving legal frameworks, upgrading systems of monitoring control and surveillance (MCS), and adopting fair labor practices. In particular, promoting capacity building for expert officers who are involved and support the implementation through the cooperation mechanisms at regional level, is required among the AMSs.

This Project therefore aims at enhancing the capacity of AMSs in implementing the IUU fishing countermeasures through a series of training and/or workshop activities. Targeting key government staff and researchers responsible for the implementation of relevant activities in AMSs, this Project is in line with ASEAN common policies that recommend and request for regional cooperation to support capacity building on IUU fishing countermeasures in the ASEAN in collaboration with other partners.

3. Project Description

The Project will consist of three activities as indicated below:

Activity1: Training course on "Responsible fishing technologies/practices to combat IUU fishing in Southeast Asia," to be arranged in Thailand in 2021 and 2022, with the objective of coping with the international issues that need attention

Activity2: “On-site training courses on the ecosystem approach to fisheries management (EAFM) for eliminating the IUU fishing operations in small-scale fisheries in Southeast Asia,” to be organized in Thailand in 2021 and 2022, to enhance the capacity of fishery management officers on the EAFM concept

Activity3: “Regional capacity building workshop on enhancing policies and countermeasures against IUU fishing in Southeast Asia,” to be held in Thailand in 2020 and 2023, with the objective of harmonizing the implementation of policies related to IUU fishing countermeasures and enhancing the capacity of senior officers in charge of international-related issues and IUU fishing countermeasures through information sharing among the AMSs

4. Expected Outputs/Outcomes

Bearing in mind that IUU fishing is a serious concern and threatens the sustainability of the region’s fisheries management measures, fisheries resources and aquatic ecosystems, food security and so on, this Project makes sure that the participants from AMSs improve their understanding of the practices and actions necessary to deter IUU fishing and to think about the tangible countermeasures that could be adopted in their own countries, as well as strengthening concrete countermeasures based on specific issues and concerns for eliminating IUU fishing in the AMSs

- Direct/immediate beneficiaries are government officers (researchers) from the AMSs, especially those attending the trainings/workshops
- Indirect beneficiaries are the AMSs and the other countries as well as fishers, other stakeholders and the consumers in general

5. Progress and Status

This ASEAN-JICA Cooperation for Capacity Building on IUU Fishing Countermeasures in Southeast Asia would need approval through the ASEAN and JICA procedures. After their approval, SEAFDEC shall serve as an implementing partner of the Project. Therefore, depending on the progress of their procedures, the implementation schedule of project activities would be determined.

PIPELINE PROJECT CONCEPT NOTE

Project Title: Gender Dimension in the Value Chain of Small-scale Fisheries and Aquaculture in Southeast Asia

Prospect Funding Agency: The Food and Agriculture Organization of the United Nations (FAO)

Lead Department: SEAFDEC Training Department

Proposed Budget: 100,000

Duration: January 2020 to June 2021 (18 months)

1. Background/Introduction

Generally in the Southeast Asian societies, women's roles in fisheries are not well recognized, and are usually overlooked or under-represented in official documents and statistics. Documentation of women's contributions to the fisheries (*e.g.* value chain in small-scale fisheries and aquaculture) has remained to be a challenge because of their informal nature of work. Thus, the SSF Guidelines recommend that gender mainstreaming should be an integral part of all small-scale fisheries development strategies, considering that the different cultural contexts and challenging practices are discriminatory against women. A "Practical Guide for Gender Analysis in Small-scale Fisheries and Aquaculture in Southeast Asia (Practical Guide)" has been developed by SEAFDEC to implement the "SEAFDEC Gender Strategy on Integrating Gender in SEAFDEC Programs and Projects" where gender perspectives should be considered throughout the cycle of fisheries management or the development of projects and programs. Therefore, the Practical Guide will be introduced as a baseline for fisheries management and project planning for better understanding of the status of women and men in small-scale fisheries and aquaculture value chain, further decision making and structural challenges preventing equitable opportunities for women and men. Funding for this project that focuses on data collection has been sought from the Food and Agriculture Organization of the United Nations (FAO).

2. Goal/Overall Objectives

To improve and strengthen gender dimension in selected small-scale fisheries and aquaculture values chain in Southeast Asia

3. Expected Outputs/Outcomes

- 1) Report on gender dimension in the small-scale fisheries value chain that can be used as a basis for field intervention
- 2) Communication product conveying the good practices

4. Project Description

January to April 2020 (within 4 months)	Site trainings for enumerators on gender concept and analysis and development of a data collection protocol
May to August 2020 (for 4 months)	Data collections and analysis for 4 countries
September to December 2020 (within 4 months)	4 Data validation workshops
January to June 2021 (6 months)	Preparation of report on gender analysis, regional workshop and communication product

Required consideration by the 42nd PCM

The 42nd PCM is requested to take note of the concept project proposal on Gender Dimension in the Value Chain of Small-scale Fisheries and Aquaculture in Southeast Asia, and provide suggestions on the workplan/activities to be included as part of project.

PIPELINE PROJECT CONCEPT NOTE

Project Title: Sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region for the benefit of coastal states and communities: Support to SEAFDEC Member Countries

Prospect Funding Agency: FAO/GEF

Lead Department: Training Department

Proposed Budget: 2,000,000 - 3,000,000 USD for SEAFDEC Member Countries (to be finalized after detailed project planning)

Duration: 5 years with a tentative start date of June 2020

1. Background/Introduction:

The Bay of Bengal Large Marine Ecosystem (BOBLME) is an ~USD10 Million investment by the Global Environment Facility (GEF) to implement fisheries and critical habitats actions identified in the Bay of Bengal Strategic Action Programme that was endorsed by the 8 BOB coastal countries in 2015. SEAFDEC has been invited to become a project partner to implement actions for its Member Countries (*i.e.* Myanmar, Thailand, Malaysia and Indonesia). The budget for this implementation will be USD2 Million with a possible increase in budget associated with a mid-term review of activities. A description of the project is provided in Annex 1.

Opportunities:

SEAFDEC will facilitate the implementation of actions that address:

1. Sustainable Management of Fisheries

SEAFDEC will develop regional capacities and provide technical advice for the management planning for Indo-Pacific Mackerel, Anchovy and advice for Neritic Tuna. This will include EAFM plans, developing co-management arrangements, combatting IUU and providing training in EAFM and MCS.

2. Restoration and conservation of critical marine habitats and conservation of biodiversity

SEAFDEC will assist with its experience in marine spatial planning and its role in benefiting fisheries stock management. This will include incorporation of restoration of critical marine habitats in EAFM plans.

3. Improved Livelihoods and enhanced resilience of the BOBLME

SEAFDEC will assist in the implementation of the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF-Guidelines), as well as the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security.

4. Regional mechanisms for planning, coordination and monitoring of the BOBLME

SEAFDEC will support a BOBLME wide monitoring and coordination systems, in particular existing sub-regional mechanisms (such as MCS networks).

2. Expected Outputs/Outcomes

- Implementation of EAFM plans for targeted transboundary fish stocks (*e.g.* Hilsa, Indo-Pacific Mackerel, Anchovy).
- Reduced potential for IUU catch and continuance of established MCS networks.
- Enhanced resilience and reduced vulnerability of marine systems to natural and climate hazards.
- Strengthened institutional mechanisms at regional and national levels for planning, coordination and monitoring of fisheries and ocean ecosystems.

3. Project description

The project documentation for approval by the GEF will be submitted in December 2019 with a tentative project commencement scheduled for June 2020. Year 1 of the project will be dedicated to the project inception to allow for detailed country level planning of activities.

Bay of Bengal LME

Project Title: Sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region for the benefit of coastal states and communities: Support to SEAFDEC Member Countries

Prospect Funding Agency: FAO/GEF

Lead Department: Training Department

Proposed Budget: 2,000,000 - 3,000,000 USD for SEAFDEC Member Countries (to be finalized after detailed project planning)

Duration: 5 years with a tentative start date of June 2020

1. Background/Introduction

The Bay of Bengal Large Marine Ecosystem (BOBLME) is one of the largest LMEs globally and covers 6.2 million km² with depths ranging between 2 000 and over 4 000 m for most of its central area. The continental shelf around its perimeter is mostly narrow. About 66 percent of the BOBLME lies within the exclusive economic zone's (EEZ) of BOBLME countries - Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand, and the remainder being the high seas area. The BOBLME is rich in natural resources, including extensive mineral and energy resources; marine living resources that support major fisheries; and forest and land resources. The LME is the site of three important critical habitats - mangroves (12 percent of world mangrove resources); coral reefs (8 percent of the world's coral reefs) and seagrass. The BOBLME is an area of high biodiversity, with a large number of endangered and vulnerable species. The LME and its natural resources are of considerable social and economic importance to the bordering countries, with activities such as fishing, aquaculture, tourism and shipping contributing to food security, employment and national economies.

The first phase of the BOBLME project supported participating countries in the development and agreement of a Transboundary Diagnostic Analysis (TDA) and Strategic Action Plan (SAP). The TDA identified three priority transboundary concerns, including their more proximate causes: overexploitation of marine living resources, degradation of critical habitats and pollution and water quality. SEAFDEC was a strong partner during the first phase of the BOBLME in particular supporting its Member Countries through technical advice and capacity building for EAFM and combatting IUU.

A program framework document (PFD) was developed by FAO and ADB to address the priority issues identified by countries in the SAP. The PFD was endorsed by all BOBLME countries and by the GEF in May 2018.

This PFD includes the FAO project entitled "*Sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region for the benefit of coastal states and communities*". The project is in the design phase with submission to the GEF planned for November 2019.

FAO has initiated dialogue with SEAFDEC and also Bay of Bengal Program-Intergovernmental Organization (BOBP-IGO) and IUCN to develop partnership agreements for a substantial part of implementation.

For SEAFDEC the areas of focus will be with areas of its mandate and for its shared BOBLME/SEAFDEC countries.

2. Goal/overall Objectives

The project objective is (for SEAFDEC countries) "*To contribute to sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region for the benefit of coastal states and communities*".

3. Project Description

The project objective is to support sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region, to reduce environmental stress and improve environmental status for the benefit of coastal states and communities.

This will be achieved through five interlinked Project components based on the BOBLME SAP themes, and with an added component to strengthen the institutional arrangements for regional partnerships coordination and collaboration, ecosystem-based monitoring and assessment. The GEF support to the implementation of the SAP

is expected to leverage significant amounts of investments from the BOBLME countries, from both national and sub-national levels, multilateral and bilateral development partners.

SEAFDEC will be a sub regional implementation hub for the project.

National implementation in countries requesting this will be through a “Seascope Focus Area Approach” to ensure efficient and coordinated implementation. This approach will deliver all components in one area and ensure linking through regional action planning to national implementation at Fishery/community level.

The project includes the following tentative proposals which have emerged from consultations in SEAFDEC-BOBLME Member Countries (Myanmar, Thailand, Malaysia and Indonesia). These will be confirmed during the inception work planning. The project will work through multi Four countries in which Focus Areas or sub national activities are to be implemented. Advisory and coordination committees will be formed at an appropriate level and supported by local experts to advise on implementation of the project. Wherever possible the project will work through and strengthen existing mechanisms.

Component 1: Sustainable Management of Fisheries

The sustainability of fisheries and livelihoods in the BOBLME depends to a large extent on marine living resources. Illegal, Unreported and Unregulated (IUU) fishing has been shown to contribute to the overexploitation of fish stocks in the BOBLME and is a clear hindrance to the management and recovery of fish populations and ecosystems that are already overexploited. A systematic application of the ecosystem approaches to fisheries management (EAFM) and the reduction of threats from IUU fishing, as well as application of participatory and inclusive approaches is therefore essential for the improvement of ecosystem health and livelihoods in the BOBLME. This component thus has two major outcomes:

Outcome 1.1: The ecosystem approach to fisheries management institutionalized at national level

Regional level: Regional capacity development, technical advice and fisheries management planning for Indian Mackerel, Anchovy and advice for Neritic Tuna (in collaboration with IOTC).

National level

- Output 1.1.1 At least, 2 EAFM plans implemented in each SEAFDEC country.
 - Species and fisheries include Indian Mackerel, Anchovy and Neritic Tuna. EAFM plans to be developed and implemented.
 - Hilsha (national and regional) for Myanmar.
 - Planning at Andaman Sea and Sub regional level and National level.
 - For Indonesia FMP areas 571 and 572
- Output 1.1.2. National and regional platforms established or strengthened to involve grassroots stakeholders in management decision-making:
 - Development of multi-stakeholder management groups to contribute to EAFM implementation.
 - Promotion of Co-Management and strengthening the operationalization of management bodies in FMA 571 and 572
- Output 1.1.3 EAFM training embedded in national and regional training institutions
 - Capacity building for training partners in countries where this is still required
 - Support to strengthening EAFM capacity development in countries where EAFM already under implementation.
 - EAFM Training (Training of Trainer, Training for planners, training for implementers, Training for evaluators)
 - Development of EAFM Plans: For Indonesia review FMP for area 571 and 572 (can include the latest issues and or commodities that are of regional); strengthening fisheries and conservation area data
 - Promotion of Co-Management and strengthening the operationalization of management bodies in FMA 571 dan 572

Outcome 1.2: IUU catch in the BOBLME reduced:

- Output 1.2.1 BOBLME countries join and implement a Regional Plan of Action (RPOA) on IUU fishing
 - BOBLME working group to develop roadmap for BOBLME RPOA-IUU. Strengthening of RPOA-IUU and sub-regional mechanisms

- Output 1.2.2. National POAs-IUU and national IUU MCS systems and Vessel Monitoring System (VMS) strengthened
 - Indonesia has NPOA-IUU.
 - Lessons shared between SEAFDEC countries on MCS and VMS.
- Output 1.2.3 Tools for promoting best practices, such as MCS, PSM and traceability, and policies and national actions to combat IUU fishing developed and implemented in national pilot/investment projects
 - Strengthening of Andaman MCS network
 - Indonesia has NPOA-IUU and endorsed PSMA.
- Output 1.2.4. Regional Capacity Development Program on port inspections, MCS and traceability implemented
 - Capacity needs assessment
 - Capacity development plan
 - Training on MCS, Port Inspections

Component 2: Restoration and conservation of critical marine habitats and conservation of biodiversity

This component will lead to improved management and status of degraded, vulnerable and critical coastal and marine habitats and Endangered, Threatened and Protected (ETP) species in the BOBLME by integrating marine spatial management tools, such as Marine Protected Areas (MPAs), and Vulnerable Ecosystems (VEs) into fisheries and biodiversity conservation management of critical habitats in SEAFDEC country region of the Andaman Sea (Myeik Archipelago).

Broadly this component will be implemented by IUCN at regional and national level in collaboration with the responsible ministries (including Environment) and national partners. At national level MPA's related work will be implemented through Focus Areas.

SEAFDEC's role will be to provide technical advice to SEAFDEC/BOBLME countries in areas where fisheries technical advice is needed in relation to conservation and planning.

Component 3: Management of coastal and marine pollution to improve ecosystem health

The health of the BOBLME is threatened by wastewater and solid waste from upriver and coastal cities and settlements, industrial zones, ports and shipping, and excessive nutrient application in agriculture and high nutrient loads in rivers and water courses.

The project aims to change attitudes and approaches so that wastewater and solid waste. Marine and coastal resources represent important natural capital assets, but increasingly are subject to negative impacts of upstream activities on land and along river systems. In this connection, the project will take steps to increase understanding of the complexities of source-to-sea management continuum - where ecosystems are degraded as an unintended consequence of economic activities that might happen far upstream or downstream in the source-to-sea system. The project aims to reduce pollution from discharge of untreated sewage and wastewater; solid waste and marine litter; and nutrient loading reduced or minimized in selected hotspots in river, coastal and marine waters; promotion of cleaner fishing ports and addressing abandoned fishing gears at 8 hotspots applying ICM approaches. It is expected that there will be an increase in fishing ports covered by sewage management systems and improved waste management, and that nutrient loading is significantly reduced at coastal and marine hotspots.

This component will be implemented by the ADB in Mandalay city.

At this stage there are no GEF funds available for other areas of implementation.

Component 4: Improved livelihoods and enhanced resilience of the BOBLME

This component will lead to positive changes in the overall well-being of coastal people and their involvement in both fisheries management and biodiversity conservation, which is expected to lead to both enhanced ecosystem resilience of the BOBLME and of local livelihoods and food security. Vulnerability to natural hazards, and climate variability and change will be reduced and livelihoods diversified for selected coastal communities, with equal opportunities for women, men and youth. This component will also constitute a platform to support implementation of key concerns of the FAO Voluntary Guidelines for Securing Sustainable

Small-Scale Fisheries in the Context of Food Security and Poverty Eradication SSF-Guidelines (VG-SSF), as well as the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VG-Tenure). ADB will contribute to this component through the regional training programme under 3.2 above on waste and waste water management with identification of investment opportunities that will contribute to improved well-being of coastal communities.

Where this component is implemented at national level it will link through the Focus Areas integrating with fisheries management planning and MPA strengthening.

Outcome 4.1. Enhanced resilience and reduced vulnerability to natural hazards, climate variability and change of selected coastal communities:

- Output 4.1.1 Resilience plans developed based on valuation of ecosystem services.
- Output 4.1.2 Inclusion of coastal fisheries and aquaculture in poverty reduction and development, as well as climate change policies, strategies and planning processes promoted
- Output 4.1.3. Gender considerations mainstreamed into relevant policy and regulatory frameworks

Outcome 4.2. Enhanced sustainable livelihoods and diversification for selected coastal communities:

- Output 4.2.1 Livelihood diversification for women piloted (in at least one site per country)
 - Sites to be selected in Indonesia, Malaysia, Myanmar and Thailand,
- Output 4.2.2. Access to innovative financial services and insurance mechanisms improved
- Output 4.2.3. Regional capacity development programme for selected coastal communities on alternative livelihoods, promoting decent work, social protection for empowerment.

SEAFDEC's role in this component will be to provide technical advice to SEAFDEC Member Countries where fisheries technical advice is needed. The project will support implementation of the VGSSF.

Component 5: Regional mechanism for planning, coordination and monitoring of the BOBLME

The ability to implement ecosystem management at the regional level in the BOBLME depends on the capacity to undertake monitoring of the whole ecosystem and to plan and coordinate management activities at regional level. This can only be achieved through strengthened regional cooperation between countries and between government agencies within countries and the engagement of civil society and the private sector. The Programme will therefore focus on achieving the following outcomes under this component:

Outcome 5.1. Strengthened institutional mechanisms at regional and national levels for planning, coordination, and monitoring of the BOBLME

Output 5.1.1 CCR-BOBLME established to promote stakeholder participation and awareness, ecosystem assessment, and application of best practices in implementation of the SAP

- 5.1.2 Long-term partnership arrangements agreed for sustainable regional coordination mechanism and sustainable financing for ecosystem-based management in the BOBLME
- 5.1.3 National inter-sectoral coordination committees to support SAP implementation established.
- 5.1.4 Stakeholder consultation mechanism established for engagement of civil society, cooperatives, and the private sector
- 5.1.5 Baseline data collection and analysis systems developed for monitoring systems and sharing information.

Outcome 5.2. Adaptive results-based management and sharing of information and lessons learned

- Output 5.2.1 Communication Strategy developed and implemented
 - SEAFDEC will support the development of a
- Outcome 5.2.2. Programme findings and lessons learned identified and contribute to IWLearn and LME Learn
- Output 5.2.3. Regional information sharing mechanism developed enabling broad access to best practices and lessons learned in the participating countries
- Output 5.2.4. Monitoring system operating and providing systematic and regular information updates on progress towards reaching BOBLME SAP targets

SEAFDEC's role in this component will be to support project efforts to develop a BOBLME wide monitoring and coordination systems, building on existing sub regional mechanisms (such as SEAFDEC MCS networks, IUU reporting mechanisms).

4. Expected Outputs/Outcomes

Describe the expected complete results or finished products at the end of project.

The key project Outputs include (in SEAFDEC/BOBLME countries)

- The ecosystem approach to fisheries management (EAFM) institutionalized at national level for targeted transboundary fish stocks (*e.g.* Hilsa, Indian Mackerel, Anchovy)
- IUU catch in the BOBLME reduced
- Coastal and marine managed areas (MMAs) contribute to conservation of biodiversity and blue carbon
- National MMAs established or strengthened resulting in improved MMA management effectiveness at national level (with STAR funding; without STAR funding, mainly bilateral donor funding to be used; CCM funding for Bangladesh will be used for the Sundarbans (Reserve) Forest)
- Regional consensus and agreements on reduction of threats to marine biodiversity in coastal and open waters
- Pollution from discharge of untreated sewage and wastewater; solid waste and marine litter; and nutrient loading reduced or minimized in selected hotspots in river, coastal and marine waters; promotion of cleaner fishing ports and addressing abandoned fishing gears at 8 hotspots applying ICM approaches
- Enhanced resilience of the BOBLME and reduced vulnerability to natural hazards, climate variability and change of selected coastal communities
- Enhanced sustainable livelihoods and diversification for selected coastal communities
- Strengthened institutional mechanisms at regional and national levels for planning, coordination and monitoring of the BOBLME
- Adaptive results-based management and sharing of information and lessons learned

5. Progress and Status

The BOBLME project document design is underway with submission to the GEF planned for November 2019.

- Regional consultations completed include PPG Inception Workshop (12-13 March 2019) and the PPG PSC meeting (14 March)
- National Consultations completed in Thailand, Myanmar, Sri Lanka, Maldives, Bangladesh (supported by IUCN), Indonesia, India (State and Federal supported by FAO) and Malaysia (supported by DOFM)

Next steps will include developing a Partnership agreement and workplan with SEAFDEC

Implementation is forecast to start in June 2020.

PIPELINE PROJECT CONCEPT NOTE

Project Title: Piloting the electronic ASEAN Catch Documentation Scheme (eACDS) in Viet Nam

Prospect Funding Agency: World Bank

Lead Department: Training Department

Proposed Budget: approx. 50,000 USD

Duration: 1 year (2020)

1. Background/Introduction

Following to the successful outcomes of the first investment project for Viet Nam's fisheries sector by the World Bank (WB) "Coastal Resources for Sustainable Development Project (CRSD)", the WB is in the process of preparing a new fisheries investment project titled, "Sustainable Fishery Development Project (SFDP)." While an electronic catch documentation system (VNFishbase) was introduced to the project provinces under CRSD, Viet Nam's catch documentation and traceability systems currently in place need further strengthening. To this end, the WB team is planning to 1) conduct a study to look at how VNFishbase and eACDS can complement each other to enhance the traceability of fishery products; and 2) support pilot application of eACDS in Binh Thuan Province and/or another project province under SFDP.

2. Goal/overall Objectives

eACDS successfully piloted in Binh Thuan Province and/or another SFDP project province and the lessons learned from the pilot shared with other project provinces and nationwide

3. Project Description

SEAFDEC has introduced and conducted the implementation of eACDS in Viet Nam since 2018. Pilot sites are in Binh Thuan Province, 300 km south of Nha Trang City or 300 km northeast of Ho Chi Minh City. There are 50 vessels from 4 fishing ports participated in the project. Training/capacity-building were conducted for all stakeholders (administrative officials, fishing masters, vessel owners, port officers, buyers, processors and those of the manager level) to provide them with understanding on eACDS and to introduce as pilot project in cooperation with Directorate of Fisheries (D-Fish), Viet Nam by SEAFDEC. This Pipeline Project would future support eACDS piloting and training stakeholders in Viet Nam through the following activities;

- 1) Training on the use of eACDS for stakeholders, including officials from D-Fish, the provincial Department of Agriculture and Rural Development (DARD) and selected fishers; and
- 2) Testing & trial of eACDS implementation in pilot sites in Binh Thuan Province and/or another project province including adoption of off-line technology for the positioning of fishing operations and vessel tracking.

4. Expected Outputs/Outcomes

- Stakeholders including D-Fish and DARD officials and fishers from Binh Thuan Province and/or another selected province trained on the use of eACDS
- Systematic and continuous data collection through eACDS conducted at the pilot sites

5. Progress and Status

The Pipeline Project is subject to approval by the World Bank and SEAFDEC prior to contract signing.

STATEMENT

*By Ms. Susana Siar
FAO/Regional Office for Asia and Pacific (FAO/RAP)*

Madame Chair, distinguished delegates, esteemed colleagues,

We thank SEAFDEC for inviting us to this meeting and giving us the opportunity to deliver a statement on areas of collaboration and mutual interest. On behalf of my colleagues at the Fishery team of the FAO Regional Office for Asia and the Pacific, I would like to congratulate SEAFDEC for having the first female Secretary-General, which is a huge milestone after 50 years of existence.

The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger. Our goal is to achieve food security for all and make sure that people have regular access to enough high-quality food to lead active, healthy lives. With over 194 member states, FAO works in over 130 countries worldwide. We believe that everyone can play a part in ending hunger.

Fish is an important part of the diet in Asia, where the per capita food fish consumption in 2015 was at 24 kg/year, higher than that of the world, which was 20.2 kg. In 2016, the global population engaged in the primary sectors of fisheries and aquaculture was estimated at 59.6 million, with 85 percent of them in Asia. Of 19.3 million people in the world engaged in aquaculture, 96 percent were in Asia. If we consider that for every person directly engaged in fisheries and aquaculture, three to four others are engaged in secondary activities such as processing, marketing, packaging and distribution, there are an estimated 152-203 million people engaged in fisheries and aquaculture in Asia. Globally, it is estimated that women constitute 14 percent of all people directly engaged in fisheries and aquaculture, equivalent to 7.1 million in Asia. A further 21.3-28.3 million women in Asia may be engaged in secondary activities. Owing to a lack of sex-disaggregated statistics, these figures may be under-estimated.

FAO works with Member Countries, regional and international organizations, civil society organizations, research and academic institutions, and the private sector to achieve a world without hunger.

In the Asian region, we value and appreciate the long-standing collaboration and coordination with SEAFDEC and its Member Countries towards sustainable fisheries and aquaculture and the achievement of the Sustainable Development Goals, particularly, SDG 14, Life below water. We congratulate SEAFDEC on its many achievements and would like to highlight some of the existing and future areas of collaboration, namely:

Implementation of the Code of Conduct for Responsible Fisheries, the International Plans of Action (among others, on Fishing Capacity, Sharks, IUU fishing) and the voluntary guidelines supporting responsible fisheries.

Capacity development on and implementation of the ecosystem approach to fisheries: It is very encouraging to witness the uptake of the ecosystem approach to fisheries management (EAFM) by SEAFDEC Member Countries and the development and implementation of EAFM plans at local, national and transboundary scale. Our goal should be to make EAFM the norm rather than the exception because the resilience of our fishing communities would depend, among others, on well-managed fisheries.

Implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines): We congratulate SEAFDEC on the policy brief on human rights based approach and the Gender Strategy and look forward to future reports on their implementation in Member Countries.

Addressing illegal, unreported, and unregulated (IUU) fishing and the implementation of the Port State Measures Agreement. With technical support from our colleagues in Rome, FAO has undertaken, or is in the process of undertaking PSMA and related international instruments gap analysis, and legal framework analysis in some SEAFDEC Member Countries, and stands ready to provide technical support in the preparation to accede to PSMA as well as in capacity development in the implementation of PSMA.

FAO appreciates the efforts being undertaken by SEAFDEC in strengthening regional cooperation to combat IUU fishing and in working towards making the region free of IUU fishing.

Madame Chair, distinguished delegates, esteemed colleagues,

FAO/RAP is looking forward to having SEAFDEC as one of the execution partners of the GEF-funded project, Sustainable management of fisheries, marine living resources and their habitats in the Bay of Bengal region for the benefit of coastal states and communities (BOBLME 2). The Bay of Bengal LME is approximately USD 10 million investments by the Global Environment Facility to implement fisheries and critical habitat actions identified in the Bay of Bengal Strategic Action Programme that was endorsed by the eight Bay of Bengal countries in 2015. These eight countries are Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka, and Thailand. SEAFDEC has been invited to become a project partner to implement actions for Indonesia, Malaysia, Myanmar and Thailand. These actions include those that address sustainable management of fisheries, restoration and conservation of critical habitats and conservation of biodiversity, improved livelihoods and enhanced resilience of the Bay of Bengal large marine ecosystem, and regional mechanisms for planning, coordination and monitoring of the Bay of Bengal LME.

SEAFDEC is also a project partner in a new project for submission to the Global Environment Facility called GotFish: Promoting the Blue Economy of the Gulf of Thailand through the Ecosystem Approach to Fisheries. The project has three components, namely:

Component 1: Regional fisheries governance and management

Outcome 1.1: Strengthened regional governance of fisheries in the Gulf of Thailand

Outcome 1.2: Enhanced capacity of fisheries stakeholders to implement ecosystem approach to fisheries management in the Gulf of Thailand

Component 2: Alignment of incentive mechanisms

Outcome 2.1: Incentive mechanisms supporting the transition to sustainable climate-resilient fisheries

Component 3: Stakeholder engagement, communication, monitoring and evaluation

Outcome 3.1: Efficient knowledge management and targeted communication

Component 4: Ecological corridor of critical and important habitat for aquatic resources in the East Coast of Peninsular Malaysia

Outcome 4.1: Strengthened national and transboundary protection management of critical and important habitats for biodiversity conservation and management of key fish stocks in East Coast Peninsular Malaysia

Outcome 4.2: Enhanced resilience of ecosystem and coastal communities in East Coast of Peninsular Malaysia through the establishment and strengthening of fisheries replenishment zones and other conservation areas following the ecosystem approach, and supporting blue sector livelihoods

These two projects build on the achievements and seeds planted by existing projects and carry forward the good practices and lessons learned from, among others, the SEAFDEC-Sweden project, the implementation of EAFM and the SSF Guidelines.

Madame Chair, distinguished delegates, esteemed colleagues,

We thank SEAFDEC for the continued collaboration and reaffirm our commitment to strengthen this collaboration in the coming years.

Thank you.

STATEMENT

By Mr. Kota Sakaguchi
The Japan International Cooperation Agency (JICA)

November 12, 2019

ASEAN-JICA Cooperation Project for Food Value Chain Development and IUU Fishing countermeasures

Kota Sakaguchi
Director, Team 1 (ASEAN Region)
Rural Development Dept.
Japan International Cooperation Agency

Portfolio of Bilateral Cooperation											
JICA's Cooperation in Agriculture, Livestock and Fishery Sector with AMSS											
	Brunei	Cambodia	Indonesia	Laos	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam	Total
TCP		5	7	2	1	7	1		5	4	32
TCP		4	4	2	0	6	1		2	2	21
SATREPS		1	3	0	1	1	0		3	2	11
Advisor		1	1	1	0	2	1		2	1	9
Financial											
Cooperation		1	1	1	0	6	1		0	5	15
Loan		1	0	0	0	3	1		0	2	7
Investment		0	0	0	0	0	0		0	1	1
Study for Loan		0	0	0	0	1	0		0	1	2
Grant		0	1	1	0	2	0		0	1	5
Partnership											
Incl. PPP		6	11	0	1	8	6		3	7	42
PPP Survey		3	6	4	0	7	4		3	6	30
Partnership Project		3	0	7	0	1	1		2	0	12
Scholarship		0	0	0	0	0	0		0	0	0

Background

- Due to the constant growth of the ASEAN economy, the middle class consumers who tend to be keen for food safety and also have strong demand for high value added products are dramatically increasing in these few decades. On the other hand, in spite of the high growth rate of the middle class, a number of traditional farmers in the region are still left below the poverty line, due to the vulnerable food value chain and/or unfair profit distribution in the agriculture sector.
- ASEAN recognizes that establishment of a sound food value chain can be a key solution for ensuring the food safety and sustainable development and also commits itself to strengthening the food value chain as shown in various policy documents such as the "Vision and Strategic Plan for ASEAN Cooperation in Food, Agriculture and Forestry(2016-2025)", the "Strategic Plan of Action on Food Security in the ASEAN Region 2015-2020" and the "ASEAN Plus Three Leader's Statement on Food Security Cooperation 2017"
- In February 2018, ASEC and JICA have started a joint effort to formulate the ASEAN-JICA Food Value Chain Development Program and as a result of that effort, this concept note is prepared in order to describe briefly a future cooperation project between ASEAN and JICA in the ASEAN food value chain.

Background

- JICA's Activities related to Food Value Chain in ASEAN
 - JICA has been extending Bilateral Cooperation in FVC and regional connectivity.
 - JICA is exploring possibility of ASEAN-JICA regional cooperation with ASEAN

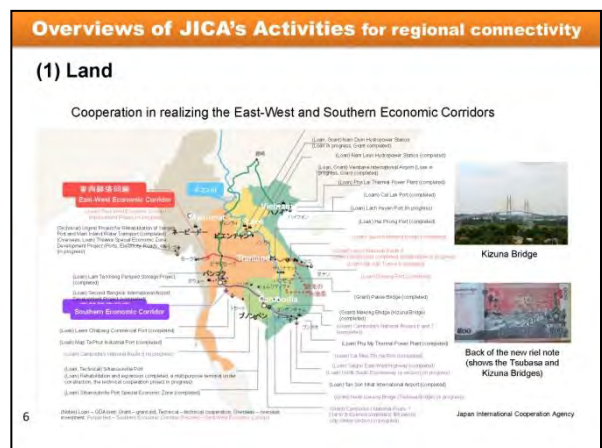
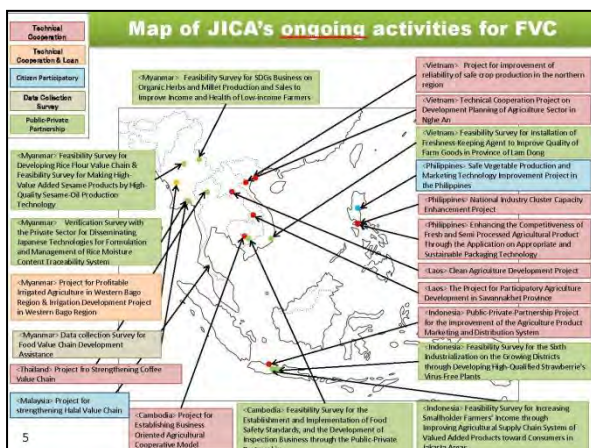
Regional cooperation with ASEAN

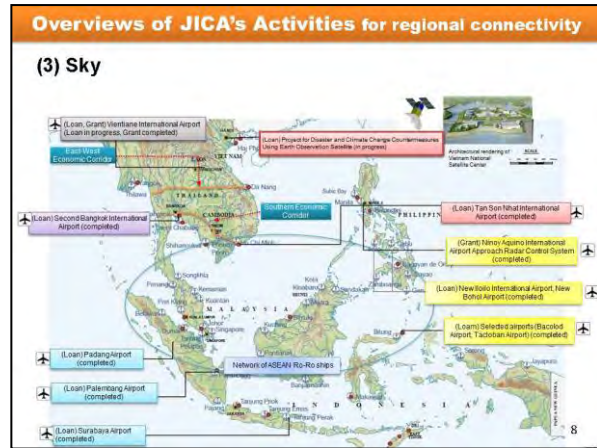
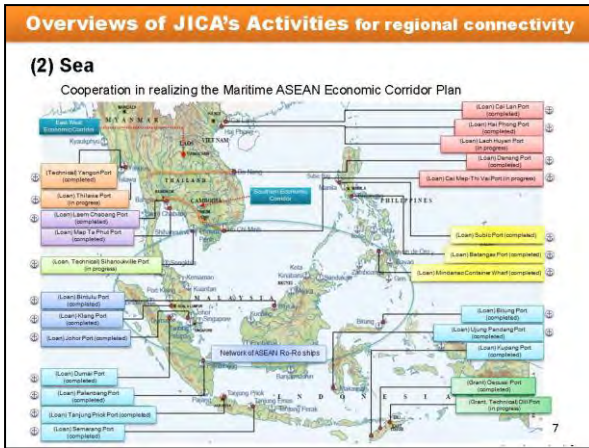
Bilateral Cooperation for FVC

Bilateral Cooperation for regional connectivity, contributing to FVC

NEW!

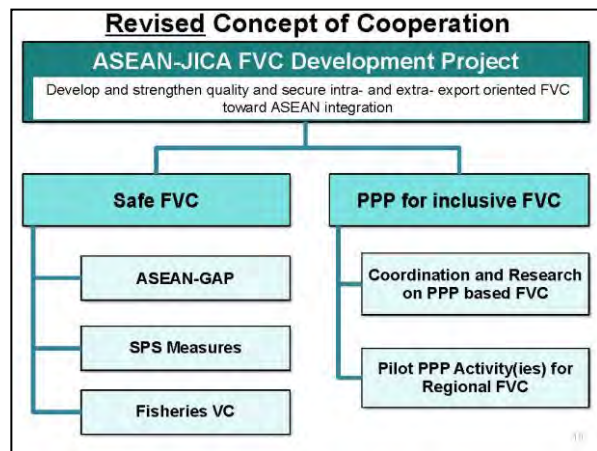
- Regional Technical Cooperation with ASEAN for FVC development
⇒ for AMSS' common needs
- Technical Cooperation and Grant Aid for production, processing, distribution and marketing
- ODA Loan for Irrigation scheme & Credit system etc.
⇒ for supporting national policy
- ODA Loan for Physical Infrastructure
- Capacity Development
⇒ for supporting national policy





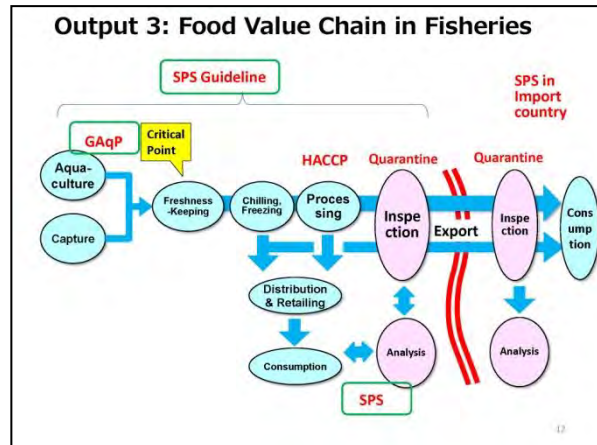
ASEAN-JICA Cooperation Project for Food Value Chain Development - Objective and Expected Outputs -

Japan International Cooperation Agency



Preliminary idea of the Project Component

Objective/ Output
Output 1: Action Plan for marketing and promotion of ASEAN-GAP is developed.
Output 2: Capacities of SPS analysis are strengthened.
Output 2.1: Analytical ability of pesticide analysis is strengthened.
Output 2.2: Pest identification and diagnosis methods are levelled.
Output 3: Food safety of fishery sector is improved.
Output 4: Capacities of PPP for FVC are strengthened.
Output 5: PPP based inclusive FVC model(s) is identified.



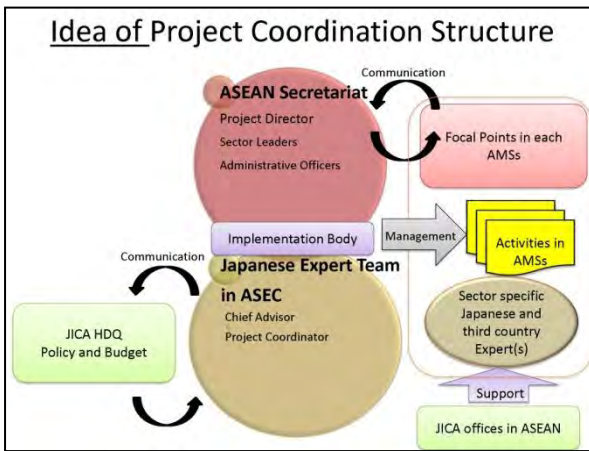
Output 3: Food Value Chain in Fisheries

- Pillar 1** • **Assessment of hygiene management system** of fishery products(incl. GAqP)
- Pillar 2** • Promotion of **information sharing**
- Pillar 3** • Prepare **ASEAN guideline for inspection of fish and fisheries products**

➢ Activities are planned to be conducted through collaboration with **SEAFDEC**

Output 4 : PPP for Inclusive FVC: Pillars

- Pillar 1** • **Research and case study** on PPP based FVC in AMSs
- Pillar 2** • **Policy recommendation** on promoting PPP based FVC in AMSs



Milestones, Next Steps and Events

Timeline	Event	ASEAN-JICA Cooperation
May 2019	■ Technical Cooperation Agreement between ASEAN and Japan	
July 2019		- Submission of Progress Report of Data Collection Survey - Revise Concept Note as Concept note 2.0
Aug 2019	■ SOM-AMAF +3	
Oct-Nov. 2019	■ AMAF +3	- ASEAN FVC Focal Point meeting ('if necessary') - Submission of Project Proposal
Nov. 2018	■ ASEAN-Japan Summit Meeting (planned)	
2020-		- Approval of the Project Proposal by both ASEAN and Japan - (Dispatch Detail Design study team) - (Record of Discussions for ASEAN-JICA Cooperation) - Start Project

ASEAN-JICA Cooperation Project for IUU Fishing countermeasures - Objective and Expected Outputs -

Japan International Cooperation Agency

SDG14 & JICA's Priority

14 LIFE BELOW WATER

- Prevention of marine pollution
- Conservation of ecosystems
- **Management of fisheries resources** (JICA's priority)
- Boosting economic benefits and promoting small-scale artisanal fishers

1. Background

- **Management of fisheries resources has been one of JICA's priority areas**
⇒ Reason
 - 1) Socio-economically important especially among developing countries,
 - 2) Huge needs of capacity development and
 - 3) Japan has enough experiences and technology
- **Free and Open Indo Pacific** of Japanese Government (2016).
- JICA commenced its activities particularly on **Countermeasure to IUU fishing** as a part of fisheries resources management in some countries.

ASEAN-JICA Cooperation of Capacity Building on IUU Fishing Countermeasures in Southeast Asia	
Project Objective/ Outcome	
To improve the understanding of participants from AMSs of the practices and actions necessary to deter IUU fishing and to think about the tangible countermeasures that could be adopted in their own countries as well as strengthen concrete countermeasures.	
Activities	
<ol style="list-style-type: none"> 1. Training on responsible fishing technologies/practices to combat IUU fishing 2. On-site training on ecosystem approach to fisheries management for eliminating IUU fishing of small-scale fisheries 3. Regional capacity building workshop on enhancing policies and countermeasures against IUU fishing 	

ASEAN-JICA Cooperation of Capacity Building on IUU Fishing Countermeasures in Southeast Asia		
Next Steps and Events(Tentative)		
Timeline	Event	ASEAN-JICA Cooperation
May 2019	Signing of Japan-ASEAN Technical Cooperation Agreement	
June 2019	<ul style="list-style-type: none"> ■ ASWGFI(ASEAN Fisheries Working Group on Fisheries) (27 to 29 June) in Vietnam 	<ul style="list-style-type: none"> -Presentation at ASWGFI -Information Exchanging with ASEC (Food, Agriculture and Forestry Division, ASEAN Economic Community Department) -Information Exchanging with SEAFDEC
2020-		<ul style="list-style-type: none"> -Drafting Project Proposal (Regional Training) - Approval of the Project Proposal by both ASEAN and Japan - (Dispatch Detail Design study team) - (Record of Discussions for ASEAN-JICA Cooperation) - Start Project

Thank you!

E-mail: Sakaguchi.Kota@jica.go.jp

STATEMENT

By Mr. Yutaka Nakai
The Gifu Prefectural Inland Fisheries Training Center



★ Inland Fisheries in Gifu Prefecture

- Location of Gifu Prefecture
- Situation of Inland Fisheries in Gifu Prefecture
- GIAHS “Ayu of the Nagara River System”
- Introduction on the Research Institute

★ Inland Fisheries Training Center

- Introduction on the Training Programs
- Activity Plans of the Training Center in 2018

2

Located of Gifu

- ◆ Gifu Prefecture is located at the center of Japan and is an inland prefecture which does not border the sea.
- ◆ Gifu Prefecture has a diverse geography, including plains at 6m altitude and mountains at 3,000m altitude, and is home to variety of fishes.

3

Inland Fisheries in Gifu Prefecture

- ◆ Fisheries industries of Gifu Prefecture consist of inland fisheries and freshwater fish aquaculture
- ◆ Ayu is the most important fish species in Gifu.

Inland Fisheries

Fish catch : 602 tons
Target species for fishing : approximately 20 species (ayu, amago trout and carp, etc.)

Fish catch in 2017

Cast-net Fishing

Freshwater Fish Aquaculture

Aquaculture production : 1,307 tons
Target species for farming: 15 species (ayu, rainbow trout, etc.)

Aquaculture production in 2017

Ayu Farm Using Ground Water

4



Gifu Prefectural Research Institute for Fisheries and Aquatic Environments

This Research Institute was established with the aims of contributing to the promotion of inland fisheries, freshwater fish aquaculture and the conservation of healthy aquatic ecosystems, therefore it makes efforts to experiment, research and promote this purpose.

- Location -

Headquarters Gero Branch

- Organizational Chart -

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    graph TD
      Director[Director] --> Ecological[Ecological Environment Dept.]
      Director --> Resource[Resource Breeding Dept.]
      Director --> Training[Fisheries Training Dept.]
      Director --> Gero[Gero Branch]
    
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6

Primary Research Programs of the Gifu Prefectural Research Institute for Fisheries and Aquatic Environments

Fisheries Section

- Development of effective fry release techniques in accordance of the change of the number of fishery resources such as ayu and salmonidae
- Development of effective and efficient construction techniques of spawning grounds for ayu and salmonidae
- Development of release methods through considering genetically consistent fish with indigenous ayu and salmonidae

Aquaculture Section

- Development of high added-value fish using biotechnology including feminization of all ayu and triploid bred of salmonidae
- Development of effective aquaculture techniques for catfish and sculpin
- Development of highly resistant ayu to fish diseases through selective breeding

Ecological Environment Section

- Surveys and research of rare fish on off-site conservation, etc.
- Surveys and research of fish species on the improvement of their inhabit
- Surveys and research of fish species using the environmental DNA testing as well as their estimated number

Gifu Prefectural Inland Fisheries Training Center

Purpose

We seek to contribute to both GIAHS and the potential of inland fisheries in developing regions through the dissemination of the knowledge, techniques, and expertise of fishing and breeding that supports "Ayu of the Nagara River System", itself designated as a GIAHS.

Primary Objectives

- Training programs will be conducted in developing regions with content tailored to their needs and requests regarding the management and aquaculture expansion techniques of inland fisheries.
- To cooperate with international organizations to dispatch experts to developing regions in order to provide assistant for better skills and techniques.

Primary Training Fields

- GIAHS "Ayu of the Nagara River System"
- Environmental Conservation Initiatives in Consideration of the Links with Mountains, Rivers, and the Sea
- Fishery Zone Management by Fisheries Cooperatives
- Aquaculture Dissemination Techniques

Primary Contents of Our Training Program	
Program	Contents
Lecture	<ul style="list-style-type: none"> ● Globally Important Agricultural Heritage Systems <ul style="list-style-type: none"> ● GIAHS and the Certification Procedure ● GIAHS "Ayu of the Nagara River System" ● The Nagara River System and its action plan ● Environmental Conservation Initiatives in Consideration of the Links with Mountains, Rivers, and the Sea <ul style="list-style-type: none"> ● Clean river conservation (legal system and efforts) ● Significance of biodiversity and preservation measures ● Preservation examples of rare fish species ● Fishery Resource Management by Fishery Cooperatives <ul style="list-style-type: none"> ● Increasing fishery resources (definitions, categorization, etc.) ● Propagation method (release of fry, release of artificially hatched juvenile fish, construction of spawning grounds, etc.) ● Fishery resource management system with Ayu as illustrative example (legal system and efforts) ● Aquaculture Technology <ul style="list-style-type: none"> ● Increasing ayu, salmon and/or trout, carp, catfish, etc. ● Production of triploid fish, Fish disease diagnosis
Excursion	<ul style="list-style-type: none"> ● Facilities to support "the Nagara River System" <ul style="list-style-type: none"> ● Fishery Cooperatives (ayu cargo market) ● Production facility of ayu fry for release ● Traditional fishing methods in Gifu Prefecture and some related facilities (common trout fishing, angling ayu by decoy, net fishing, yara fishing, etc.) ● Old streets which remain wisdom to protect clear waters ● World Freshwater Aquarium Aquatotto Gifu ● ICID World irrigation facility heritage "Sodai Irrigation Channel" ● Other aquaculture facilities <ul style="list-style-type: none"> ● Spawning ground rivers and artificial rivers, Facilities for processing fishery products, Private aquaculture farms (salmon and/or trout, sturgeon, catfish, King Prawn, etc.)
Practical training	<ul style="list-style-type: none"> ● Aquaculture Technology : Ayu, salmon and/or trout, sturgeon, catfish, etc. ● Juvenile fish diagnosis technology : Optometric observation of tissue, DNA and RNA extraction and their increase ● Production technology of triploid fish : Feminization or triplication of ayu or trout, etc.

Activity Plans of Training Center for Next Year (SEAFDEC related)

- **Acceptance of Trainees**
 - Number of Trainees : About 5 people
 - Recruiting Period : Around May 2020
 - Duration of Training : About 1 - 2 weeks
 - Training Period : Around late September (scheduled)
 - Training Contents : Will be decided from training menu upon discussion
 - Training Cost : Gifu Prefecture covers almost all of expenses including daily allowance
- ※ However, the budget is currently under discussion with Gifu Prefectural Finance Division and above contents are subject to change.
- **Dispatch of Specialists (TBD)**
 - Please contact us if needed.
 - Contents : On-site guidance of propagation and aquaculture technique, support on activities for certification of GIAHS, joint research.

Training Scenes from This Year (SEAFDEC related)



Lecture on proper management of fishery resources and fishery system



Practical training on activation of testicular sperm



Experience Japanese traditional fishing



Visit to artificial spawning river

Dispatch History of Specialists

- Country : Thailand
- Contents : Technical support on reproduction of rainbow trout (ふ化率の向上など)
- Period : Since 2016
- Result : 採卵後の親魚の生残率が約1.5倍に上昇、稚魚までの生残率が約2倍に上昇など






STATEMENT

By Ms. Cristina Velez Srinivasan

*The United States Agency for International Development/Regional Development Mission for Asia
(USAID/RDMA)*

Good afternoon. The U.S. Government would like to extend its gratitude to SEAFDEC for the opportunity to participate in this 42nd Program Committee Meeting. We would also like to extend our thanks to the Government of Thailand for its hospitality and leadership in hosting this important meeting, to each of the SEAFDEC Member Countries, and to representatives from the Japanese Trust Fund, Government of Sweden, the Food and Agriculture Organization, the World Bank, and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The U.S. Government, through the U.S. Agency for International Development, has many reasons to be thankful to SEAFDEC, its Member Countries, and the many esteemed international partners represented here today. Since 2015, SEAFDEC and USAID have partnered under the Oceans and Fisheries Partnership—commonly known as USAID Oceans. Now in the final year of the program, we are able to reflect back upon the progress we have made in regional traceability, fisheries management, and the human aspects of Southeast Asia's fisheries. USAID is proud to be a part of this supportive, effective partnership to advance sustainable fisheries in Southeast Asia, and for your collaboration and support.

We congratulate SEAFDEC and each of the Member Countries here today on this successful meeting and on the impressive results described during the program implementation updates. We appreciate this opportunity to convene with you all to review progress, discuss regional concerns, and ask questions to promote continuous improvement in the partnerships and joint-initiatives throughout the region.

Although USAID Oceans is now in its final year, USAID is committed to continued progress and engagement in sustainable fisheries. Since the program's launch, USAID has maintained and expanded its portfolio of programs throughout the region to build the resiliency of Southeast Asia's fisheries and enhance the capacities and livelihoods of the millions of individuals who support it. These initiatives include the global USAID Seafood Alliance for Legality and Traceability, the regional USAID Counter Trafficking in Persons program, the USAID Sustainable Ecosystems Advanced program, the USAID Fish Right program, and USAID INVEST.

The U.S. Government looks forward to continuing to support the region through these programs and those that follow. We are enthusiastic about the proposed programs for 2020 that will be shared during this meeting and look forward to building on existing partnerships and identifying new opportunities to work together towards shared objectives.

Since the launch of USAID Oceans, there has been a significant and steady increase in regional interest for electronic traceability technologies, improved sustainable fisheries management, and enhanced human welfare in the sector. We now see regular discourse and frequent requests for new partnerships in these areas—of which SEAFDEC has played an essential role.

From 2015-2019, USAID Oceans and SEAFDEC Member Countries have worked together to: 1) develop the first known sub-regional fisheries management plan for the Sulu-Sulawesi Seascape, protecting over 100 hectares of marine habitat areas, 2) track more than 2000 metric tons of seafood through the supply chain using electronic traceability systems, 3) expand the electronic ASEAN catch documentation scheme throughout ASEAN Member Countries, 4) increase awareness of the human welfare aspects of fisheries, particularly the importance of gender equity in the sector, and 5) engage the private sector in fisheries management and technological innovation.

Looking beyond USAID and SEAFDEC's partnership under the current USAID Oceans program, there is a continued and great need to effectively manage and conserve Southeast Asia's fisheries through collecting and using data to guide management efforts. USAID is fully committed to doing its utmost to contribute to this end, and we believe that SEAFDEC and associated Member Countries play a critical role. SEAFDEC and member country efforts to develop catch documentation and traceability solutions are key to reducing illegal, unreported, and unregulated fishing and improving fisheries management. USAID would like to congratulate and thank SEAFDEC for the progress we have made and will continue to make through USAID Oceans and beyond.

USAID will continue to facilitate engagement of U.S. Government agencies and counterparts toward shared goals. We will continue to work with our bilateral missions to leverage efforts and resources to maximize impacts, and we will continue to engage with regional partners like the CTI-CFF, RFMOs, FAO, and others to synergize efforts. And most importantly, USAID will continue to seek ways to build on our relationship with SEAFDEC to promote its leadership and advance SEAFDEC Member Countries towards national and regional goals.

Only through the dynamic partnership offered by the ASEAN-SEAFDEC platform can we convene some of the best minds; capture and apply best practices; agree to joint implementation; and cross-learn to adopt a catch documentation and traceability model that can be applied and adapted to address varying needs across the region. To create sustainable change and optimize resources, USAID welcomes ongoing cross-project collaboration and coordination. We look forward to continued and deeper engagement with each of you to further our mutual objectives during the final year of the USAID Oceans program and through those that follow.

Thank you again for the opportunity to participate in another successful PCM—I look forward to the discussions to follow and our continued collaboration over the coming years.

USAID/RDMA's MARINE CONSERVATION ACTIVITY

Project Title: USAID/RDMA's Marine Conservation Activity

Prospect Funding Agency: USAID

Lead Department: TBD

Proposed Budget: TBD

Duration: Estimated for 5-years

1. Background/Introduction

USAID intends to build off the successes of the USAID Oceans activity to continue advancing efforts to combat IUU fishing and to promote sustainable fisheries and the conservation of marine biodiversity. To guide future programming, USAID developed a draft situation model (see attached) and context analysis which visually describes the current context for an anticipated regional activity and identifies leverage points which could be chained through strategic interventions. This context analysis and draft strategic approaches are described below.

Program focal interests - The model describes the broad goals of the program as improving the management and conservation of areas of high marine biodiversity within the geographic area of the U.S. Government's Indo-Pacific Strategy. Specific biodiversity focal interests include representative habitats, coral reefs and reef-associated species, high-value species, protected species, and charismatic megafauna. Improved management of this natural capital is expected to advance human wellbeing by supporting food security, sustainable trade, stability and rule of law, equitable economic growth, livelihoods in coastal communities, and improved integration of human welfare into fisheries value chains.

Threats to biodiversity - The model identifies four broad threats to marine biodiversity in the region: climate change; marine and land pollution, including plastics; poorly planned development; and fishing related threats, including unsustainable fishing and IUU fishing. Based on a ranking of these threats and an assessment of the manageable interests of USAID, this situation model focuses on the threats to biodiversity from fishing-related activities.

Drivers of unsustainable and IUU fishing - The model hypothesizes that the main driver of fishing-related threats to marine biodiversity is overcapacity in the sector, resulting from inadequate enforcement of existing fishing and trade laws as well as inadequate fisheries management at multiple scales (regional, national, and subnational). The model proposes that the reason for weak enforcement and fisheries management is that current market and regulatory arrangements do not adequately incentivize compliance with rules and support for more sustainable management, and it identifies three key drivers for this situation: 1) currently there are high economic rewards with low risk of getting caught or punished for rule-breaking, which results in widespread corruption and abuse in the sector; 2) current information flows slow trade, accountability, and decision-making; and 3) regional organizations are not effectively facilitating transboundary management and enforcement. The situation model suggests that inefficiencies in the current flows of information are partially due to the slow uptake of eCDT tools in the sector due to a range of barriers, and that a key reason for weak performance by regional organizations is a lack of constructive engagement by multiple stakeholders, including industry, civil society, academia, and governments. Finally, the model identifies root causes of the current situation as including: increasing demand for cheap fish for protein and feeds, poor working conditions, lack of organization and voice among small-scale fishers to advocate for more equitable distributions of catch and profits, and a high demand for employment in fisheries.

2. Goals/Strategic Approaches

Strategic approaches - Based on USAID's draft situation model, five draft strategic approaches were identified as potential areas for USAID targeted investments to reduce IUU and unsustainable fishing and conserve marine biodiversity in Asia:

1. ***Advance Regional Seafood Traceability*** - Promote the uptake and use of eCDT tools by governments and industry to increase transparency in the seafood supply chain, reduce IUU fishing practices, improve data management, and aid in fisheries management planning;

2. ***Demonstrate Regional Transboundary Fisheries Management*** - To manage fisheries effectively, stakeholders need a well-designed set of management principles codified as law, the law needs to be enforced, and there needs to be a mechanism to inform and adapt governance and fisheries management as conditions change. Management principles are legally established in the region but they are poorly and unevenly enforced. Enforcing the law is outside of the mandate of USAID, but a substantial contribution could be made by creating a data system that informs the governance and the science of sustainable catch and fisheries management at a regional scale. USAID could work to demonstrate successful multi-national implementation of sub-regional EAFM plans to advance marine biodiversity conservation and fisheries management capacity that promotes the use of eCDT systems for data-driven fisheries management;
3. ***Private Sector Engagement*** - Work with the private sector to increase the impact of marine conservation efforts through uptake and use of eCDT solutions throughout the supply chain and to support improved human welfare conditions and gender equity in the fisheries sector. Gender equitable supply chains, with empowered women and men, lie at the heart of regional fisheries management solutions;
4. ***Strengthen Regional Cooperation*** - Work with regional organizations and stakeholders to develop a strong and lasting regional understanding and consensus of the critical importance to reduce IUU fishing and unsustainable fishing in Asia;
5. ***Strengthen Regional Institutional Capacity*** - Work with regional organizations and government *partners* to build the capacity of institutions in Asia to combat IUU fishing, promote sustainable fisheries, and conserve marine biodiversity in the region.

3. Expected Outputs/Outcomes

TBD

4. Progress and Status

Concept planning stage

RESOLUTION AND PLAN OF ACTION ON SUSTAINABLE FISHERIES FOR FOOD SECURITY FOR THE ASEAN REGION TOWARDS 2030

The Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 (RES&POA-2020) were prepared by the ASEAN-SEAFDEC Member Countries in collaboration with ASEAN and SEAFDEC, and were adopted by the Countries during the Ministerial and Senior Officials Meeting of the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 “Fish for the People 2020: Adaptation to a Changing Environment” held during 13-17 June 2011 in Bangkok, Thailand. The RES&POA-2020 are envisaged to serve as policy framework and priority actions to support sustainable development of fisheries and enhancing the contributions from fisheries to food security and better livelihood of people in the region towards the coming decade.

On the occasion of the 5-year implementation of RES&POA-2020 in 2015, SEAFDEC Secretariat proposed to review the progress and results of the programs implementation based on the RES&POA-2020, and the priority issues to be addressed in ensuring sustainable fisheries development and enhancing the contribution of fisheries to food security in the Southeast Asian region. That was also to ensure that the implementation programs/activities are in line with the RES&POA-2020. To monitor the progress of the programs/activities implementation, the SEAFDEC Secretariat had prepared a survey questionnaire with the template for report on the implementation of the RES&POA-2020 which was sent to the AMSs for their cooperation and contributions to the said purposes. The feedback from the SEAFDEC Member Countries to the questionnaire for mid-term implementation of the RES&POA-2020 was reviewed and presented at the Thirty-Eight Meeting of the Program Committee of the SEAFDEC in November 2015.

Considering that the RES&POA-2020 have a specific timeframe towards 2020 which would be approaching very soon, the SEAFDEC Council at its 50th Meeting in 2018 suggested that this document should be reviewed in order to ensure that it is still up to date. Moreover, as the RES&POA-2020 were endorsed under the ASEAN mechanism. The Council stated that the need to review this document should be raised at the forthcoming meetings of the FCG/ASSP and ASWGFi. Upon consideration by these two meetings, the ASEAN-SEAFDEC Member Countries agreed to designate their respective focal points to review the Resolution and Plan of Action.

In this connection, the SEAFDEC Secretariat carried out regional meetings on “Way Forward of the Resolution and Plan of Action for the ASEAN Region Towards 2020” in May and September 2019. The first regional meeting held in May 2019 aimed to review the progress made by ASEAN Member States focusing on the outputs/outcomes attained at national level, and those of SEAFDEC and other regional and sub-regional partners in the implementation of the RES&POA-2020. The Meeting also discussed and identified other fisheries-related priority/emerging issues which should be considered in reviewing the RES&POA, and would attempt to establish the possible links between RES&POA-2020 with other fisheries policy development process in the ASEAN. Additionally, the first meeting would allow SEAFDEC to facilitate preparation of draft RES&POA beyond 2020 with the inputs, supports and cooperation of AMS.

According to the feedback of the questionnaire results extracted for mid-term (2015) and final (2019), it was clarified that the activities implemented by the AMS are relevant with the RES&POA-2020, *i.e.* under the thematic areas consisting of planning and information, fisheries management, marine fisheries, inland fisheries, aquaculture, optimal utilization of fish and fishery products, fish trade, and regional and international policy formulation. Although the results of the questionnaire survey have the potential for application in sustainable fisheries development in the region, such feedback had been derived from three AMS only. It was suggested that evaluation of the implementation of the RES&POA should be discussed in the future as part of the monitoring and evaluation of its implementation.

The draft RES&POA Towards 2030 (RES&POA-2030) was developed at the first regional meeting. After the first regional meeting, the document was accommodated the comments from SEAFDEC Secretariat and the Departments, SEAFDEC Member Countries, as well as resource persons. In September 2019, the Secretariat organized the second regional meeting to finalize the draft of the RES&POA-2030. The following table shows issues and outputs from the series of events for reviewing the RES&POA-2020 and developing the RES&POA-2030:

Date and Events/Activities	Issues/Outputs
Early 2019	Establishment of the National Focal Point (NFP) for reviewing the RES&POA-2020 and drafting RES&POA-2030
May 2019 – the 1 st Regional Meeting	Key issues, challenges and concerns for revision of the RES and POA-2020
May to August 2019	Revising the draft RES-POA-2030 ad referendum (SEAFDEC Departments and AMSs)
September 2019 – the 2 nd Regional Meeting	Review the 3 rd draft RES&POA-2030 to come up with the 4 th draft RES&POA-2030
Before the end of September 2019	Obtain comments from the NFP
November 2019: 42PCM and 22FCG Meetings	Collect views from PCM and FCG, come up with the 5 th draft RES&POA-2030
End of November 2019	Submission of the 5 th draft to the NFP
April 2020: 52CM	Endorsement of the 5 th draft RES&POA-2030
End of April 2020	Circulation to FCG/ASSP Focal Point <i>ad referendum</i>
28 th ASWGFi Meeting (June 2020)	Endorsement of the final draft RES&POA-2030
After 28 th ASWGFi Meeting	Circulation of the final draft RES&POA-2030 to Council for Japan for adoption of the POA-2030 by SOM
41 st SSOM (August 2020)	Adoption of the POA-2030, endorsement of RES-2030 for submission to 42 nd AMAF
42 nd AMAF (August 2020) and Minister of Japan	Adoption of the RES-2030

REQUIRED CONSIDERATION BY THE PCM

The Meeting is requested to take note and provide views (if any) toward adoption of the RES&POA-2030.

References:

Appendix 1 of Annex 18. 4th Draft of Resolution and Plan of Action for ASEAN Region Towards 2030

Appendix 2 of Annex 18. List of Participants and Resource Persons – the 1st Regional Meeting on Way Forward of the Resolution and Plan of Action for the ASEAN Region Towards 2020, 1-2 May 2019, Bangkok, Thailand

Appendix 3 of Annex 18. List of Participants and Resource Persons – the 2nd Regional Meeting on Way Forward of the Resolution and Plan of Action for the ASEAN Region Towards 2030, 10-11 September 2019, Bangkok, Thailand

4th Draft of Resolution and Plan of Action for ASEAN Region Towards 2030

(As of ASEAN-SEAFDEC Regional Meeting on the Resolution and Plan of Action for ASEAN Region Towards 2030, 10-11 September 2019, Bangkok, Thailand)

Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030

We, the Ministers of the ASEAN-SEAFDEC Member Countries on the occasion of the Forty-second Meeting of the ASEAN Ministers on Agriculture and Forest (42nd AMAF) on xx August 2020 in Cambodia, with the Minister of Japan responsible for fisheries through *ad referendum*, taking into consideration the “Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020” adopted by the Ministers responsible for fisheries of the ASEAN-SEAFDEC Member Countries during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 “Fish for the People 2020 :Adaptation to a Changing Environment in 2011, and accommodating the emerging issues that could occur in the near future;

Reaffirming our commitment to the United Nations 2030 Agenda for Sustainable Development adopted in 2015, particularly those that contribute to achieving sustainable development and management of fisheries;

Bearing in mind the possible impacts climate change has on fishery resources, and noting ongoing efforts to address and better understand climate change under the United Nations Framework Convention on Climate Change UNFCCC (adopted in 1994, the Paris Agreement, and the Intergovernmental Panel on Climate Change ,IPCC)

Being guided by the 2007 ASEAN Charter, which aims to ensure sustainable development for the benefit of present and future generations and to place the well-being, livelihood, and welfare of the peoples at the center of ASEAN community building process;

Recognizing the ASEAN Community Vision 2025, and the Vision and Strategic Plan for ASEAN Cooperation in Food, Agriculture and Forestry (2016-2025) which are meant to achieve “A competitive, inclusive, resilient and sustainable Food, Agriculture, and Forestry (FAF) sector integrated with the global economy, based on a single market and production base contributing to food and nutrition security and prosperity in the ASEAN Community”;

Being aware of the ASEAN-Japan Cooperation through the ASEAN Plus Three Mechanism that aims to support the realisation of ASEAN Community Vision 2025;

Also **bearing in mind** the continuous efforts of the ASEAN Member States (AMSs) in ensuring the sustainable development of fisheries and aquaculture is in line with relevant international guidelines and agreements, *e.g.* the FAO Code of Conduct for Responsible Fisheries; and the Regional Guidelines on Responsible Fisheries in Southeast Asia, the Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region (RPOA-IUU) framework, and the ASEAN RPOA for the Management of Fishing Capacity;

Acknowledging the efforts of the AMSs in implementing the Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 adopted on 17 June 2011; and the Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating Illegal, Unreported and Unregulated Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products, adopted on 3 August 2016;

Recognizing the ASEAN-SEAFDEC Strategic Partnership that provides the cooperative platform between ASEAN and SEAFDEC in achieving the long-term common goals towards the development and management of sustainable fisheries through various regional initiatives;

DO HEREBY RESOLVE, without prejudice to the sovereign rights, obligations, and responsibilities of our countries under relevant international laws and arrangements, to:

1. Sustain the supply of fish and fishery products from the ASEAN to improve food security, facilitate poverty alleviation, and improve the livelihoods of ASEAN people dependent on the harvesting, farming and marketing of fish and fishery products, by enhancing the necessary national fisheries policies, legal and institutional frameworks that encourage and support responsible fisheries and aquaculture operations, including small-scale operations as well as providing supplementary livelihood options;

2. Further develop strategic partnerships and cooperation to maximize the synergies and complementarities among the various stakeholders, *e.g.* government, private sector, civil society, and relevant development

partners and donor agencies, in addressing regional and global challenges that may impact sustainable development of fisheries and aquaculture throughout the supply chain;
3. Promote capacity building of relevant organizations and stakeholders through mobilization of resources and harmonization of initiatives that support fisheries communities and governments, with due consideration given to gender equality;
4. Strengthen fisheries governance by evaluating current constraints to ensure comparability and compatibility of the required practices and the operations of fisheries in the AMSs;
5. Further develop regional initiatives to promote a responsible fisheries management mechanism, taking into account the specific social, economic, cultural, ecological, and institutional contexts and diversity of the ASEAN and ASEAN fisheries in the spirit of the realization of the ASEAN Economic Community and the ASEAN Socio-Cultural Community;
6. Implement effective management of fisheries that integrates habitat with fishery resources management, and aims to improve the social and economic benefits of all stakeholders, especially by delegating selected management functions to the local level and promoting co-management as a partnership between government and relevant stakeholders;
7. Promote sound management of fishing capacity and use of responsible fishing technologies and practices, recognizing increasing emphasis on rights-based fisheries; and at the same time, secure the rights and well-being of inland and coastal fisheries communities as well as the ecological well-being;
8. Strengthen cooperation among AMSs and with international and regional organizations in combating IUU fishing and management of fishing capacity to balance available resources;
9. Support the efforts to promote low carbon development technologies by minimizing the contribution of the fisheries sector to greenhouse gas emissions, with emphasis on promoting the use of energy-efficient equipment and alternative energy sources;
10. Enhance resilience of fisheries communities in anticipating and adapting to changes in the environments of inland and coastal waters, including those caused by climate change, which could adversely affect communities in their operations of fisheries and aquaculture;
11. Increase awareness and support the reduction of impacts of aquatic pollution and marine debris, including abandoned, lost or otherwise discarded fishing gear (ALDFG), and microplastics/microbeads on fisheries and aquaculture;
12. Strengthen knowledge, including local knowledge, and science-based development and management of fisheries by enhancing the national capacity to collect, analyze, and share fisheries data and information;
13. Improve the working conditions of people engaged in fisheries activities, and strengthen measures for safety of fishing vessels taking into consideration the specificity of fisheries of the region;
14. Enhance awareness of the contributions that inland fisheries have on food security and livelihoods, and ensure that the well-being of fishery resources and stakeholders are taken into consideration when undertaking development projects that could impact on the sustainability of inland fisheries;
15. Promote inter-agency coordination of the multiple uses of inland aquatic resources for the development of conservation measures for inland aquatic habitats;
16. Strengthen aquaculture governance and implement good aquaculture practices to sustain production for food safety and security, sustainable livelihoods, and rural development;
17. Promote cooperation among AMSs and with international and regional organizations to support the implementation of good aquaculture practices through joint research, technology transfer, and human resource development;
18. Mitigate the potential impacts of aquaculture on the environment and biodiversity including the spread of pathogens of aquatic animals caused by over-intensification of aquaculture operations, inappropriate implementation of aquatic animal health management, and uncontrolled introduction and movement of aquatic species;
19. Promote joint ASEAN approaches and positions in international trade in fish and fishery products produced in the region, by harmonizing the standards, criteria, and guidelines, and developing mutually-recognized agreements on sustainability and food safety management systems;
20. Support the competitiveness of the ASEAN fish trade through the development of procedures and programs that would certify, validate, or otherwise indicate the origin of fish and fishery products to improve product traceability, sustainable fishing practices, and food safety, in accordance with international and national requirements;
21. Optimize the utilization of catch/harvest by reducing post-harvest losses and wastes to increase fish supply and improve economic returns through promotion of appropriate technologies, facilities and best practices along the supply chain;
22. Improve and exchange technologies, and enhance facilities to ensure that fish quality assurance and safety management systems are in place and operational, taking into account the importance of traditional fishery

products and food security requirements, and promote the development of fishery products as supplementary livelihoods for fisheries communities;

23. Support the Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 adopted by the Senior Officials of the ASEAN-SEAFDEC Member Countries on [Date]; and to

24. Pledge our commitment to fully support this Resolution, and task the ASEAN Senior Officials to implement necessary actions and report the progress in the advancement of sustainable fisheries that contribute to a prosperous, stable, and peaceful ASEAN Community;

AND DO HEREBY DECIDE,

That the Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 be implemented as soon as possible and use the *Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030* adopted by the Senior Officials of the ASEAN-SEAFDEC Member Countries on the occasion of the Special Senior Official Meeting of the 41st ASEAN Ministerial Meeting on Agriculture and Forestry (SSOM-41st AMAF) held on xx August 2020 in Brunei Darussalam, and the Senior Official of Japan responsible for fisheries through *ad referendum*, as priority actions for formulating and implementing programs, projects, and activities by the AMSs and through the appropriate ASEAN-SEAFDEC mechanisms.

Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030

<p>The Senior Officials of the ASEAN-SEAFDEC Member Countries on the occasion of the Special Senior Officials Meeting of the 41st ASEAN Ministerial Meeting on Agriculture and Forestry (SSOM-41stAMAF) on xx August 2020 in Brunei Darussalam, with the Senior Official of Japan responsible for fisheries through <i>ad referendum</i>, taking into consideration the priority actions stipulated in the Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 adopted by the Senior Officials responsible for fisheries of ASEAN-SEAFDEC Member Countries during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 “Fish for the People 2020 : Adaptation to a Changing Environment” in 2011, as well as the emerging issues; and</p>
<p>Guided by the (Draft) Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030, and the need to enhance collaboration among government agencies that have the responsibility for fisheries and fisheries-related issues in order to harmonize policies, plans and activities that support sustainable fisheries, food safety and security at the national and regional levels;</p>
<p>Recognizing the progress made by the ASEAN Member States (AMSs) in the implementation of the Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020;</p>
<p>Recalling the initiatives of the AMSs to adopt the policy frameworks and instruments developed through the ASEAN-SEAFDEC Strategic Partnership (ASSP);</p>
<p>HEREBY DECIDE That the Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 should serve as priority actions for AMSs in developing and implementing programs, projects, and activities in support of the implementation of the Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 .</p>
<p>A. Planning and Information</p>
<p>1. Integrate the planning of marine capture fisheries, inland capture fisheries, and aquaculture sub-sectors to promote sustainable development of the fisheries sector, including harvesting and post-harvest in both capture fisheries and aquaculture;</p>
<p>2. Strengthen the capacity to plan for sustainable fisheries in the context of changing socio-economic and ecological environments through the mobilization of the most up-to-date data and information, and the provision of appropriate policy summaries for decision makers;</p>
<p>3. Strengthen national statistical mechanisms for fisheries and aquaculture including data collection disaggregated at species level, and exchange of statistical data; and include collection/ compilation of non-routine data and information, <i>e.g.</i> from fish consumption surveys, species composition, biological information, as well as local and indigenous knowledge, with the aim of improving the valuation of fisheries including monitoring of their performance;</p>
<p>4. Establish reference points, and come up with estimated biomass or capacity level to determine the maximum sustainable yield, allowable biological catch, or allowable effort for marine and inland fisheries;</p>
<p>5. Strengthen the collection of data and information, where relevant, on species under international concern, <i>e.g.</i> sharks and rays, sea turtles, catadromous eels, aquatic mammals, etc., and harmonize/standardize data collection methods among countries in the region;</p>
<p>6. Enhance regional fishery information systems and mechanisms to facilitate sharing, exchange and compilation of statistics and information required at the sub-regional and regional level, and apply where appropriate, regionally standardized definitions and classifications for statistical data to facilitate regional compilation, analysis, and data exchange;</p>
<p>7. Coordinate, decentralize and enhance the sharing of relevant statistics and fisheries-related data and information between the national fisheries and other authorities including those responsible for food security, environment, trade, aquaculture, water resources, agriculture/ forestry, wetlands, migration/ employment, and rural development;</p>
<p>8. Promote the use of simple and practical indicators that had been developed, for planning, monitoring, and evaluation of fisheries in support of achieving sustainability;</p>
<p>9. Share and exchange information on research findings, good practices, and experiences among countries, including national and regional institutions;</p>
<p>B. Fisheries Management</p>
<p>10. Regularly review, update and strengthen national fisheries policies, legal and institutional frameworks through consultation and engagement of government agencies, the private sector, fishers, civil society, and other relevant stakeholders;</p>
<p>11. Accelerate the development of fisheries management plans as basis for fisheries conservation and management;</p>

12. Implement measures to prevent unauthorized fishing and eliminate illegal fishing practices, <i>e.g.</i> strengthening enforcement of laws and regulations, establishing monitoring control and surveillance (MCS) mechanisms and network, developing and promoting responsible fishing practices, encouraging supplementary livelihood options;
13. Enhance implementation of comprehensive policies for fisheries management through (i)licensing systems boats, gear, and people; (ii) rights-based fisheries; (iii) supportive legal and institutional frameworks; (iv) strengthened institutional cooperation; and (v) streamlined co-management;
14. Strengthen the adoption of fisheries management approaches, <i>e.g.</i> co-management and ecosystem approaches to fisheries management, at all levels with all relevant stakeholders involved in the process of planning and policy formulation for management of natural resources, conservation, rehabilitation of habitats and protective geographical features, and improvement of human well-being;
15. Strengthen the capacity of fisheries communities and the capability of fisheries-related organizations (<i>e.g.</i> by empowering such organizations as appropriate) to implement necessary actions towards increased resilience, improved livelihoods, adoption of supplementary livelihoods, and poverty alleviation, in support of achieving sustainable development with gender integration in the process;
16. Enhance the participation of local communities, fisheries-related organizations, and other stakeholders in fisheries management and in fisheries and stock assessments by providing data, local ecological information, and traditional knowledge on the status of fisheries and stocks;
17. Raise awareness of the need to develop financial incentives, especially for small-scale stakeholders and cooperatives, <i>e.g.</i> micro-credit, with national and regional institutional assistance for the responsible development of fisheries enterprises and developmental activities that optimize economic returns;
18. Enhance the efficient use of energy by adapting appropriate technologies for fishing gear and fishing vessel design, and fishing operations; and promote the use of alternative energy sources;
19. Improve the capability of fishing crew and workers in fishing industry, and conduct educational and skills development program for new crew members and workers entering the industry; while also adopt appropriate technologies to optimize number of crew onboard fishing vessels;
20. Promote the implementation of good and appropriate employment practices in accordance with domestic laws and regulations or relevant international instruments;
21. Enhance the capacity of relevant authorities and communities to collaboratively resolve conflicts on resources utilization;
22. Explore the potential of under-utilized fishery resources through comprehensive fishery resources surveys, and promote their exploitation in a precautionary manner based on analysis of the best available scientific information;
23. Encourage the implementation of the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) and promote the collection of sex-disaggregated statistics on fishers and fish workers in the fish value chain;
24. Promote fair distribution of benefits gained from both intra-regional and international trade of fish and fishery products among small-scale actors along the whole value chain;
25. Monitor and assess the perceived impacts of climate change to fisheries and aquaculture; and adjust existing programs to take into consideration the effects of climate change and natural disasters, focusing on the programs for (i) developing appropriate adaptation and mitigation plans; (ii) integrating fisheries and habitats management; (iii) enhancing community resilience through livelihood diversification; (iv) strengthening local organizations; and (v) promoting safety at sea and other priority areas;
26. Assess and manage the impacts of aquatic pollution and marine debris, including abandoned, lost, or otherwise discarded fishing gear (ALDFG) and microplastics/microbeads, on fisheries and aquaculture;
27. Foster cooperation with other countries for the conduct of stock assessment on straddling, transboundary, highly migratory, and shared fishery resources, as appropriate, to serve as inputs for formulating science-based fishery management plan; and strengthen sub-regional and bilateral cooperation including inter-agency cooperation for management of such resources;
Marine Fisheries
28. Strengthen the implementation of measures and activities to combat IUU fishing by ensuring compliance with national laws and regulations, and with the provisions of relevant international instruments; encourage the development and implementation of national plans of action to combat IUU fishing; promote inter-agency coordination for effective implementation of laws and regulations; and enhance awareness and understanding of applicable international and regional instruments and agreements through information dissemination campaigns;
29. Establish and strengthen regional, sub-regional, and bi-lateral coordination on fisheries management and efforts to combat IUU fishing; and where appropriate promote the establishment of Monitoring, Control and Surveillance (MCS) network through inter-agency coordination and information sharing;

30. Mobilize regional/ sub-regional collaboration frameworks and tools for combating IUU fishing, <i>e.g.</i> <i>Regional Plan of Action to Promote Responsible Fishing Practices</i> including Combating Illegal, Unreported and Unregulated Fishing (RPOA-IUU) ; ASEAN Regional Plan of Action for the Management of Fishing Capacity (RPOA-Capacity) ; Regional Fishing Vessels Record (RFVR) ; ASEAN Catch Documentation Scheme (ACDS), and the use of technologies to support monitoring and surveillance of fishing activities, <i>e.g.</i> Vessel Monitoring System (VMS), traceability systems;
31. Support consultative dialogues at regional/sub-regional level among fisheries legal officers to share and exchange information on updated legal and regulatory frameworks in addressing issues in fisheries management;
32. Improve the capacity of relevant national authorities to effectively implement the requirements of port State measures and flag State responsibilities;
33. Intensify research on the impacts of various fishing gear types and methods on the ecosystem and populations of aquatic animals, and develop and promote environment-friendly fishing practices, <i>e.g.</i> low impact and fuel efficient (LIFE) fishing gears/methods;
34. Mitigate bycatch and discard concerns including excessive catch of juvenile fish by promoting the adoption and implementation of relevant regional and international guidelines, <i>e.g.</i> FAO International Guidelines on Bycatch Management and Reduction of Discards;
35. Promote resource enhancement approaches with appropriate monitoring and evaluation programs, <i>e.g.</i> deployment of appropriate resource enhancement structures, restocking of commercially-important aquatic species, and restoration of degraded habitats, taking into consideration possible socio-ecological impacts;
36. Ensure the integration of fisheries with habitats management by applying the concept of fisheries <i>refugia</i> in line with the Regional Guidelines on the Use of Fisheries <i>Refugia</i> for Capture Fisheries Management in Southeast Asia to complement the existing conservation and management measures;
37. Promote the adoption of different management approaches to sustainably manage major critical coastal habitats, <i>e.g.</i> mangroves, coral reefs and seagrasses; and develop and disseminate information and guidance on the use of appropriate tools and interventions;
38. Ensure safety at sea, decent working conditions and implementation of onboard fishing vessels sanitation, including the development of new design for fishing vessels, in compliance with relevant international standards;
39. Assess the possible impacts of subsidies on fisheries, particularly on the special requirements and the needs of small-scale fisheries in the region;
Inland Fisheries
40. Establish and implement comprehensive policies and supporting legal and institutional frameworks, and adopt ecosystem approaches to inland fisheries management that devolve co-management responsibilities to the local authorities and stakeholders, strengthen the rights of communities, and promote rights-based fisheries;
41. Enhance awareness of the importance of inland fisheries for local food security, and the importance of rehabilitating and restoring habitats for migratory inland aquatic animals, restocking indigenous aquatic species to enhance productivity (with monitoring and evaluation of restocking programs) and encouraging culture-based inland fisheries, where appropriate;
42. Monitor the impacts, and mitigate the negative impacts of invasive/alien species on the inland ecosystem and biodiversity;
43. Strengthen inter-agency coordination (national/ sub-regional) on multiple-use water resources of the wetlands/ flood-plains to sustain inland fisheries, mitigate conflicts among users and also encourage better coordination to address transboundary inland fisheries management issues;
44. Promote Research and Development (R&D) to understand the migration patterns, spawning grounds and seasons, and nursery grounds of important inland aquatic animals; and ensure the sustainability of inland fisheries by maintaining health of the ecosystem, particularly the inter-connectivity of habitats and the specific management needs during the dry season;-
45. Monitor and assess the impacts of the construction/operations of man-made structures that could alter the water ways and affect migration and spawning of aquatic animals, particularly those at risk of overexploitation, and develop mitigating measures and appropriate conservation and management measures for such impacts through consultative processes that may involve collaboration with regional organizations;
46. Encourage coordinated planning and management on the use of inland water bodies including rivers, floodplains, wetlands, etc . Through (i) resource enhancement programs; (ii) inland fisheries management programs; (iii) environmental impact assessment of structures on the aquatic resources; and (iv) restocking of indigenous and/ or commercially-important aquatic animals species taking into consideration concerns on genetic diversity; and build/improve the capacity of human resources and institutions in the implementation of such programs;

47. Formulate guidelines to promote the use of practical and simple indicators for inland/floodplain fisheries within the national inland fisheries management framework, to facilitate (i) timely local level fisheries management decisions with due respect to the large number of people/farmers that take part in fishing; (ii) dialogues to ensure that the inter-connectivity of fish migration path is kept as a tool for management/conservation measures; and (iii) adaptation to the effects of climate change within water bodies;
C. Aquaculture
48. Ensure that national programs and policies on aquaculture address social, economic, and environmental aspects of sustainable aquaculture to improve food security, livelihoods, and employment, and alleviate poverty by (i) providing the mechanisms and enabling policies for good aquaculture practices, efficient markets and fair trade; (ii) strengthening the capacity of small-holder fish farmers; and (iii) promoting inter-agency collaborations;
49. Develop and implement ASEAN guidelines for environment-friendly and responsible aquaculture and good aquaculture practices that cover (i) integration of quality and safety management systems for products with significant trade potentials; (ii) use of chemicals in aquaculture in relation to food safety; (iii) development of product traceability systems from farm to market; and (iv) implementation of quarantine and inspection / sampling procedures and Sanitary and Phytosanitary (SPS) measures for aquaculture products to ensure food safety;
50. Integrate aquaculture into rural development activities within the context of multiple-use of land and water resources through inter-agency coordination in policy formulation, project planning and implementation, stakeholder consultation, extension services and technology transfer; and participate in and provide support to regional initiatives that assess the role of aquaculture in poverty alleviation for better policy formulation;
51. Explore the use of advanced technologies for marine (inshore and offshore) and inland aquaculture, including the development of full-cycle breeding and aquaculture technologies for selected high-value species;
52. Implement measures or strategies at national and local levels to: (i) monitor and regulate aquaculture operations; (ii) prevent over intensification of aquaculture; and (iii) ensure that activities are carried out in a sustainable manner and that aquatic animal welfare is taken into consideration as appropriate; (iv) effectively enforcing regulations to avoid conflict in the use of common resources; and (v) adopt the concept of environmental carrying capacity including the implementation of good aquaculture practices;
53. Provide government support for R&D on: (i) improving existing genetic resources; (ii) assessing the impact of climate change on aquaculture; and (iii) improving the feeding and aquatic animal health management;
54. Promote the production and distribution of specific pathogen-free (SPF) and specific pathogen-resistant (SPR) broodstock and seeds through: (i) establishment of certified government or private hatcheries as sources of quality seed; (ii) dissemination of new breeding technologies and techniques for the effective distribution and maintenance of genetically-improved strains; and (iii) implementation of sound policies that promote better hatchery management practices, including the responsible collection and use of wild broodstock and seed;
55. Improve aquatic biosecurity by providing support to: (i) research on the development of domesticated, genetically improved, specific pathogen-free (SPF), and specific pathogen-resistant (SPR) aquaculture species; and (ii) small-scale hatchery operators and farmers to access healthy broodstock and improve their ability to adopt, at the farm level, the established techniques for aquatic animal health management;
56. Formulate and implement complementary and supportive policies that will: (i) build the capacity of fish farmers and hatchery operators in adopting broodstock and hatchery technologies and innovations; (ii) enhance fish farmers and hatchery operators' access to SPF/SPR broodstock and seeds produced through farmer-friendly broodstock management methods; (iii) foster strong cooperation between the public and private sectors engaged in development and dissemination of quality broodstock and seed stock; (iv) strengthen the capacity of fish farmers' groups, e.g. by empowering fish farmers' groups; and (v) promote development of a skilled workforce for the aquaculture industry;
57. Encourage good and appropriate employment practices in accordance with domestic laws and regulations or relevant international instruments;
58. Raise awareness of the need to develop financial incentives and micro-credit, with national and regional institutional assistance, for the responsible development of aquaculture enterprises and developmental activities that optimize economic returns;
59. Reduce the risk of negative environmental impacts, loss of biodiversity, and disease transmission by regulating the introduction and movement of aquatic organisms in accordance with relevant regional and international guidelines, e.g. the Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals;
60. Continue national efforts to prevent and control serious disease outbreaks by providing government support to: (i) R&D following standard procedures (e.g. OIE standards) in handling emerging diseases and surveillance of transmission of diseases; and (ii) regional initiatives on harmonization of regional disease control standards, disease reporting, and implementation of contingency plans to handle emerging diseases;

61. Further enhance capabilities in the diagnosis and control of aquatic animal diseases through: (i) continued support in development of technology and techniques for disease identification; (ii) promotion of the widespread use of users friendly, field-friendly, rapid and standardized diagnostic tests; and (iii) establishment of regional and inter-regional referral systems, including the designation of reference laboratories and timely access to fish health experts within the region;
62. Strengthen the implementation of regional warning systems on aquatic animal health and diseases to inform other AMSs of relevant epidemiological events and to raise awareness of emerging pathogens that may pose risks. Build emergency preparedness capacity through rapid and timely responses to reduce potential catastrophic consequences of emerging diseases as highlighted by ASEAN Network of Aquatic Animal Health Centres (ANAAHC);
63. Promote the prudent use of legal antibiotics in aquaculture, and monitor the impacts of Antimicrobial Resistance (AMR) on aquatic animals;
64. Improve the efficient use of aquafeeds by strictly regulating the quality of manufactured feed and feed ingredients, and support continued/applied research for developing suitable alternative protein sources that will reduce the cost and dependence on fish meal and other fish-based products, and subsequently promote regional sharing of information on feed ingredients; encourage the culture of species requiring no or low fish meal content in their feed and application of effective feeding management practices, taking into account the need for cultural and social acceptance of feed ingredients;
65. Undertake risk assessment of the culture of exotic aquatic species, and establish measures to prevent the escape of high risk species and their possible impacts on the natural ecosystem and biodiversity;
66. Improve human resource capabilities for responsible aquaculture through: (i) closer public and private sector collaboration in R&D, paying particular attention to the need for advanced skills in biotechnology and assessment of the efficacy and economics of the use of probiotics and immunostimulants including vaccines; and (ii) effective implementation of aquaculture education and extension services;
67. Formulate and implement national policies and strategies that will enable the aquaculture sector to adopt measures to mitigate the potential impacts of climate change and environmental stressors by providing support to R&D on climate change, and other environmental-related issues to increase resilience, strengthening the overall capacity of various stakeholder groups and fostering cooperation within the aquaculture sector and with other sectors, and developing standard procedures for disaster risks reduction in aquaculture;
68. Apply precautionary approach to safeguard the environment from the over-intensification and expansion of inland, coastal and offshore aquaculture;
69. Conduct risk assessment and R&D related to the use of Genetically Modified Organism (GMO) products in aquaculture (e.g. broodstock and aquafeeds) including food safety issues;
D. Optimal Utilization of Fish and Fishery Products
70. Strengthen support for the development and application of technologies and best practices that optimize the utilization of catches/farmed products, reduce post-harvest losses and wastes, value-add byproducts and valorize fish waste/trimmings in commercial and small-scale fisheries, aquaculture, and processing operations, through improved processing, facilities and infrastructure development, onboard and onshore handling, and storage, distribution and marketing of fish and fishery products;
71. Promote the production of and preserve the diversity of traditional fish products by assisting producers to secure stable supplies of quality raw materials and meet food safety requirements; and improve product identity, nutritive value and marketing. In the process, promote the identity of and other initiatives on local fishery products;
72. Strengthen fish quality and safety management systems that support the competitive position of ASEAN fish and fishery products in the world markets, including possible adoption of cold chain management standards and moving towards ISO22000 and ISO/IEC 17025 accreditation of national fish inspection laboratories; enhance capacity and acknowledge the recognized national laboratories, risk analysis and equivalence agreement, e.g. the Mutual Recognition Agreement (MRA); and promote the implementation of the quality and safety management systems among small and medium enterprises in the AMSs;
73. Encourage relevant control agencies at all levels to apply appropriate legislation and coordinated activities regarding the handling, processing, distribution, storage, marketing, quality, and safety of fish and fishery products;
74. Promote and conduct training programs and develop training materials to upgrade the technical skills and competencies of personnel in the public and private sectors on fisheries post-harvest technologies, and food quality and safety management systems;
75. Raise awareness of the need to develop financial incentives and micro-credit, with national and regional institutional assistance for the responsible development of fisheries and aquaculture enterprises, and developmental activities that optimize economic returns;

76. Encourage good and appropriate employment practices in accordance with domestic laws and regulations or relevant international instruments;
77. Adopt standards and guidelines for handling fish and fishery products, and implement hygienic fish handling onboard fishing vessels and provide training on fish and fishery products handling as part of the requirements for issuance of permits at all levels for fish vessel crews;
E. Fish Trade
78. Strengthen cooperation among AMSs to implement international standards with regards to trade in fish and fishery products within the ASEAN;
79. Implement regional/ ASEAN standards (e.g. ASEAN Good Aquaculture Practices (ASEAN GAqP), ASEAN Shrimp Good Aquaculture Practices (ASEAN Shrimp GAP), and ASEAN Policy Guidelines on Standards and Conformance) applicable for fishery and aquaculture products that are in line with international requirements and applicable to the region; and promote such standards to be acceptable by importing markets;
80. Encourage the implementation of appropriate international standards and strengthen programs relevant to Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT) measures, R&D, as well as capacity building and awareness raising on fish trade-related issues;
81. Encourage, as appropriate, the development of national laws, rules and regulations on trading of species in accordance with relevant rules of international law;
82. Strengthen cooperation and mechanisms among AMSs to work towards common positions that could be reflected in international fish trade related fora, e.g. World Trade Organization (WTO), Food and Agriculture Organization of the United Nations (FAO)/COFI Sub-committee on Fish Trade, Office International des Epizooties (OIE), Codex Alimentarius Commission (CAC), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
83. Engage the private sector (e.g. ASEAN Seafood Federation) in addressing trade-related issues, and in collaborative efforts to promote and sustain regional and international trade;
84. Assist small-scale producers to comply with standards on safety and quality of fish and fishery products by providing support programs including capacity building;
85. Assist small-scale producers from both capture fisheries and aquaculture in securing and maintaining access to markets at the national, regional and international levels, and in the process, develop marketing systems that are not capital intensive but are accessible for local producers;
86. Apply traceability systems with mechanisms as needed to certify or validate the information for the whole supply chain by harmonizing AMSs' inspection systems in line with international standards and strengthening port inspections process to improve traceability;
87. Encourage and provide guidance to develop/improve branding or eco-labeling of fish and fishery products that demonstrate the eco-friendly and socially acceptable nature of ASEAN products, including organic standards and coordination of Halal requirements;
F. Regional and International Policy Formulation
88. Increase participation and involvement of AMSs in international fora and technical committees, e.g. CITES, CAC, FAO, OIE, Regional Fisheries Bodies (RFBs), and WTO; and promote ASEAN interest, recognizing that fisheries policies of relevance to the ASEAN are increasingly discussed and agreed upon at the global level.

CAPACITY DEVELOPMENT WORKSHOP ON STOCK STATUS ASSESSMENT AND ESTIMATION OF SDG INDICATOR 14.4.1 FOR THE ASIA PACIFIC REGION

The Secretariat

Executive Summary

The Capacity Development Workshop on Stock Status Assessment and Estimation of SDG Indicator 14.4.1 for the Asia Pacific Region was organized from 2 to 4 October 2019 in Bangkok, Thailand, and hosted by the SEAFDEC Training Department (TD) and FAO. The objective of the workshop is to contribute to the *Strategic Objective 2 – Increase and Improve Provision of Goods and Services from Aquaculture, Forestry and Fisheries in a Sustainable Manner*. Specifically, developing capacity of the Asia and Pacific Region in Estimation and Reporting of SDG Indicator 14.4.1 on fish stock status.

The 2020 target of the UN SDGs for fisheries which are to end overfishing and rebuild overfished stocks to the level that can produce MSY. However, the SDG Indicator 14.4.1 particularly, is not well-known to the general public and its implementation is facing many challenges. The workshop's agenda includes:

- Understanding and Practical Work on SDG 14.4.1
 - World's Fisheries Status and Trends of Fishery Resources
 - SDG Goal 14 and Indicator 14.4.1
 - Data Requirements and Collection Process
 - Assessment Method of Stock Status to Estimate SDG Indicator 14.4.1
- National Assessment and Reporting Process of Indicator 14.4.1
- Recommendations

The workshop discussed and practices the methods developed by FAO to assess stock status to estimate SDG Indicators 14.4.1. The national technical group in charge for building the indicator need to establish a reference list of stocks was also discussed during the course of the workshop. Clarification on inputs of the countries and its timeline responding to the questionnaire developed by FAO was also discussed. Roles of SEAFDEC and FAO in providing the appropriate assistance to the countries was clarified and recommended for future promotion of the SDG Indicator 14.4.1.

The Sustainable Development Goals (SDGs), officially known as Transforming our world :the 2030 Agenda for Sustainable Development is set of 17 “Global Goals ”with 169 targets between them .Spearhead by the United Nations through a deliberative process involving its 193 Member States, as well as global civil society, the SDGs were adopted at the UN Sustainable Development Summit on 25-27 September 2015 in New York, USA.

The SDG Target 14.4 demands all countries :By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield (MSY) as determined by their biological characteristics.

FAO is a custodian agency for SDG Indicator 14.4.1 and has been requested to report progress of this indicator at regional and global levels and provide technical support to member states in reporting and monitoring of the SDG 14.4.1 at country level. This includes improving the capacity of countries to undertake fish stock assessments, through developing guidelines and manuals and delivering a comprehensive training program featuring workshops and seminars.

The Capacity Development Workshop on Stock Status Assessment and Estimation of SDG Indicator 14.4.1 for the Asia Pacific Region was organized from 2 to 4 October 2019 in Bangkok, Thailand, and hosted by the SEAFDEC Training Department (TD) and FAO. The objective of the workshop is to contribute to the *Strategic Objective 2 – Increase and Improve Provision of Goods and Services from Aquaculture, Forestry and Fisheries in a Sustainable Manner*. Specifically, developing capacity of the Asia and Pacific Region in Estimation and Reporting of SDG Indicator 14.4.1 on fish stock status. This workshop is part of FAO's capacity development effort for Asia and Pacific region that organized in collaboration with SEAFDEC Training Department.

The workshop's agenda includes:

- Understanding and Practical Work on SDG 14.4.1
 - World's Fisheries Status and Trends of Fishery Resources
 - SDG Goal 14 and Indicator 14.4.1
 - Data Requirements and Collection Process
 - Assessment Method of Stock Status to Estimate SDG Indicator 14.4.1
- National Assessment and Reporting Process of Indicator 14.4.1
- Recommendations

Understanding and Practical Work on SDG 14.4.1

World's Fisheries Status and Trends of Fishery Resources

During the discussion, with regard to the standard format of data and reporting mechanism from each country to assess the SDG Indicator 14.4.1, FAO has set up the criteria and test the effective and best methods for the national assessment. The workshop noted on the establishment of institutional focal points at the national level in order to strengthen the coordination among government agencies and FAO. With regard to the role of FAO in the reporting of the countries on SDG Indicator 14.4.1, FAO provides technical support in applying appropriate methods for assessing the data of the Southeast Asian region in collaboration with SEAFDEC. Moreover, FAO also assesses the global scenario and includes the report in SOFIA.

SDG Goal 14 and Indicator 14.4.1

Some countries have taken steps ahead and organized themselves, and directly reported to UN/DESA, such as establishment of fish moratorium, raising awareness among the communities the benefit of fisheries conservation and habitat protection, reducing fishing efforts, and providing fishery subsidy. The participants highlighted the priorities implementing under SDG Goal 14 which include eradicating poverty, securing food security, and establishing legal framework to protect larval fishes. In most countries, SDG 14 is not yet being addressed and public awareness is being worked out. The linkage, clarified during the workshop, between SDG Goal 14 and Indicator 14.4.1 includes the issue on climate change, sustainable use of water, and other environmental issue. Several urgent matters that need to be addressed for sustainability of fisheries for the countries include additional parameters for stock assessment by taking into account: the linkage between environmental/biodiversity and fisheries; overexploitation of fishery resources; aquatic pollution; overfishing; IUU fishing; habitat degradation; multispecies and multi-gear fisheries; weak MCS; inadequate reporting within the country and collaboration among countries of the shared stocks; insufficient monitoring of small-scale fisheries; cost and data collection; complicated collaboration among national agencies, etc.

Data Requirements and Collection Process

The catch data is only one of the important data for stock assessment. Regarding the relationship between MSY and the reference point, the unknown stock should be considered based on its cultural and ecological values which is important to be included in the reference point/list. With regard to the management of shared stock, specially Indo-Pacific mackerel and neritic tunas in the Gulf of Thailand, the countries should coordinate and manage together by sharing data and conducting assessment in order to maintain a sustainable level.

Assessment Method of Stock Status to Estimate SDG Indicator 14.4.1

FAO developed the assessment method of stock status to estimate SDG Indicator 14.4.1 for fitting the growth curve and definition of recruitment from several spawning periods in the respective countries/sub-regional areas within the year. During the course of the workshop, participants practiced the assessment methods of stock status to estimate the SDG Indicator 14.4.1 using three (3) stock assessment software as prepared and provided by the FAO, namely: CMSY, ELEFAN and Genetic Algorithm.

National Assessment and Reporting Process of Indicator 14.4.1

The national technical group in charge for building the indicator needs to establish a reference list of stocks. Fish stocks included in the list will be considered for the estimation of Indicator 14.4.1. The reference list should be: (i) based on data from the considered area (e.g. a country's EEZ and/or territorial waters and/or possibly the competence area of a regional fisheries management organization); (ii) representative sample of stock exploited in the country; (iii) developed through consultation with all stakeholders; and (iv) remain unchanged until necessary. Regarding the reporting process to FAO through the questionnaire (by the countries), this report will provide policy makers with comprehensive information on the state of fish stock as regional and global levels toward reading the SDG 14.4. The contents of the questionnaire include: three introductory sections and three data reporting sections (reference list of stock and status, stock information, and supporting time series), and two (2) supplementary information sections (metadata and feedback). Moreover, the

focal points for the reporting process include: national focal points (collecting, analyzing and compiling information for filling the SDG Indicator 14.4.1 questionnaire), principal focal point (leading the process of consultation with all stakeholders to define plan and working group for the uptake of Indicator 14.4.1), and alternate focal point (a leading scientist, at each of the agencies that is carrying out the assessment of fish stocks and is responsible for compiling the components of Indicator 14.4.1).

Recommendations

- VRE can be used as a community network for the countries to exchange experiences and skills on the national assessment and reporting process of the Indicator 14.4.1 where the countries can also request technical assistance from the experts in Japan in developing capabilities on the stock assessment
- SDG Indicator 14.4.1 should be simplified, and its scope should be downsized to allow faster response from the countries (tentatively scheduled to provide feedback to FAO by 31 October 2019, and end of the December 2019 for the report). The final report will be compiled and submitted to UNSD by the FAO as the testing phase of reporting protocol. FAO would provide the countries list of contacts to communicate with the national focal points for SDG 14.4.1. Subsequently, the countries could assist FAO to identify appropriate national contacts.
- Crucial role of SEAFDEC is to promote awareness of SDG 14.4.1 and assist the countries in the reporting process based on the FAO's technical assistance under data/information assessment methods which is suitable for being used for multi-species and –gears contexts.

DRAFT
PROCEDURES FOR ESTABLISHMENT OF COOPERATION
BETWEEN SEAFDEC AND OTHER ORGANIZATIONS

*(This document was prepared upon the request of the SEAFDEC Council for Japan
for comment by the PCM prior to submission for consideration by the Council)*

I. BACKGROUND

Since its establishment, SEAFDEC has created close cooperation with several organizations and non-member governments having a mutual interest to support and jointly carry out activities that are beneficial to the SEAFDEC Member Countries. This is in line with the Agreement Establishing SEAFDEC, of which the Article 12 on “Co-operation with Other Organizations” states that “*In order to fulfill its purpose, the Center may cooperate with governments and organizations external to the Center as well as other international organizations and, for this purpose, may conclude agreements or arrangements with those organizations.*” The Article 13 on “Assistance from Other Organizations” also states that “*The Center may, by a two-thirds majority vote of the total number of the Directors of the Council, receive assistance from governments and organizations external to the Center as well as other international organizations, provided that no condition contrary to the purpose of the Center is attached to such assistance.*”

Throughout the past decades, although the SEAFDEC Council has provided a number of directives for establishment of cooperative arrangements between SEAFDEC and other organizations, there is still no clear demarcation on the types of organization which SEAFDEC needs to seek approval of the Council prior to the establishment of cooperation, nor clear procedure in obtaining such approval of the Council. This document is therefore developed to serve as a guide for the SEAFDEC Secretariat and Departments in establishing cooperation with other organizations in the future.

II. FEATURES OF COOPERATION

The proposed cooperation between SEAFDEC and other organizations should have the following features:

- 1) The mandate and functions of both organizations should be taken into consideration in the cooperation;
- 2) The objectives of the proposed cooperation should complement and not duplicate with the existing works of SEAFDEC;
- 3) The cooperation shall be participatory in nature, with joint sharing of responsibilities and costs;
- 4) The expected output of the proposed cooperation should contribute to the effort of SEAFDEC in achieving its goals;
- 5) The program of activities of the cooperation should be within the priority areas of SEAFDEC’s plans and programs; and
- 6) The implementation of the activities under the cooperation should recognize the political, socio-cultural, and institutional considerations of the parties concerned and also of the countries hosting such parties

III. TYPES OF ORGANIZATIONS AND THE NEED TO SEEK PRIOR APPROVAL OF THE COUNCIL

There are several types of organizations that SEAFDEC Secretariat and Departments may wish to establish cooperation with in line with the Article 12 and Article 13 of the Agreement Establishing SEAFDEC. Nevertheless, the need to seek prior approval of the Council shall be different for different types of organization and natures of cooperation.

	Types of organization					
	SEAFDEC Member Countries				Non-Member Countries (government agencies, academes, private sectors and NGOs)	Other international/regional organizations and donor agencies
	Government agencies responsible for SEAFDEC*	Government agencies not responsible for SEAFDEC, and academes		Private Sectors and NGOs		
Host country		Non-host countries				
SEAFDEC Secretariat	No need to seek approval	NEED to seek approval	NEED to seek approval	NEED to seek approval	NEED to seek approval	NEED to seek approval
Department	No need to seek approval	No need to seek approval	NEED to seek approval **	NEED to seek approval **	NEED to seek approval ***	NEED to seek approval ***

Remarks:

* Arrangements could be established with government agencies responsible for SEAFDEC **only for specific projects/activities involving financial responsibility**

** For Member Countries, conduct of tailor-made/specialized training courses, accepting trainees to regular/existing training courses or conduct of exposure visits shall **not require** prior approval of the Council

*** For non-Members Countries and Other Organizations/Donors: conduct of tailor-made/ specialized training courses shall **require** prior approval from the Council; while accepting trainees to regular/existing training courses or conduct of exposure visits shall **not require** prior approval

Examples of organization that should fall into different categories are provided in *Appendix 1*.

For the existing arrangements between SEAFDEC (and SEAFDEC Departments) and other organizations, extension of such arrangements shall not require prior approval of the Council provided that there is no change in circumstances and the nature of cooperation

IV. PROCEDURES FOR ESTABLISHING COOPERATION

For establishment of cooperation that requires prior approval of the SEAFDEC Council, the procedures to seek approval of the Council shall be as follows:

- 1) SEAFDEC Secretariat and Departments that wish to enter into arrangements for cooperation and for receiving of funding support from government or organization external to the Center as well as other international organization shall communicate to seek approval from the SEAFDEC Council through the Secretary-General, either at the annual SEAFDEC Council meetings, or *ad referendum*.

In seeking *ad referendum* approval of the Council:

- a. The Department Chief requesting for establishing cooperation arrangement shall send official letter to the Secretary-General with a clear statement on the scope and justification for such arrangement.
- b. The Secretary-General shall send official letter to all SEAFDEC Council Directors (with an e-copy c.c. to National Coordinators) with a clear statement on the scope and justification for such arrangement; and the Council Directors would be requested to provide a response to the Secretariat by 21 days after the transmittal of the letter.

- c. The Council Directors of the respective countries shall inform the Secretariat of their decision through an official letter or e-mail by the designated date. For the Council Directors who do not provide a response to the Secretariat by the designated date, the Secretariat shall consider that such Council Directors have no objection to the request.
- d. The Secretariat shall keep a record of the decisions made by the Council Directors. The final decision shall be made as following:
 - o For Cooperation with Other Organizations (Article 12): by majority vote of the total number of the Council Directors;
 - o For assistance from Other Organizations (Article 13): by two-thirds majority vote of the total number of the Council Directors;
- e. The Secretariat shall inform to the requesting Department to notify the final decision of the Council whether or not the request is approved;

In signing of the arrangements, either with organizations that require or not require prior approval of the Council, the signatories shall be the SEAFDEC Secretary-General on behalf of the SEAFDEC Secretariat; and the Department Chiefs on behalf of their respective Department.

Once the arrangement is signed between the requesting Department and other organization, the Departments shall send a copy of signed arrangements to the Secretariat; and the Secretariat shall further send the copy of the signed arrangement to all Council Directors.

The signing of all arrangements between SEAFDEC and other organizations throughout the annual working cycle shall be reported to the SEAFDEC Council at its annual meetings.

V. REQUIRED CONSIDERATION OF THE PROGRAM COMMITTEE

The Program Committee is requested to provide comment, particularly on the types of cooperation and the need to seek prior approval of the SEAFDEC Council, as well as the procedure in establishing the cooperation.

Types of types of organizations, the need to seek approval of the Council, and some examples

With By	SEAFDEC Member Countries			Private Sectors and NGOs	Non- Member Countries (governme nt agencies, academes, private sectors and NGOs)	Other international/region al organizations and donor agencies
	Government agencies responsible for SEAFDEC*	Government agencies not responsible for SEAFDEC, and academes				
		Host country	Non-host countries			
Secretariat	No need to seek approval	NEED to seek approval	NEED to seek approval	NEED to seek approva l	NEED to seek approval	NEED to seek approval
Examples (MOU applies to the whole SEAFDEC)	Secretariat - AMAFRAD , Indonesia - AMAFRHR, Indonesia	Secretariat - University in Thailand (<i>e.g.</i> Burapha University)	Secretariat - FRA - Gifu prefecture - Universities in Japan	-	Secretariat - Ministry of Fisheries , Peru	Secretariat - FAO (LOA), JIRCAS - Colombo Plan, NACA - ASEAN, ASEAN Found. - Sida, Gov. of Sweden - ACIAR, CTI- CFF - UNEP, GEF, MRC - USAID (MOU, LOA) - US-DOI (MOU, LOA) - EU-CITES, JAIF

Department	No need to seek approval	No need to seek approval	NEED to seek approval **	NEED to seek approval **	NEED to seek approval ***	NEED to seek approval ***
Examples (MOU applies to specific Department)	- AQD - BFAR - DOF Thailand (on EPRS)	TD - DMCR, PMBC, FMO - Universities in Thailand - Vocational University Commission in Thai. AQD - DOST, PCAARRD in Philippines - Universities in Philippines	TD - NATC, Malaysia - RIHN, Japan AQD - Universities in Malaysia - Universities in Japan	TD - PTT, Thailand AQD - Companies in Philippines - Company in Singapore	TD - Government agencies of non-member (India) AQD - Government agencies of non-members (Pacific Island countries, India) - Universities in Korea, Iran, Australia, China, etc. - Scottish Association ... - INTECHMER, France - INVE Asia, China - Soybean Board, USA	TD - FAO (LOA) - JICA - ICES AQD - World Fish Center - JIRCAS, ACIAR, NACA MFRDMD - IDB IFRDMD - FAO (LOA)

Remarks:

- * Arrangements could be established with government agencies responsible for SEAFDEC only **for specific projects/activities involving financial responsibility for specific projects/activities involving financial responsibility**
- ** For Member Countries, conduct of tailor-made/specialized training courses, accepting trainees to regular/existing training courses or conduct of exposure visits shall **not require** prior approval of the Council
- *** For non-Members Countries and Other Organizations/Donors: conduct of tailor-made/ specialized training courses shall **require** prior approval from the Council; while accepting trainees to regular/existing training courses or conduct of exposure visits shall **not require** prior approval

CLOSING REMARKS

*By Ms. Malinee Smithrithee
SEAFDEC Secretary-General*

Ladies and Gentlemen, Good afternoon!

Finally, we have been through with the deliberations of the Forty-Second Meeting of the SEAFDEC Program Committee. I am therefore very appreciative to all of you for your active involvement in the discussions that lead us to valuable outputs that could be used to improve our programs and activities.

Accordingly, I would like to uphold your contributions and take this opportunity to extend my gratitude to our staff from the Training Department (TD) for their efforts that make this meeting flawless and successful. Also, my profound gratitude goes to the secretariat of the Meeting for coming up with the draft Report that we have just adopted.

Let me reiterate what I said in my Opening Remarks that the recommendations that we have just adopted especially with respect to the programs of SEAFDEC would be presented to the next Meeting of the FCG/ASSP. The output of such Meeting would be subsequently presented to the forthcoming SEAFDEC Council Meeting for final endorsement and approval, and inclusion in the overall activities of SEAFDEC. We are therefore very thankful to all of you for providing us with significant advice and proper guidance leading to the achievement of the objectives of this Meeting.

As our meeting is coming to an end, please allow me to extend our wishes to those who will leave Chaing Mai before the FCG/ASSP Meeting, for safe journey back to your homes. For the others, I will see you during the FCG/ASSP Meeting from tomorrow until Friday.

With that Ladies and Gentlemen, I now declare the Forty-second Meeting of the Program Committee closed. Thank you and have a good day!

Southeast Asian Fisheries Development Center (SEAFDEC)

What is SEAFDEC?

SEAFDEC is an autonomous intergovernmental body established as a regional treaty organization in 1967 to promote sustainable fisheries development in Southeast Asia. SEAFDEC currently comprises 11 Member Countries: Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.

Vision

Sustainable management and development of fisheries and aquaculture to contribute to food security, poverty alleviation and livelihood of people in the Southeast Asian region

Mission

To promote and facilitate concerted actions among the Member Countries to ensure the sustainability of fisheries and aquaculture in Southeast Asia through:

- i. Research and development in fisheries, aquaculture, post harvest, processing, marketing of fish and fishery products, socio-economics, and the ecosystem to provide reliable scientific data and information.
- ii. Formulation and provision of policy guidelines based on the available scientific data and information, local knowledge, regional consultations and prevailing international measures.
- iii. Technology transfer and capacity building to enhance the capacity of Member Countries in the application of technologies, and implementation of fisheries policies and management tools for the sustainable utilization of fishery resources and aquaculture.
- iv. Monitoring and evaluation of the implementation of the regional fisheries policies and management frameworks adopted under the ASEAN-SEAFDEC collaborative mechanism, and the emerging international fisheries-related issues including their impacts on fisheries, food security and socio-economics of the region.



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