

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

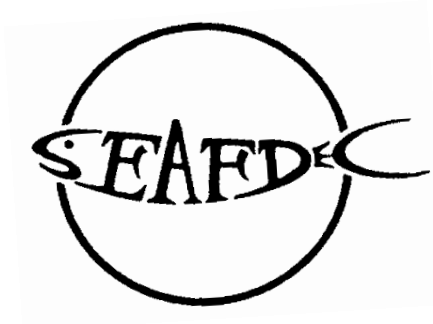
Langkawi, Malaysia  
5 - 7 November 2018



THE SECRETARIAT  
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

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## **PREPARATION AND DISTRIBUTION OF THIS DOCUMENT**

Report of the Forty-first Meeting of the Program Committee of the Southeast Asian Fisheries Development Center was prepared by the Secretariat of the Southeast Asian Fisheries Development Center (SEAFDEC). The Document is distributed to the SEAFDEC Member Countries, SEAFDEC Departments and concerned institutions.

## **BIBLIOGRAPHIC CITATION**

SEAFDEC. 2019. Report of the Forty-first Meeting of the Program Committee of the Southeast Asian Fisheries Development Center. Southeast Asian Fisheries Development Center, Thailand. 363 pp.

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## EXECUTIVE SUMMARY

The Forty-first Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Langkawi, Malaysia from 5 to 7 November 2018 and hosted by the SEAFDEC Marine Fishery Resources Development and Management Department (MFRDMD). The Secretary-General of SEAFDEC, in his capacity as the Chairperson of SEAFDEC Program Committee, chaired the Meeting which reviewed the programs implemented by SEAFDEC in 2018 and scrutinized the programs to be implemented in 2019 to ensure that these have been formulated and implemented in line with the priorities and needs of the Member Countries. The lists of SEAFDEC Programs and Projects for 2018-2019 appear in *Appendix 1*.

The Meeting noted **Programs under the FCG/ASSP Mechanism**, which comprise the twenty-three (23) 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 two (2) of the FCG/ASSP projects are scheduled to be completed in 2018, and one new project will be implemented starting in 2019. The Program Committee approved the implementation of the projects in 2018-2019, and provided recommendations which could be 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**
  - TD to consider in the future, the possibility of supporting the introduction of EAFM concept in three sites in Thailand, two for inland and one for coastal areas
  - TD to consider supporting an initiative in the promotion of EAFM at a new pilot site in Kaw Thaug, Myanmar
  - TD to consider extending the future project activities in Tonle Sap Lake of Cambodia
  - TD to share the lessons learnt from the different pilot sites, and consider the development of KPIs to facilitate evaluation of the project implementation
- (2) Optimizing Energy Use/Improving Safety Onboard in Fishing Activities**
  - TD to consider conducting in 2019 a pilot demonstration activity on improvement of fish handling onboard tuna purse seiner in Bin Dinh Province, Viet Nam
  - TD to investigate the significant outcomes of the project using measurable indicators to compare the situation before and after the project implementation
- (3) Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia**
  - TD to consider engaging aquaculture aspects in resource enhancement projects to enhance the production of the species for conservation, such as production of multi-species seeds for stock enhancement in natural habitats
  - TD to consider incorporating the development of effective FADs and FEDs, as well as formulating standard procedures for assessing the abundance of the resources prior to and after the deployment of FADs and FEDs
  - TD to consider extending the activities on crab bank to other sites in Cambodia, *i.e.* Kampot Province and to provide awareness raising materials for dissemination in the landing sites of the country's four coastal provinces
  - TD to invite Malaysia to take part as observer in the workshop on hilsa resources that will be conducted for Myanmar and Thailand
  - TD to consider conducting a workshop to introduce FEDs in Indonesia in 2019
  - TD to develop a basic model on sustainable resource enhancement that would also include aquaculture to guide the communities in making their own fisheries management programs

- (4) **Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia**
- IFRDMD to develop guidelines aimed at raising the awareness of local people about the importance of glass eels
  - IFRDMD to conduct biological studies aiming for the conservation of the eel resources
  - IFRDMD to consider the possibility of adopting appropriate stock assessment models that could make use of very limited data
- (5) **Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia**
- IFRDMD to continue exerting efforts to link this project with other relevant programs of IFRDMD on the promotion of inland capture fisheries
- (6) **Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management**
- The project would be completed in 2018
- (7) **Promotion of Countermeasures to Reduce IUU Fishing Activities**
- TD to consider in its plans for combating IUU fishing the following activities: 1) capacity building on fisheries surveillance to combat IUU fishing; and 2) regional capacity building on investigation and inspection techniques, and fisheries law enforcement to combat IUU fishing
  - TD to consider expanding the scale and contents of the project on combating IUU fishing
  - TD to seek the consensus of the Member Countries prior to the expansion of the RFVR to cover those vessels less than 24 meters in length
  - TD to consider communicating with FAO to request for updated information on the development of the Global Fishing Vessel Record ; and linking the RFVR with and serve as inputs to the FAO Global Fishing Vessel Record
  - TD to consider establishing a regional network for facilitating communication and exchanging of information on the status of implementation of the PSMA among the ASEAN Member States (AMSs)
  - TD to consider organizing an expert consultation to develop a harmonized protocol for vessel inspection at sea especially in areas within and beyond national jurisdictions, by contacting the concerned RFMOs to obtain information on their respective procedures for vessel inspection at sea
  - TD to consider conducting Training of Trainers on vessel inspection, as well as observers onboard fishing vessels
- (8) **Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand**
- The 41PCM took note of the progress of the project in 2018 and the proposed activities for 2019
- (9) **Offshore Fisheries Resources Exploration in Southeast Asia**
- TD to consider involving Thailand in the activity on tuna stock assessment in Sulu-Sulawesi Sea, and to extend to Thailand its training course on growth analysis based on otolith samples
  - TD to check with concerned RFMOs on their activities related to tuna stock assessment to ensure that the SEAFDEC stock assessment initiatives would support rather than duplicate the work of such RFMOs
  - TD to include brief results from the stock assessment activity when reporting on the progress to the next PCM as this would be useful in the discussion of the future workplan
  - TD to continue conducting stock assessment of tuna in Sulu-Sulawesi Sea, the results of which could be conveyed to WCPFC for their reference
  - TD to continue assisting Cambodia in strengthening the capacity of the country's fishery officers, especially in analyzing the data and finalizing the results of the survey undertaken in 2018 using the M.V. SEAFDEC 2
  - TD to exchange and disseminate information with the CTI-CFF especially the results of the works undertaken by SEAFDEC in this particular area
  - TD to consider including in this project, the modernization of fishing vessels for the sustainability of fishery resources

- (10) **Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region**
- The 41PCM took note of the progress of the project in 2018 and the proposed activities for 2019
- (11) **Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region**
- MFRDMD to provide technical assistance to the Member Countries in establishing reference points towards and harvest control rules for transboundary stocks, as well as to conduct biological studies on other important species such as round scads, neritic tunas, and sardines
  - MFRDMD to consider in the project future plan, providing technical assistance to the Member Countries on the analysis of appropriate Maximum Sustainable Yield (MSY) and Total Allowable Effort (TAE) of target species
- (12) **Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region**
- The 41PCM took note of the progress of the project in 2018 and the proposed activities for 2019
- (13) **Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia**
- The 41PCM took note of the progress of the project in 2018 and the proposed activities for 2019
- (14) **SEADFDEC-EU/CITES Sharks Project Phase II**
- The 41PCM took note of the progress of the project in 2018 and the proposed activities for 2019
- (15) **Strengthening the Effective Management Scheme with GIS (Geographic Information System) & RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMS**
- The 41PCM took note that this project would be implemented starting from 2019.

**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**

- (16) **Environment-Friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources**
- The 41PCM took note of the progress of the project in 2018 and the proposed activities for 2019
- (17) **Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region**
- AQD to consider including Thailand as participating country for Activity 5: Technology Extension and Demonstration considering that Thailand has large-scale aquaculture industry

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

- (18) **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**
- MFRD to consider including the harmonization of techniques for detecting and analyzing biotoxins from harmful algal blooms (HABs) in the region and the development of reference points for biotoxin analysis

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

**(19) Cold Chain Management for Seafood**

- MFRD to submit the guidelines on Cold Chain Management of Seafood to FCG/ASSP for support and subsequently, for submission to the next SEAFDEC Council Meeting for endorsement

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

- SEAFDEC Secretariat to update the information on international fish trade-related issues, and to upload the information on international trade in the respective countries of current RFPN members, in the SEAFDEC website by the end of 2018

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

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

- SEAFDEC to include Malaysia as one of the project sites in 2019 for the eACDS activities
- SEAFDEC to ensure that the eACDS would target not only commercial fisheries but also small-scale fisheries as this is a very important sub-sector for the region

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

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

- TD to consider the proposal of Viet Nam on the use of M.V. SEAFDEC 2 in the conduct of a survey of marine fisheries in Viet Nam, for a period of two months from June to August 2019
- TD to provide the services of its resource persons to support the conduct of a training course in Thailand on marine resources survey onboard a Thai research vessel in 2019
- TD to consider the proposal of Malaysia on the use of the M.V. SEAFDEC 2 for its mid-water trawl survey in Malaysian waters in 2019

**(23) Strengthening SEAFDEC Network for Sustainable Fisheries**

- TD to extend assistance to Cambodia in the modification of its marine fishing vessel database to accommodate the changes in vessel classification from Horsepower to length class
- SEAFDEC to sustain the regional and/or sub-regional mechanism in addressing fisheries-related issues, as well as to maintain such network for long-term after the completion of the relevant project supporting the mechanism

**Special Projects**

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

- SEAFDEC to communicate with the Government of Sweden requesting for the possible extension of the project after its completion in 2019
- SEAFDEC to promote the application of the SEAFDEC gender toolkit in Myanmar in 2019
- SEAFDEC to continue extending its support in strengthening the transboundary fisheries management in the upper Mekong River Basin between Lao PDR and Thailand (Bo Keo in Lao PDR and Chiang Rai in Thailand)
- SEAFDEC to discuss with the ASEAN Secretariat the possible submission of the results of the stock assessment and risk assessment of neritic tunas to concerned policy makers in the future
- SEAFDEC to sustain the activities on neritic tunas in order to obtain data that could serve as scientific basis towards the sustainable utilization of the species, considering that such work would complement the work of IOTC, and not duplicate any of the stock assessment initiatives of WCPFC

**(25) The Oceans and Fisheries Partnership (USAID Oceans)**

- USAID Ocean to establish appropriate channel for sharing of information particularly on the progress of its works in the project learning sites so that the developed technologies could be adopted by other countries
- USAID Ocean to respond to the suggestion of Thailand during the last ASWGF and the Oceans Technical Working Group (TWG) Meeting in 2018 on how the information collected from the learning sites could be shared, and on how the activities in the expansion sites in Thailand could move forward
- USAID Oceans to provide information to Thailand on the exact schedule and detailed workplan in support of expansion I and II sites as indicated in the 2019 project workplan

The Program Committee endorsed the progress of the **Departmental Programs** in 2018 which comprise nine (9) programs, six (6) of which were implemented by AQD, namely: 1) Quality Seed for Sustainable Aquaculture; 2) Healthy and Wholesome Aquaculture; 3) Adaptation to Climate Change; 4) Maintaining Environmental Integrity through Responsible Aquaculture; 5) Meeting Social and Economic Challenges in Aquaculture; and 6) Priority and Special Projects; and three (3) by TD, namely: 1) Promotion and Strengthening of SEAFDEC Visibility and Image; 2) Tailor-made Training Programs; and 3) Improvement of Fisheries Technology and Reduction of the Impact from Fishing. While these programs would be continued in 2019, the program on “Promotion and Strengthening of SEAFDEC Visibility and Image” would be merged with the program “Tailor-made Training Programs” and the new program title starting 2019 would be “Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building.” In addition to these on-going programs, MFRDMD would implement in 2019, the Collaborative Research between Japan International Research Center for Agriculture Science (JIRCAS) and MFRDMD, while IFRDMD would carry out two (2) projects, namely: 1) Stock Assessment and Fish Production Potential of Inland Fisheries; and 2) Center of Excellence in Science and Technology on Inland Fisheries Management. The Program Committee then provided recommendations on these programs which could be summarized as follows:

**1. Aquaculture Department**

- AQD to share the relevant information and technologies developed through its programs to the Member Countries
- AQD to consider sharing the knowledge on aquaculture technology to the Member Countries especially on broodstock management of tiger shrimps, as well as establishing the mechanism for sharing of information with other AMSs
- AQD to consider including in its future studies the culture of ornamental fish species, *e.g.* koi carp, for the benefit of countries that import broodstock from Japan
- SEAFDEC to consider supporting the activities related to increasing the value added to products that make use of seaweeds as raw materials

**2. Training Department**

- TD to allocate funds and assist Cambodia in conducting surveys to investigate the impacts from gears to the fishery resources, such as trawlers using small mesh-size and rat-tail traps
- TD to provide support to Thailand in the implementation of the project “Promotion of Appropriate Technology and Practices of Fishing and Fishing Gear Engineering in Freshwater Area in Thailand”
- TD to provide technical support to Indonesia in the conduct of training on safety at sea *e.g.* basic safety for fishing vessels in accordance with IMO regulations, as well as training to change the use of fishing gears that had recently become illegal
- TD to continue supporting Malaysia in the conduct of fishing gear training
- TD to share the results of the proposed activity in 2019 on the improvement of the technology to enhance the sustainability of marine fishery resources, once available

**3. Marine Fishery Resources Development and Management Department**

- The 41PCM noted the project proposal under the collaborative research between JIRCAS and MFRDMD which would be implemented in 2019



#### **4. Inland Fishery Resources Development and Management Department**

- The 41PCM noted the two projects which would be implemented by IFRDMD in 2019

The Program Committee also considered and endorsed the **Other Program** on “Implementing the Lower Mekong Fish Passage Initiative in Cambodia, Thailand, and Viet Nam” which was implemented in 2018 and would be continued in 2019.

The Program Committee also took note of the status of the two (2) **Pipeline Projects**:

**(1) Development of Stock Assessment Method and Strengthening of Resources Management Measures on Tropical Anguillid Eels in ASEAN Region**

- SEAFDEC Secretariat to continue seeking support from JAIF for the implementation of this project

**(2) Second Phase of Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management**

- MFRDMD to continue seeking support from JAIF and other potential donors to extend this project to Member Countries not involved in Phase I of the Project, *e.g.* Cambodia, Philippines, Thailand, and Viet Nam

The Program Committee noted the statements delivered by non-member governments and international/regional organizations, namely: the Bay of Bengal Programme Inter-Governmental Organization (BOBBP-IGO); the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF); the Gifu Prefectural Inland Fisheries Training Center in Japan; the Embassy of Sweden; and the United States Agency for International Development/Regional Development Mission for Asia (USAID/RDMA).

The Program Committee took note of the proposal on the “Way Forward for Resolution and Plan of Actions on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020,” and noted that the proposal and the workplan would be discussed during the 21FCG/ASSP Meeting, after which it would be proposed to the 51<sup>st</sup> Meeting of SEAFDEC Council.

On the Update on JTF-VII, the Program Committee expressed the gratitude to the Government of Japan for its continued support to SEAFDEC, and requested SEAFDEC to consider drafting a Council Resolution expressing the gratitude and appreciation of the Member Countries to the Government of Japan and requesting for continued support through the JTF-VII. In this connection, SEAFDEC would reiterate the need to seek the countries’ appreciation to Japan, during the 51<sup>st</sup> Meeting of the SEAFDEC Council.

The Program Committee took note of the draft SEAFDEC Gender Strategy which was developed in response to the directives of the SEAFDEC Council.

With regard to the draft “Procedures for Inviting Other Organizations and Non-member Governments to attend the SEAFDEC Council Meeting,” the Program Committee suggested further improvement of the draft Procedures, *i.e.* for the decisions by individual Council Directors to be kept by the Secretariat and not disclosed, and more elaboration on the roles and restrictions of observers. The Program Committee also suggested that the Procedures once approved by the SEAFDEC Council should be made available in the SEAFDEC website.

On the “Capacity Development Workshop on Stock Status Assessment and Estimation of SDG Indicator 14.4.1: Fish Stocks Sustainability for the Asia and Pacific Region,” of which SEAFDEC was approached by FAO to serve as coordinator and to facilitate the arrangements, the Program Committee expressed the challenges encountered by the Member Countries in reporting the progress on SDG Indicator 14.4.1, and proposed that the activities related to this SDG Indicator should be conducted on an annual basis and adopted by the SEAFDEC Council.

The Program Committee was informed of the formation of the Singapore Food Agency (SFA) which would take place starting 1 April 2019. SFA will continue to uphold Singapore’s commitment to implement the MFRD programme, and the Marine Aquaculture Center (MAC) would be the Collaborating

Centre to implement the MFRD programme. This matter would be proposed to the 51<sup>st</sup> meeting of the SEAFDEC Council for consideration.

The Program Committee adopted the **Report of the 41<sup>st</sup> Meeting of the SEAFDEC Program Committee** for submission to the 51<sup>st</sup> Meeting of SEAFDEC Council, and to the ASEAN through the 21<sup>st</sup> Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).



## SEAFDEC PROGRAMS AND PROJECTS FOR THE YEAR 2018-2019

## I. Program of Activities under FCG/ASSP Mechanism

Strategy/Project Title	Lead Department	2018	2019
<b>Strategy I: Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region</b>			
1. Human Resource Development for Sustainable Fisheries	TD	Y	Y
2. Optimizing Energy Use/Improving Safety Onboard in Fishing Activities	TD	Y	Y
3. Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia	TD	Y	Y
4. Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia	IFRDMD	Y	Y
5. Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia	IFRDMD	Y	Y
6. Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management	MFRDMD	Y	N
7. Promotion of Countermeasures to Reduce IUU Fishing Activities	TD	Y	Y
8. Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand	TD	Y	Y
9. Offshore Fisheries Resources Exploration in Southeast Asia	TD	Y	Y
10. Enhancing the compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region	TD	Y	Y
11. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD	Y	Y
12. Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD	Y	Y
13. Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia	SEC	Y	Y
14. SEADFDEC-EU/CITES Sharks Project Phase II	SEC	Y	Y
15. Strengthening the Effective Management Scheme with GIS (Geographic Information System) & RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMS <sup>1</sup>	TD	N	Y
<b>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</b>			
16. Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources	AQD	Y	Y
17. Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region	AQD	Y	Y
<b>Strategy III :Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region</b>			
18. 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	Y
<b>Strategy IV: Enhancing trade and compliance of the region's fish and fishery products with market requirements</b>			
19. Cold Chain Management for Seafood	MFRD	Y	N
20. Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products	MFRDMD	Y	Y

<sup>1</sup> This project was approved in 2018 and will be implemented in 2019.

Strategy/Project Title	Lead Department	2018	2019
<b>Strategy V: Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries</b>			
21. Assistance for Capacity Building in the Region to Address International Fisheries-related Issues	SEC	Y	Y
<b>Strategy VI: Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries</b>			
22. Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2	TD	Y	Y
23. Strengthening SEAFDEC Network for Sustainable Fisheries	SEC	Y	Y
<b>Special Projects</b>			
24. Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia	SEC	Y	Y
25. The Oceans and Fisheries Partnership (USAID Oceans)	SEC	Y	Y

## II. Departmental Programs

Project Title	Department	2018	2019
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. Adapting to Climate change Impacts	AQD	Y	Y
5. Meeting Social and Economic Challenges in Aquaculture	AQD	Y	Y
6. Priority and Special Projects	AQD	Y	Y
7. Promotion on Strengthening of SEAFDEC Visibility and Image	TD	Y	Y*
8. Tailor-made Training Programs	TD	Y	
9. Improvement of Fisheries Technology and Reduction of the Impact from Fishing	TD	Y	Y
10. Collaboration research between JIRCAS and SEAFDEC/MFRDMD	MFRDMD	N	Y
11. Stock Assessment and Fish Production Potential of Inland Fisheries	IFRDMD	Y	Y
12. Center of Excellence for Fisheries Management on Inland Waters	IFRDMD	Y	Y

\* In 2019, the “Tailor-made Training Programs” would be merged with the “Promotion on Strengthening of SEAFDEC Visibility and Image” under the new title of “Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building”

## III. Other Programs

Project Title	Department	2018	2019
1. Implementing the Lower Mekong Fish Passage Initiative in Cambodia, Thailand, and Viet Nam	TD	Y	Y

## IV. Pipeline Projects

Project Title	Lead Department	Period
1. Development of Stock Assessment Method and Strengthening of Resources Management Measures on Tropical Anguillid Eels in ASEAN Region	SEC	-
2. Second Phase of Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management	MFRDMD	-

Remarks:

Y = Program implemented during the year

N = Program not implemented during the year

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## LIST OF ACRONYMS

<b>ACDS</b>	ASEAN Catch Documentation Scheme
<b>ADSEA</b>	Aquaculture Development for Southeast Asia
<b>AHPND</b>	Acute Hepatopancreatic Necrosis Disease
<b>AMAF</b>	ASEAN Ministers on Agriculture and Forestry
<b>AMSs</b>	ASEAN Member States
<b>ANAAHC</b>	ASEAN Network of Aquatic Animal Health Centres
<b>APFIC</b>	Asia Pacific Fisheries Commission
<b>AQD</b>	SEAFDEC Aquaculture Department
<b>ARs</b>	Artificial Reefs
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>ASSP</b>	ASEAN-SEAFDEC Strategic Partnership
<b>ASWGFi</b>	ASEAN Sectoral Working Group on Fisheries
<b>AVA</b>	Agri-Food & Veterinary Authority of Singapore
<b>BOBP-IGO</b>	The Bay of Bengal Programme Inter-Governmental Organisation
<b>CDS</b>	Catch Documentation Scheme
<b>CDTS</b>	Catch Documentation and Traceability System
<b>CITES</b>	Convention on International Trade in Endangered Species of Wild Fauna and Flora
<b>CTI-CFF</b>	Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security
<b>DOF</b>	Department of Fisheries
<b>EAFM</b>	Ecosystem Approach to Fisheries Management
<b>EEZs</b>	Exclusive Economic Zones
<b>EMS</b>	Early Mortality Syndrome
<b>EC</b>	European Commission
<b>EU</b>	European Union
<b>FADs</b>	Fish Aggregating Devices
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FCG</b>	ASEAN-SEAFDEC Fisheries Consultative Group
<b>FEDs</b>	Fish Enhancing Devices
<b>GEF</b>	Global Environmental Facility
<b>GIS</b>	Geographic Information System
<b>HABs</b>	Harmful Algal Blooms
<b>IDB</b>	Islamic Development Bank
<b>IFRDMD</b>	SEAFDEC Inland Fishery Resources Development and Management Department
<b>ILO</b>	International Labour Organization
<b>IOTC</b>	Indian Ocean Tuna Commission
<b>IUU Fishing</b>	Illegal, Unreported and Unregulated Fishing
<b>JAIF</b>	Japan-ASEAN Intergration Fund
<b>JICA</b>	Japan International Cooperation Agency
<b>JIRCAS</b>	Japan International Research Center for Agricultural Sciences
<b>JTED</b>	Juvenile and Trash Excluder Devices
<b>JTF</b>	Japanese Trust Fund
<b>MAC</b>	Marine Aquaculture Centre
<b>MCS</b>	Monitoring, Control and Surveillance
<b>MFRD</b>	SEAFDEC Marine Fisheries Research Department
<b>MFRDMD</b>	SEAFDEC Marine Fishery Resources Development and Management Department
<b>MRC</b>	Mekong River Commission
<b>MSY</b>	Maximum Sustainable Yield
<b>NACA</b>	Network of Aquaculture Centres in Asia-Pacific
<b>PCM</b>	SEAFDEC Program Committee Meeting
<b>PIPO</b>	Port-In Port-Out
<b>PSM</b>	Port State Measures
<b>PSMA</b>	Port State Measures Agreement
<b>RFMOs</b>	Regional Fisheries Management Organizations
<b>RFPN</b>	Regional Fisheries Policy Network
<b>RFVR</b>	Regional Fishing Vessels Record (for fishing vessels 24 meters in length and over)



<b>RIHN</b>	Research Institute for Humanity and Nature, Japan
<b>RPOA</b>	Regional Plan of Action
<b>RS</b>	Remote Sensing
<b>RTC</b>	Regional Technical Consultation
<b>SEAFDEC</b>	Southeast Asian Fisheries Development Center
<b>SDGs</b>	Sustainable Development Goals
<b>SFA</b>	Singapore Food Agency
<b>SOM-AMAF</b>	Senior Officials Meeting of the ASEAN Ministers on Agriculture and Forestry
<b>SwAM</b>	The Swedish Agency for Marine and Water Management
<b>TAC</b>	Total Allowable Catch
<b>TAE</b>	Total Allowable Effort
<b>TiLV</b>	Tilapia Lake Virus
<b>TD</b>	SEAFDEC Training Department
<b>UNEP</b>	United Nations Environment Programme
<b>USAID</b>	U.S. Agency for International Development
<b>US-DOI</b>	U.S. Department of Interior
<b>VMS</b>	Vessel Monitoring System
<b>WCPFC</b>	Western and Central Pacific Fisheries Commission

## REPORT OF THE FORTY-FIRST MEETING OF THE PROGRAM COMMITTEE OF THE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

Langkawi, Malaysia  
5-7 November 2018

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### I. INTRODUCTION

1. The Forty-first Meeting of the Program Committee (41PCM) of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Langkawi, Malaysia from 5 to 7 November 2018 and hosted by the Marine Fishery Resources Development and Management Department (MFRDMD).
2. The 41PCM 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 the collaborating partners of SEAFDEC namely: the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO); Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF); Gifu Prefectural Inland Fisheries Training Center in Japan; Sweden Embassy in Bangkok; and the Swedish Agency for Marine and Water Management (SwAM); observers from the National Fisheries Authority of Papua New Guinea and the USAID Oceans; 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**.

### II. OPENING OF THE MEETING

3. The Director General of the Department of Fisheries Malaysia and SEAFDEC Council Director for Malaysia, *Dato' Haji Munir bin Haji Mohd Naw*i expressed his pleasure to welcome the SEAFDEC Program Committee Members and their delegates as well as other guests to Langkawi, Malaysia. He congratulated SEAFDEC for its successes in the implementation of programs, projects, and activities based on the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020. While emphasizing on the 2030 Agenda and the Sustainable Development Goals (SDG), he reiterated that with the collaboration of its partner organizations, SEAFDEC should continue to play the role as cornerstone in assisting the Member Countries to implement SDG14: Conserve and Sustainably Use of Oceans, Seas and Marine Resources for Sustainable Development. In addition, he encouraged SEAFDEC to intensify its efforts in facilitating the conduct of capacity building activities, especially in areas of critical importance to the Southeast Asian region, and more particularly on fish stock assessment, post-harvest loss and waste assessment. His Welcome Remarks appears as **Annex 2**
4. The Secretary-General of SEAFDEC, *Dr. Kom Silapajarn* in his capacity as Chairperson of the Program Committee, welcomed the participants and observers to the Meeting, and expressed the condolences of SEAFDEC to the people of Indonesia who have been affected by the destruction brought about by the *tsunami* in Sulawesi in September 2018. He continued by explaining that starting with this Forty-first Meeting of the SEAFDEC Program Committee, the discussion would be guided by the SEAFDEC Strategies Towards 2030 prescribed in the Resolution on the Future of SEAFDEC (RES-2017) adopted during the Special SEAFDEC Council Meeting in 2017. He added that based on the directive of the SEAFDEC Council during its Fiftieth Meeting in March 2018, the projects implemented by SEAFDEC under the Fisheries Consultative Group on ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism have been harmonized and aligned under the said SEAFDEC Strategies. He also specified that as before, the review of implementation of these Programs would start with the programs under the FCG/ASSP Mechanism followed by the Departmental Programs and other programs, and pipeline programs, and reiterated that the outputs of the Meeting together with the 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 through the Twenty-first Meeting of the FCG/ASSP to be held back-to-back with this Program Committee Meeting. After encouraging the Program Committee to closely examine the programs of activities implemented in 2018,

as well as those proposed for 2019 to ensure that these address the concerns and requirements of the region, he declared the Program Committee Meeting open. His Opening Remarks appears as **Annex 3**.

5. Held in conjunction with the Opening Ceremony of the 41PCM was the launching of the book “Marine Fishes and Crustacean of the Southeast Asian Region” recently published by MFRDMD to serve as comprehensive and user-friendly reference in identifying the morphological characteristics of marine fishes and crustaceans found in the Southeast Asian region. Copies of the book were distributed to the participants in the 41PCM.

### **III. ADOPTION OF THE AGENDA AND ARRANGEMENTS OF THE MEETING**

6. The Agenda which appears as **Annex 4** was adopted.

### **IV. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2018 AND PROPOSED PROGRAMS FOR THE YEAR 2019**

7. The Program Committee took note of the twenty-three projects under the FCG/ASSP Mechanism which have been classified under the six (6) SEAFDEC Strategies, and two Special Projects. The Program Committee then reviewed the progress and achievements of the projects in 2018 and the programs of activity for 2019, as reported by the SEAFDEC Secretariat and Departments. The results of the review process as well as the recommendations of the Program Committee will be submitted for endorsement to the higher authorities of the ASEAN and SEAFDEC.

#### **4.1 Programs under the FCG/ASSP Mechanism**

8. The Program Committee noted the progress and achievements of the programs implemented by the SEAFDEC Secretariat and the Departments in 2018 as well as the activities proposed for 2019 under the FCG/ASSP Mechanism (**Annex 5**). The Program Committee provided recommendations for the improvement of the programs’ projects and activities, as follows:

#### **4.1.1 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. While commending TD for implementing the project Human Resource Development for Sustainable Fisheries, the Program Committee Member for Indonesia reiterated the recommendation made during the Fortieth Meeting of the Program Committee in 2017 on the need to develop the key performance indicators (KPIs) of each project to facilitate the monitoring and review of the progress of implementation. In response, the Secretary-General of SEAFDEC explained that the KPIs of each project would be developed for the new SEAFDEC projects starting with the Japanese Trust Fund 7 (JTF7), and that this particular project is already in its final stage of implementation until 2019.

10. The Program Committee Member for Thailand also noted the successful implementation of this project, and requested TD to consider in the future, the possibility of supporting the introduction of Ecosystem Approach to Fisheries Management (EAFM) concept in three sites in Thailand; two for inland and one for coastal areas.

11. The Program Committee Member for Myanmar expressed the appreciation to TD and the Japanese Trust Fund (JTF) for extending the implementation of the project activities in Myanmar. While expressing the view that the promotion of EAFM has close linkage with some other projects in Myanmar, *e.g.* those on climate change adaptation supported by FAO, he requested TD to consider supporting a similar initiative at a new pilot site in Kaw Thaug, Myanmar.

12. The Program Committee Member for Lao PDR commended TD for the implementation of this project as it has enhanced the capacity of local officers and the communities in Lao PDR on the EAFM

concept. As for the proposed activities in 2019, he expressed the commitment of Lao PDR to continue its close collaboration and coordination with TD.

13. While appreciating TD for implementing the activities in Cambodia, the Program Committee Member for Cambodia requested TD to consider extending the future activities in Tonle Sap Lake of Cambodia.

14. The Program Committee Member for the Philippines extolled SEAFDEC for the initiatives undertaken under this project as these had supported the mainstreaming of the EAFM concept in the country's fisheries plans and programs. While considering that several pilot sites are already applying the EAFM concept, he suggested that sharing of lessons learnt from the different pilot sites should be encouraged. Moreover, he also supported the comment made by Program Committee Member for Indonesia that KPIs for each project should be developed, especially for this project, to facilitate the review of the progress of implementation in the future.

15. To facilitate the sharing of relevant lessons gained from the pilot sites, the JTF Manager explained that TD would organize a workshop in October 2019 which is meant to serve as platform for the presentation of outputs from the implementation of EAFM concept in different project sites as well as similar initiatives undertaken with collaborating partners, *e.g.* NOAA, USAID. He expressed the hope that countries not currently serving as pilot sites could gain lessons from the experiences shared, and that similar initiatives could be considered under the JTF programs in the future.

16. The representative from the BOBP-IGO expressed the view that although the EAFM is very good concept, its implementation would be difficult to undertake when a good governance system is not in place in the receiving countries. In this regard, he suggested that the EAFM concept should be mainstreamed into the respective national agenda of the ASEAN Member States (AMSs).

17. The representative from CTI-CFF shared the view that EAFM is also one of the fisheries management strategies adopted by the CTI-CFF. In this regard, he looked forward to strengthening the collaboration between CTI-CFF and SEAFDEC to enhance the implementation of capacity building activities on this concept.

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

18. While expressing the appreciation to TD for conducting several training courses under this project, the Program Committee Member for Viet Nam reiterated that although Viet Nam had already scheduled to conduct a pilot demonstration for improving fish handling onboard tuna purse seiners in 2018, and that the fisher-participants for such pilot demonstration had been selected, the activity had to be postponed due to some technical constraints. In this regard, she requested TD to conduct such pilot demonstration activity in 2019 in Bin Dinh Province, Viet Nam.

19. Although the Program Committee Member for Thailand expressed the willingness of Thailand to cooperate with TD in the implementation of this project, she raised some concerns about the design of the new trawler, the proportion of crew members onboard that would be reduced, and the cost of the fishing vessel modification. In response, it was clarified that approximately eight crew members could be reduced and that the new design is not intended for vessel modification, but for the construction of a new vessel. At this stage therefore, the cost of constructing a new vessel could not be estimated as this is subject to several factors and specifications.

20. The Program Committee Member for the Philippines commended TD for the implementation of this project, and sought clarification as to whether SEAFDEC has other aspects of work related to the improvement of technologies that would facilitate compliance with the requirements for exportation of fishery products to the US. In response, it was explained that TD is also undertaking activities on the development of fishing technologies that could address such concern, *e.g.* improving of the design of new otter-board fishing vessel to reduce energy consumption.

21. The Program Committee Member for Indonesia emphasized on the need to investigate the significant outcomes of the project implementation using measurable indicators to be able to compare the situation before and after the project implementation.

22. The representative from BOBP-IGO supported the suggestions that SEAFDEC should continue its activities that emphasize on promoting energy efficiency of fishing vessels.

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

23. The Chief of AQD commended TD for pursuing this project and shared the view that in enhancing the fishery resources, there should be a balance between capture fisheries and resource conservation. In this connection, he suggested that aquaculture could be engaged to enhance the production of the species for conservation, such as in producing multi-species seeds for stock enhancement in natural habitats.

24. While emphasizing the importance of Fish Aggregating Devices (FADs) and Fish Enhancing Devices (FEDs) in enhancing fish biomass, the Chief of MFRDMD suggested that TD should consider incorporating in the project the development of effective FADs and FEDs, as well as formulating standard procedures for assessing the abundance of the resources prior to and after the deployment of FADs and FEDs.

25. In response to the comment of AQD and MFRDMD, the JTF Manager informed the Program Committee that the JTF would continue the activities under this project in collaboration with relevant SEAFDEC Departments including AQD, and that in 2019 the JTF is planning to undertake a biological evaluation on the effectiveness of the resource enhancement measures, and to come up with the standard procedures as suggested by MFRDMD.

26. The Program Committee Member for Thailand shared the experience of Thailand in the installation of FEDs using used tires since such materials release toxic substance to the environment, and that there are other aspects that should also be considered, *e.g.* the need for management and maintenance of FEDs. She suggested that other biodegradable plastics as alternative materials for FEDs could be used instead. In this connection, the representative from the SEAFDEC Secretariat also expressed the concern that the use of biodegradable materials such as plastics could also pose risks as these could comprise the source of microplastics in the oceans.

27. While acknowledging the benefits of the current activity on crab bank in Kep Province, the Program Committee Member for Cambodia proposed the possibility of extending the activities to other sites in Cambodia, *i.e.* Kampot Province, provided that funds are available. Otherwise, SEAFDEC could consider providing Cambodia with the awareness raising materials to be disseminated in the landing sites of the country's four coastal provinces.

28. While expressing the interest of Malaysia on hilsa species, the Program Committee Member for Malaysia inquired about the planned workshop/expert consultation on hilsa resources to be conducted for Myanmar and Thailand. He therefore proposed that Malaysia could also be invited to take part in such workshop as observer.

29. The Program Committee Member for Indonesia requested SEAFDEC to consider conducting a workshop to introduce FEDs in Indonesia in 2019 as part of this project's activities.

30. The Program Committee Member for the Philippines suggested that the project should come up with a basic model on sustainable resource enhancement that would also include aquaculture to guide the communities in making their own fisheries management programs.

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

31. The Chief of IFRDMD informed the Program Committee that during the implementation of this project, the "Workshop on Regional Awareness Raising in Asia on Prospective Species Proposals to

CITES CoP18 and Preparation of Fisheries Related Information to Support Review of Species Proposals against CITES Listing Criteria” was organized by IFRDMD on 25-28 October 2018 in Palembang, Indonesia with support from FAO. The Workshop had enhanced the understanding of the countries on the roles of the FAO Expert Advisory Panel in the assessment of proposals to amend the CITES Appendices, and discussed the effective measures for monitoring the stocks of eels as well as sharing of lessons learned with regards to eel species from other regions.

32. In response to the query of the representative from BOBP-IGO about the current status of eel stock assessment, the representative from IFRDMD stated that the project has collected information on the present situation of tropical eel fisheries and formulated a system for data collection. However, some difficulties were encountered in carrying out the stock assessment due to data limitations, particularly considering that different countries in the region are catching the different stages of eels.

33. The Program Committee Member for Indonesia informed the Program Committee that exploitation of eels in Indonesia has become higher. He recommended that there is a need to develop guidelines to raise the awareness of local people about the importance of glass eels and that biological studies should be conducted for the conservation of the eel resources.

34. The representative from the SEAFDEC Secretariat added that since stock assessment would require time series data, further discussion would be necessary to consider the possibility of adopting other appropriate stock assessment models where data although very limited, could be used, *i.e.* making use of data compiled only during the past few years.

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

35. The Program Committee took note of the plan of IFRDMD to publish under this project the book “Features of Inland Fisheries in Southeast Asia” in 2019, and the declaration that IFRDMD would continue to exert efforts to link this project with other relevant programs of IFRDMD considering that promotion of inland capture fisheries is the core work of IFRDMD. To further its initiatives on inland capture fisheries, IFRDMD also informed the Program Committee that a project proposal on the development of GIS mapping application is being prepared to support inland fishery resources management.

36. The Program Committee Member for Thailand expressed the appreciation to IFRDMD for its assistance in promoting increased awareness on the management of inland capture fisheries which is an important sub-sector for the Southeast Asian region. She also conveyed the support of Thailand to this project, particularly in making use of the fisheries data collected from the field to support management, and looked forward to seeing the results of this project and participating in the implementation of the project.

#### **(6) Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management**

37. While informing the Program Committee that this project which was supported by IDB would be completed before the end of 2018, MFRDMD expressed the appreciation to the Governments of Brunei Darussalam, Indonesia, and Malaysia for the cooperation extended to the project that allows the project to come up with successful results. The Program Committee was also informed that MFRDMD intends to continue this similar initiative in other Member Countries, *e.g.* Cambodia, Philippines, Thailand, and Viet Nam with possible funding support from Japan-ASEAN Integration Fund (JAIF).

38. The Program Committee for the Philippines commended MFRDMD for the tangible and quantifiable results from this project, which correspond to its output objectives.

#### **(7) Promotion of Countermeasures to Reduce IUU Fishing Activities**

39. While commending SEAFDEC for sustaining the implementation of this project and expressing the view that development of regional tools to combat IUU fishing is necessary, the Program Committee

Member for Indonesia supported the extension of the project after its completion in 2019. He also proposed that the future activities on combating IUU fishing for consideration by SEAFDEC, could include: 1) capacity building on fisheries surveillance to combat IUU fishing; and 2) regional capacity building on investigation and inspection techniques, and fisheries law enforcement to combat IUU fishing.

40. The Program Committee Member for Viet Nam concurred with the view of the Program Committee Member for Indonesia that regional tools are necessary to combat IUU fishing, and suggested that in addition to the extension of the implementation of the project, the project scale and contents should also be expanded. Nevertheless, on the possibility of expanding the RFVR to also cover vessels less than 24 meters in length, she expressed the view that the consensus among the Member Countries should be sought on the size/scale of vessels to be included. She added that the Regional Technical Consultation (RTC) on International Fisheries-related Issues convened in Bangkok, Thailand in June 2018 discussed this matter and viewed that the RFVR should be linked with and serve as inputs to the FAO Global Record of Fishing Vessels, Refrigerated Transport Vessels and Supply Vessels (Global Record). With regards to the PSMA which has already been ratified by some Member Countries, she expressed the view that although training on vessel inspection is important, establishment of a network for sharing information/common measures on the implementation of the Port State Measures Agreement (PSMA) among the countries in the region is also necessary. She therefore proposed that TD should consider establishing in the future, a mechanism to facilitate communication and exchange of information on the status of implementation of the PSMA among the AMSs.

41. The Program Committee for Thailand expressed the concern on the different protocols for vessel inspection at sea applied by different RFMOs, and requested SEAFDEC to consider the possibility of organizing a consultation among experts in the region to develop a harmonized protocol for vessel inspection at sea especially in areas beyond the national jurisdictions.

42. In response to the request made by the Program Committee Member for Thailand, the Program Committee Member for Japan informed the Meeting that the United Nations Fish Stock Agreement provides the general frameworks for vessel inspection at sea, and for each RFMO to conduct their own inspection procedures. He also suggested that the SEAFDEC Secretariat could consider contacting the concerned RFMOs to obtain information on their respective procedures. He emphasized that although monitoring of fishing activities in the high seas is important, monitoring of catch from EEZs should be also emphasized as the majority of the catch is derived from the EEZs.

43. The Program Committee Member for Japan also stated that FAO has already developed the Global Record which is now available at FAO's website. Furthermore, as the PSMA includes provisions for contracting Parties to share information on IUU fishing activities, FAO would also develop the IUU fishing vessel list under the Global Record. He therefore suggested that SEAFDEC Secretariat should consider communicating with FAO to request for the updated information on the Global Record.

44. The Program Committee Member for Malaysia expressed his concern on the plan of TD to expand the RFVR to also cover vessels less than 24 meters in length given the current challenges in updating the data. In the mean time therefore, TD should focus on vessels 24 meters in length and over. In addition, he suggested that TD should conduct training on vessel inspection but considering budget limitations, such training could be in the form of Training of Trainers (TOT). Furthermore, in the light of combating IUU fishing, he suggested that TD should consider to include in its future programs, the training of observers onboard.

45. With regards to the future plan on the RFVR, the JTF Manager informed the Meeting that SEAFDEC is planning to organize 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 in December 2018. It is expected that issues on the development of the record for vessels below 24 meters in length and the actions to be taken in 2019 would be discussed during such regional meeting.

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

46. The Program Committee Member for Thailand congratulated TD for pursuing this project and provided an update on the project implementation in Thailand, the project sites of which have already been identified, *i.e.* in Trat Province focusing on Indo-Pacific mackerels; and in Ao Ban Don, Samui, Surat Thani Province for blue swimming crab. She added that the activities under this project have been implemented according to the timeline in the workplan.

**(9) Offshore Fisheries Resources Exploration in Southeast Asia**

47. While commending TD for carrying out activities on the stock assessment of migratory species under this project, the representative from the BOBP-IGO suggested that TD could consider consulting with relevant RFMOs to ensure that the said activities complement with those of the concerned RFMOs. He also shared the experience of the BOBP-IGO on stock assessment of yellowfin tuna in the Indian Ocean, as well as the concern that when a country wants to expand the fishing area, the relevant RFMOs would still regulate the activities in such fishing area.

48. The Program Committee Member for Thailand requested TD to consider involving Thailand in the activity on tuna stock assessment in Sulu-Sulawesi Sea, and to expand its training course to include growth analysis based on otolith samples.

49. The representative from SEAFDEC Secretariat reiterated that SEAFDEC is avoiding the duplication of works with any RFMOs, especially with the IOTC and WCPFC. In this connection, when there is technical collaboration between SEAFDEC and particular RFMOs, SEAFDEC would check with such concerned RFMOs on their activities related to tuna stock assessment to ensure that the SEAFDEC initiatives would support rather than duplicate the work of such RFMO.

50. The Program Committee Member for the Philippines suggested that reporting of this project at future Program Committee Meetings should also include brief results from the activity as this would be useful in the discussion of the future workplan. He suggested that SEAFDEC should also consider continuing the stock assessment of tuna in Sulu-Sulawesi Sea, the results of which could be conveyed to WCPFC for reference.

51. The Program Committee Member for Cambodia expressed the appreciation to SEAFDEC for conducting fishery resources survey in Cambodia using the M.V. SEAFDEC 2, and requested SEAFDEC to assist in strengthening the capacity of fishery officers in analyzing the data and finalizing the results of the survey.

52. The representative from CTI-CFF informed the Meeting that Sulu-Sulawesi Sea is one of the priority seascapes of CTI-CFF, and that CTI-CFF has recently completed the project under the German Corporation for International Cooperation (GIZ) in Sulu-Sulawesi Sea with activities that are in synergy with those undertaken by SEAFDEC. He therefore suggested that results of the works undertaken by SEAFDEC and CTI-CFF in this particular area should be exchanged and disseminated.

53. The Program Committee Member for Thailand shared the experience of Thailand regarding the FAO survey of the Andaman Sea using the R.V. Fridtjof Nansen, which was participated also other countries, such as Myanmar, Sri Lanka, India, and Bangladesh. In this connection, the SEAFDEC Secretary-General informed the Program Committee that other countries in the region could also request for the use of the R.V. Fridtjof Nansen in conducting marine research surveys in their respective waters.

54. The Chief of MFRDMD proposed that this project could also include modernization of fishing vessels for the sustainability of the fishery resources.



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

55. The Program Committee noted the progress of the project activities to improve data collection on sharks and rays in the region which had been undertaken as collaborative efforts between TD and MFRDMD, and was also informed that the data collected under this project is from the landings only.

56. While expressing the appreciation to TD for its plan to conduct the “Regional Workshop on Improvement of Fisheries Information Collection in Small-scale Coastal and Inland Fisheries in the Southeast Asian Region” in 2019, the Program Committee Member for Myanmar sought clarification on how the country participants would be able to cover the subjects on coastal and inland small-scale fisheries data collection at the same time. In response, the representative from TD clarified that the collection of fisheries data either from inland or coastal fisheries is similar due to the nature of small-scale fisheries, and thus, a similar concept of community-based fisheries management has also been promoted through this project.

57. The Program Committee Member for Lao PDR appreciated the initiative of SEAFDEC in selecting Lao PDR as one of the project’s pilot sites. He also expressed the commitment of Lao PDR to support the project’s proposed activities in 2019.

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

58. With regards to the outputs of the project which are useful for fisheries management in the region, the Program Committee Member for the Philippines supported the suggestion of IFRDMD that the stock boundaries of the target species should be delineated and the genetic markers should also be determined. However, he also added that there are more important small pelagic species that should be studied as well as reference points towards and harvest control rules to be established, for these transboundary stocks. As a way forward, he suggested that the biology of other important species such as round scads, neritic tunas, and sardines should also be studied. However, the current capacities of the countries should be enhanced in determining the necessary reference points.

59. The Program Committee Member for Thailand also supported the view expressed by IFRDMD and the Program Committee Member for the Philippines. While sharing information on the initiatives of Thailand in using the Maximum Sustainable Yield (MSY) and Total Allowable Effort (TAE) for the management of purse seine fisheries, she also informed the Program Committee that Thailand is planning to apply Total Allowable Catch (TAC) in the future. In this connection, she suggested that in the future plan of the project, assistance to be provided to the countries in the analysis of the appropriate MSY and TAE of the targeted species should also be considered.

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

60. The Program Committee was informed by the representative from MFRDMD that this project focuses on enhancing the capacity of the Member Countries on species identification of sharks and rays, which is supportive to the other projects such as the SEAFDEC-EU/CITES Sharks Project which deals with the improvement of data collection of sharks and rays.

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

61. The Program Committee took note of the progress of implementation of the project as presented by the representative from the SEAFDEC Secretariat.

**(14) SEAFDEC-EU/CITES Sharks Project Phase II**

62. The Program Committee took note of the progress of implementation of the project SEAFDEC-EU/CITES Sharks Project Phase II as presented by the representative from the SEAFDEC Secretariat.

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

63. The Program Committee was informed that this project would be implemented starting 2019 with support from the Japan-ASEAN Integration Fund (JAIF), and that the experiences gained from the implementation of this project would be shared after its completion, with the SEAFDEC Member Countries.

64. On the species that would be targeted under this project, the representative from the SEAFDEC Secretariat explained that the project would collect the geographical and environmental data from satellites, which would be mapped with catch data gathered from the inland fishing grounds. Therefore, there is no pre-defined target species in the project plan.

65. Considering that the pilot sites for this project are Cambodia, Indonesia, Lao PDR, and Thailand, the Program Committee Member for Malaysia inquired whether the project could be expanded or replicated in other countries in the future. In response, the representative from the SEAFDEC Secretariat indicated that the activities would not be extended to other sites. However, if 10-year time series satellite data could be made available and if data on catch by areas could be provided by the interested countries, the project could assist in determining the relationship between the catch data and environmental data. Nevertheless, the planned regional workshop on catch analysis using GIS Mapping/RS Technology would involve all the AMSs.

**4.1.2 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**

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

66. The Program Committee noted the progress of implementation of the project Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources as presented by the Chief of AQD.

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

67. Considering that the project is scheduled to be completed in 2019, the Program Committee Member for Thailand expressed the country's interest in participating in Activity 5: Technology Extension and Demonstration considering that Thailand has large-scale aquaculture industry.

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

**(18) 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**

68. While commending MFRD for pursuing this project, the Program Committee Member for Thailand sought the cooperation of SEAFDEC in sustaining this project and suggested that future project activities could include harmonization of the techniques for detecting and analyzing biotoxins from harmful algal blooms (HABs) in the region, and development of the necessary reference points. In response, MFRD indicated that these concerns could be discussed during the end-of-project meeting.

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

##### **(19) Cold Chain Management for Seafood**

69. The Program Committee took note of the progress and achievement of the project on the Cold Chain Management for Seafood. The Program Committee Member for Singapore also reported that the draft Guidelines on Cold Chain Management of Seafood would be submitted to the forthcoming Meeting of the FCG/ASSP for support, and subsequently, to the next SEAFDEC Council Meeting for endorsement.

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

70. With regards to the implementation of this project, the Program Committee Member for Indonesia expressed the view that since trading of fish and fishery products is dynamic, the real picture would be difficult to establish. He therefore reiterated the request made by the Program Committee Member for Indonesia in 2017 for SEAFDEC to update and synthesize the relevant information on international fish trade once a year and put up a link in the SEAFDEC website for information (*e.g.* price). In response, the representative from the SEAFDEC Secretariat explained that link to the information on requirement of important markets, has already been put up in the SEAFDEC website. Moreover, the Regional Fisheries Policy Network (RFPN) Members have been tasked to compile the information on international fish trade of their respective countries, the report of which would be uploaded on the SEAFDEC website by the end of 2018.

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

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

71. The Program Committee Member for Myanmar expressed the appreciation to SEAFDEC for considering the proposal of Myanmar under this project and for organizing the introductory workshop on eACDS in Myanmar in 2018 as it helped in enhancing the capacity of the stakeholders on the concept and utilization of the eACDS.

72. The Program Committee Member for Malaysia acknowledged the effort of SEAFDEC in coordinating with the Department of Fisheries Malaysia for the conduct of the introductory workshop on eACDS in Malaysia in 2018, in response to the request made during the Fortieth Meeting of the SEAFDEC Program Committee in 2017. Moreover, the Program Committee Member for Malaysia also requested that Malaysia could be included as one of the project sites in 2019.

73. In response to the query of the Program Committee Member for Indonesia regarding the inclusion of fish trade related issues in the SEAFDEC website, the representative from the SEAFDEC Secretariat assured the Program Committee that information on fish trade-related issues in the SEAFDEC website will be updated regularly.

74. While noting that the eACDS has already been introduced and implemented in some SEAFDEC Member Countries, the Program Committee Member for the Philippines emphasized that the eACDS should not target only commercial fisheries, but also the small-scale fisheries as this is a very important sub-sector for the region.

75. The representative from BOBP-IGO requested SEAFDEC to share with the member countries of the Bay of Bengal (BOB) region the relevant documents including the requirements for eACDS to address trade related issues. He also shared the experience of the BOB region regarding the several trade barriers that have been emerging resulting in the increasing number of requests for BOBP-IGO to keep the stakeholders aware of such emerging trade barriers, and on the need to extend support for the countries to move further in response to such requirements which has become imperative. Considering that the same

situation could also be happening in the Southeast Asian region, he suggested that assistance to the concerned countries should be extended to enable them to cope with the requirements for traceability of their fish and fishery products, and to address such requirements.

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

##### **(22) Fisheries Resource Survey and Operational Plan for the M.V. SEAFDEC 2**

76. The Program Committee took note of the progress in the implementation of fishery resources surveys using the M.V. SEAFDEC 2 in 2018, and was also informed on the scheduled maintenance and upgrading of equipment onboard the M.V. SEAFDEC 2 during January-February 2019 which is being supported by Japan International Cooperation Agency (JICA).

77. With regards to the implementation of the project in 2019, the Program Committee Member for Viet Nam proposed to make use of the M.V. SEAFDEC 2 in the conduct of a survey of marine fisheries in Viet Nam for a period of two months from June to August 2019.

78. The Program Committee Member for Thailand also informed the Program Committee that Thailand is planning to conduct a training course on marine resources survey onboard a Thai research vessel in 2019. In this connection, she requested TD for the services of its resource persons to support the conduct of such training course and added that the details of such request would be submitted to SEAFDEC in due course.

79. In addition, the Program Committee Member for Malaysia also requested for the use of the M.V. SEAFDEC 2 for its mid-water trawl survey in Malaysian waters in 2019, the timeframe and budget of which would be subsequently communicated with TD.

##### **(23) Strengthening SEAFDEC Network for Sustainable Fisheries**

80. While expressing the appreciation to SEAFDEC for supporting Cambodia in the development of the country's database on marine fishing vessels through this project, the Program Committee Member for Cambodia informed the Program Committee that a census of the Cambodia's marine fishing vessels had been conducted, and that the units of the capacities of the vessels are being reclassified from horsepower (HP) to length class. SEAFDEC was therefore requested to extend assistance to Cambodia on the modification of its existing database system to accommodate the changes in vessels' classification. He also informed the Program Committee that Cambodia would start keying in the information on the country's licensed fishing vessels into the database in 2019.

81. The Program Committee Member for Lao PDR thanked SEAFDEC for sustaining the Regional Fisheries Policy Network (RFPN) and requested SEAFDEC to consider the possibility of continuing the project in 2019. He also emphasized the importance of dispatching the respective RFPN Members by the Member Countries to be stationed at the Secretariat, as this would not only strengthen human resource development but also enhance the cooperation among the countries as well as the communication channel between the respective countries' fisheries agencies and SEAFDEC.

82. With regards to the designation status of the RFPN Members, it was clarified that while this project through the JTF supports the RFPN Members for Cambodia, Lao PDR, and Viet Nam; the other RFPN Members for Indonesia, Malaysia, Myanmar, Philippines, and Thailand are being supported by the SEAFDEC-Sweden Project.

83. While appreciating the progress of implementation of this project, especially its role in the establishment of a regional and/or sub-regional mechanism to address several fisheries-related issues, the Program Committee Member for Viet Nam expressed the concern on the need to sustain such mechanism after the completion of the project in 2019.

84. The representative from BOBP-IGO shared the information that member countries of the BOBP-IGO appreciated the need for the establishment of a sub-regional network mechanism. However, the issue about the long-term existence of this network after the completion of relevant project supporting the mechanism, needs to be carefully considered.

#### **4.1.7 Special Projects**

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

85. The Program Committee took note of the significant achievements that were realized from the activities supported by the SEAFDEC-Sweden Project, particularly the Regional Plan of Action for the Management of Fishing Capacity (RPOA-Capacity), the RPOA for Sustainable Utilization of Neritic Tunas in the ASEAN Region (RPOA-Neritic Tunas), the ASEAN Catch Documentation Scheme, and the establishment of sub-regional cooperation and bilateral dialogues among countries in the region toward sustainable development and management of fisheries.

86. The Program Committee for Myanmar expressed the appreciation to the SEAFDEC-Sweden Project for extending support to several activities, especially the sub-regional cooperation for management of transboundary species, combating IUU fishing, and establishment of Monitoring, Control and Surveillance (MCS) networks. He also expressed the view that SEAFDEC should request the Government of Sweden for the possible extension of the project after its completion in 2019. While also expressing gratitude for the support extended by the SEAFDEC-Sweden Project on the activities that aim to address gender equity in fisheries, he also requested SEAFDEC to promote the application of the SEAFDEC gender toolkit for Myanmar in 2019.

87. The Program Committee for Lao PDR also expressed the appreciation to the SEAFDEC-Sweden Project for implementing activities in the sub-regional Mekong River Basin that includes previous bilateral dialogues between Lao PDR and Cambodia, and Lao PDR and Thailand; for supporting the Training for Local Government Officers on EAFM and the Training of Trainers on E-EAFM; and for conducting the fishing gear survey in Bokeo Province, Lao PDR. For 2019, he requested SEAFDEC to continue extending its support for the strengthening of transboundary fisheries management in the upper Mekong River Basin between Lao PDR and Thailand, *i.e.* Bo Keo in Lao PDR and Chiang Rai in Thailand.

88. The Program Committee for Thailand thanked the SEAFDEC-Sweden Project for supporting the activities that enhance fisheries management toward sustainability as well as the capacity building for fisheries officers. He expressed the support of Thailand to the request made by the Program Committee for Lao PDR for continued implementation of the activities in areas between Bo Keo and Chiang Rai. He provided a brief background of the cooperation between Thailand and Lao DPR which was initiated by the Mekong River Commission (MRC) and other partners since 2012, and focused on compilation of data on the fishery resources, critical habitats and management measures. However, the project could not be continued due to budgetary constraints, and the restructuring of programs and the organization structure of MRC. He therefore sought support from the SEAFDEC-Sweden Project for the continuation of this activity to enhance the cooperation for the management of transboundary resources between Thailand and Lao PDR in the future.

89. While congratulating the SEAFDEC Secretariat for the sustained implementation of the project, the Program Committee Member for Malaysia also expressed the country's support to the continuation of this project, considering the benefits the region had gained from the promotion of sub-regional cooperation. He reiterated that different sub-regions are facing different issues, and thus specific approaches and attention are necessary to address the issues. With regards to the activities on combating IUU fishing, closer communication among countries could already be realized, especially in the areas where the Project has already provided the platform for bilateral dialogues. He therefore encouraged that the initiative should be continued in the future, possibly through the extension of the support from the Government of Sweden.

90. The Program Committee Member for Viet Nam inquired about the progress of the assessment of neritic tuna resources in the region, particularly on the specific results, collaboration with relevant

RFMOs, as well as the activities to be undertaken in 2019. In response, the representative from the SEAFDEC Secretariat clarified that up to the present, a series of activities have been conducted to build the capacity of the countries' researchers on stock assessment. In 2016-2017, stock assessment and risk assessment were conducted for longtail tuna and kawakawa based on data provided by the countries and the results were reported to the SEAFDEC Council and the ASWGFi Meetings in 2017. The results would also be presented at the IOTC meeting next year. For 2018, the project would continue to provide capacity building for the stock assessment of the Indo-Pacific king mackerel and the narrow-barred Spanish mackerel.

91. Considering that the results from the stock assessment and risk assessment including management recommendations were only noted by the SEAFDEC Council and the ASWGFi, the representative from the SEAFDEC Secretariat expressed the view that further discussion with the ASEAN Secretariat is necessary in order that such results could be submitted to policy makers in the future.

92. In this connection, the Program Committee Member for Thailand expressed the view that several studies have been undertaken such as the stock assessment of neritic tunas, which came up clear results showing the condition of the species, and the management required to ensure the sustainability of the species. She also emphasized that there is no RFMO responsible for neritic tunas in the Gulf of Thailand, while in the Andaman Sea, the management of this species is under the responsibility of the IOTC.

93. The representative from the SEAFDEC Secretariat also informed the Program Committee that IOTC recognizes the works of SEAFDEC on stock assessment and risk assessment for neritic tunas in the Andaman Sea. However, considering that WCPFC seems to have no mandate and interest in coastal and neritic tuna resources, therefore, the work of SEAFDEC would complement the work of IOTC and would not duplicate with any of the stock assessment activities of WCPFC.

94. While reaffirming the importance of the activities on neritic tunas that are transboundary among countries in the region, the Program Committee Member for the Philippines confirmed that neritic tunas are not covered by WCPFC. SEAFDEC should therefore exert effort to sustain the activities on neritic tunas in order to obtain data that could serve as scientific basis towards the sustainable utilization of the species.

95. The SEAFDEC Secretary-General reiterated the recommendation made by the SEAFDEC Council during its 50<sup>th</sup> Meeting in 2018, that the future work of the Scientific Working Group (SWG) for neritic tunas could be expanded to other species that are important for the region, *e.g.* anchovies, mackerels.

## **(25) The Oceans and Fisheries Partnership (USAID Oceans)**

96. The Program Committee Member for Thailand expressed the appreciation to the USAID Oceans for implementing activities in pilot learning sites in the Philippines and Indonesia, and requested the USAID Oceans to suggest appropriate channel for sharing of information particularly on the progress of works in these sites so that the developed technologies could be adopted by other countries. With regards to the expansion site in Songkhla Province, Thailand, he reported that one multi-stakeholder workshop was organized in August 2018 which came up with fruitful results, and expressed the concern that there was no further activity afterwards. He reiterated the request made by Thailand during the last ASWGFi and the Oceans Technical Working Group (TWG) meeting in 2018 on how the information collected from the learning sites could be shared and how the activities in the expansion sites in Thailand could move forward. Furthermore, he also requested the USAID Oceans to provide information on the exact schedule and detailed workplan in support of expansion I and II sites as indicated in the 2019 project workplan.

97. In response to the comment made by Thailand, the representative from the USAID Oceans clarified that the TWG meeting is the main forum for sharing of information on the progress of works. However, the project looks forward to discussing and sharing the information with Thailand. On the query about the expansion site in Thailand, the workplan of 2019 is currently being reviewed by the US Government, and once approved, the country will be informed on the schedule and detailed plans. Moreover, he also stated that reports of the workshops organized in Malaysia and Viet Nam are still being reviewed by the US Government and will be made available in December 2018.

98. The Program Committee Member for Malaysia also expressed the appreciation to the USAID Oceans for conducting a validation workshop on the gap analysis on catch documentation on 8 October 2018 in Malaysia and is now waiting for the final report from USAID Oceans.

## 4.2 Departmental Programs

99. While considering the progress and achievements attained from the implementation of the SEAFDEC Departmental Programs in 2018 and the proposed programs for 2019 (**Annex 6**), the Program Committee offered recommendations for the improvement of the programs and endorsed the proposed programs taking into consideration the following recommendations.

### 4.2.1 Aquaculture Department

100. The Program Committee 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) Adaptation to Climate Change; 4) Maintaining Environmental Integrity through Responsible Aquaculture; 5) Meeting Social and Economic Challenges in Aquaculture; and 6) Priority and Special Projects.

101. The Program Committee Member for the Philippines extended the appreciation for the services rendered by AQD in the country's aquaculture programs. Subsequently, he suggested that AQD could continue sharing of the relevant information and technologies to the SEAFDEC Member Countries.

102. During the discussion, the Program Committee Member for Thailand shared the information that the use of probiotics has been introduced and applied in the industry for the prevention of EMS/APHND, not only in hatcheries but also in culture ponds. Furthermore, in the management of water quality for continuous reduction of organic matter to moderate level, the use of this clear water technique proved to be one of the key factors for the success of marine shrimp culture in Thailand. For the research on the effect of climate change on shrimp culture, the results showed that high water temperature reduced shrimp growth and the stocks require more oxygen consumption, and also impacted on the fluctuation of the feed consumed. She therefore recommended that farmers should apply appropriate feeding management during the period when the temperature is high.

103. The Program Committee Member for Malaysia also stated that several programs on aquaculture have been implemented in Malaysia, including 1) broodstock development especially focusing on grouper, 2) improvement of quality of seaweeds, *e.g.* *Kappaphycus* spp., 3) improvement of tiger shrimp production, 4) finding alternatives to fish meal, and 5) control of Tilapia Lake Virus (TiLV) in tilapia species. In this connection, the Chief of AQD explained that in the improvement of the quality of seaweeds, AQD makes use of tissue culture. For the hybrid grouper, its production entails high operating cost, and on aquatic feeds, these have been produced making use of locally available ingredients to reduce the production costs. Nonetheless, the Chief of AQD expressed the willingness to collaborate with Malaysia, upon request on any of these aspects.

104. The Program Committee Member for Myanmar requested AQD to consider sharing the knowledge on aquaculture technology to Member Countries especially on broodstock management of tiger shrimps as well as establishing the mechanism for sharing information with other AMSs. He also informed the Program Committee that Myanmar has established bilateral agreement with the Philippines and has approached AQD for aquaculture research and development. In this regard, the Chief of AQD reiterated that AQD is proposing the reinstatement of ADSEA (Aquaculture Development for Southeast Asia) as a forum for sharing of information on aquaculture technologies and identifying the strategies for sustainable and responsible aquaculture in the Southeast Asian region.

105. While commending the progress of the project implementation made by AQD, the Program Committee Member for Indonesia shared the views on the development of broodstock technology and suggested that AQD could consider including in its future studies, the culture of ornamental fish species, *e.g.* koi carp, especially for the benefit of countries that import broodstock from Japan. With regards to the seaweed industry, he stated that Indonesia exports seaweeds to the Philippines and China. In this

connection, SEAFDEC was requested to consider supporting the activities related to increasing the value added to products that make use of seaweeds as raw materials.

#### **4.2.2 Training Department**

106. The Program Committee took note of the progress and achievements of the Departmental Programs of TD, namely: 1) Promotion and Strengthening of SEAFDEC Visibility and Image; 2) Tailor-made Training Programs; and 3) Improvement of Fisheries Technology and Reduction of the Impact from Fishing. The Program Committee also noted that henceforth, the program “Promotion and Strengthening of SEAFDEC Visibility and Image” will be merged with the program “Tailor-made Training Programs” and the new program title starting in 2019 would be “Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building.”

107. The Program Committee Member for Cambodia while commending TD for the activities undertaken, raised the concern of Cambodia regarding the practice of some trawlers that continue to use small mesh-size of 1.5 cm, while the legally allowable mesh size is 4.0 cm. Furthermore, he also expressed the concern on the continued use of the rat-tail traps in the coastal areas of Cambodia that catch everything in the waters. He therefore requested TD to allocate funds and assist Cambodia in conducting surveys to investigate the impacts from these gears to the fishery resources.

108. The Program Committee Member for Thailand also requested TD to provide support in the implementation of the project “Promotion of Appropriate Technology and Practices of Fishing and Fishing Gear Engineering in Freshwater Area in Thailand,” of which the proposal would be submitted to TD in due course.

109. The Program Committee Member for Indonesia requested TD for technical support in the conduct of training on safety at sea, *e.g.* basic safety for fishing vessels in accordance with the IMO regulations, as well as training to change the use of fishing gears that had recently become illegal.

110. The Program Committee Member for Malaysia expressed the appreciation to TD for co-organizing the advance fishing gear specialists training on 24-27 September 2018 in Malaysia. He also informed the Program Committee that Malaysia is planning to seek more support from TD in the future, the details of which would be subsequently relayed to TD.

111. The Program Committee Member for the Philippines expressed the appreciation to TD for its efforts in improving fishing gear technologies, and looked forward to seeing the results of the proposed activity in 2019 on the improvement of the technology to enhance the sustainability of marine fishery resources.

112. In response to such requests, the Chief of TD indicated that TD would try to accommodate the requirements of the Member Countries. However, as the funding for the Departmental Programs are derived mainly from the host Government, such requests may be incorporated in the appropriate projects when funding is available.

#### **4.2.3 Marine Fishery Resources Development and Management Department**

113. The Meeting took note of the project proposal under the collaborative research between Japan International Research Center for Agriculture Sciences (JIRCAS) and MFRDMD, as well as the proposed activities for 2019 under such the collaborative research.

#### **4.2.4 Inland Fishery Resources Development and Management Department**

114. The Program Committee was informed of the two Departmental Programs of IFRDMD, namely: 1) Stock Assessment and Fish Production Potential of Inland Fisheries; and 2) Center of Excellence in Science and Technology on Inland Fisheries Management, proposed to be implemented starting 2019.



115. With regards to the project “Stock Assessment and Fish Production Potential of Inland Fisheries,” and while noting that the methodology would involve the mark-recapture method, the Chief of MFRDMD shared his experience that this method needs effective awareness raising so that fishers would be encouraged to report the recaptured marked fish after release. Furthermore, on the use of hydro acoustic research to determine the fish abundance, this method needs sufficient samples to support the echogram verification for estimating the fish abundance considering that differences in species and length of fish will impact on the estimation of the biomass.

116. In response, the Chief of IFRDMD explained that the mark-recapture method was used only for the stock assessment to understand the standing stock instead of the fish migration. In the selected study site, fishes were captured, marked, released, and recaptured using non-selective fishing gear. The mark-recapture method is used in the particular area (floodplains) where the use of hydro-acoustic method is not possible.

#### **4.3 Other Programs**

117. The Program Committee considered and endorsed progress of implementation in 2018 and the corresponding plans for the following programs:

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

118. The Program Committee was informed on the progress of the project implementation in 2018 and proposed activities of this project in 2019 in three countries, namely: Cambodia, Thailand, and Viet Nam (**Annex 7**).

119. While noting that the main activity of this project deals with the construction of a fish passage facility, the Program Committee for Viet Nam inquired about the appropriate working mechanism of this activity, especially on whether this should be placed under the fisheries or irrigation department. In response, it was clarified that this project was undertaken mainly by the US Department of Interior (US-DOI), but TD had been engaged in following-up with respect to the construction and disbursing the payments to local contractors. In undertaking the project activities however, the US-DOI had communicated with the irrigation department and construction company through the US Embassy in the respective countries. Communication between SEAFDEC and the respective fisheries agencies serves only as a channel to keep them informed on the activities.

#### **V. PIPELINE PROJECTS AND EMERGING NEEDS FOR PREPARATION OF FUTURE PROJECT PROPOSALS**

##### **(1) Development of Stock Assessment Method and Strengthening of Resources Management Measures on Tropical Anguillid Eels in ASEAN Region**

120. The Program Committee was informed on the concept note of the pipeline project “Development of Stock Assessment Method and Strengthening of Resources Management Measures on Tropical Anguillid Eels in ASEAN Region” (**Annex 8**), and that the SEAFDEC Secretariat is in the process of seeking support from JAIF for the implementation of this project. The Program Committee was also informed about the objective of this project which is to develop and improve stock assessment methods and resources management measures for securing the sustainable use and conservation of tropical anguillid eels in the ASEAN region.

##### **(2) Second Phase of Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management**

121. The Program Committee was informed that the project “Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management” supported by the Islamic Development Bank (IDB) with specific focus on the Muslim countries of the ASEAN, namely: Brunei Darussalam, Indonesia, and Malaysia, would be completed in 2018. In this connection, MFRDMD has formulated the

proposal for the Phase II of the Project in order to extend the similar initiative to other Member Countries, *e.g.* Cambodia, Philippines, Thailand, and Viet Nam. The said proposal would be submitted for possible funding support from JAIF (**Annex 9**).

122. The representative from the SEAFDEC Secretariat shared the experience in developing project proposals for funding by JAIF including the duration of the project implementation which should be usually 1-2 years, and the proposal should indicate the detailed budget for all planned activities, with clear indicators for evaluation of the activities. Furthermore, submission of the proposal to JAIF requires prior consultation with concerned agencies, *e.g.* the Japanese Government, ASEAN Secretariat, and officer in charge of JAIF.

123. While expressing the appreciation to the SEAFDEC Secretariat for providing such information, the Chief of MFRDMD agreed to improve the proposal including the project duration which should be completed within two years, and work with the SEAFDEC Secretariat on the submission of the proposal to JAIF as well as to other potential donors.

## **VI. COOPERATION WITH DONORS, NON-MEMBER GOVERNMENTS AND INTERNATIONAL/REGIONAL ORGANIZATIONS**

124. The representatives from the collaborating partners of SEAFDEC attending the Program Committee Meeting were invited to inform the Program Committee of their relevant fisheries programs and the potential areas of mutual cooperation with SEAFDEC.

125. The representative from the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), *Dr. Vivekanandan Elayaperumal* thanked SEAFDEC for the invitation extended to BOBP-IGO to participate in the 41PCM. He stated that the mission of SEAFDEC and BOBP-IGO which is to “promote and facilitate concerted actions among their members to ensure the sustainability of fisheries,” is very similar and could be gleaned from their respective programs of activities. For the BOBP-IGO, he informed the Program Committee that its programs include: 1) Regional Programmes on Safety at Sea for Artisanal and Small-scale Fishermen, 2) Regional Programme for Fish Stocks Assessment in the Bay of Bengal, 3) Capacity Building and Information Services for Fisheries Development and Management in the Bay of Bengal Region, 4) Capacity in Preparation of Fishery Performance Indicators, 5) National/Regional Workshops/Conferences on Important Fisheries Issues, and 6) Ocean Partnership Project for Sustainable Fisheries and Biodiversity Conservation-Models for Innovation and Reform. He also reiterated that SEAFDEC and BOBP-IGO could work together to achieve the United Nations Sustainable Development Goals by addressing the SDG 14: Life Below Water. His statement appears as **Annex 10**.

126. The Interim Executive Director of the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF), *Dr. Hendra Yusran Siry* thanked SEAFDEC for giving him the opportunity to speak on behalf of the CTI-CFF Regional Secretariat and the CT6 countries. He recalled that the five-year MOU between SEAFDEC and CTI-CFF signed during the 47th Meeting of the SEAFDEC Council in Thailand in April 2015, deals with the promotion of collaborative works and elimination of overlapping efforts between SEAFDEC and CTI-CFF. He also informed the Program Committee that CTI-CFF is currently developing its second Regional Plan of Action (RPOA 2.0) which emphasizes on the regional actions that would benefit the Coral Triangle (CT) region, and based on the lessons learned from other regional organizations such as SEAFDEC, to expand the effective conservation practices in the CT region. He also expressed the concern on the sustainability of the live reef fish for food trade (LRFFT) which is an unchecked and unregulated industry threatening the poor communities relying on this industry but overlooking the benefits of the true value of the industry. Since the MOU between SEAFDEC and CTI-CFF would end in April 2020, he encouraged the Program Committee to make the most of this collaborative arrangement. His Statement appears as **Annex 11**.

127. The representative from the Gifu Prefectural Inland Fisheries Training Center *Mr. Yutaka Nakai* expressed his appreciation to SEAFDEC for the invitation to attend the 41PCM. He presented an overview of the activities undertaken by the Training Center under its Fisheries Section, Aquaculture Section, and Ecological Environment Section. He indicated that the “Ayu of Nagara River System” of Gifu Prefecture has been declared as Globally Important Agricultural Heritage System (GIAHS) by FAO in 2002. “Ayu”

is the most important fish species in Gifu Prefecture. He also informed the Program Committee that the training program offered by the Center in 2018 has eight (8) participants from the SEAFDEC Member Countries and Departments, and for the training planned in 2019, the AMSs could send their participants through the collaborative arrangement between Gifu Prefecture and SEAFDEC. In this regard, he mentioned that further information could be obtained from the Gifu Prefecture website or through the SEAFDEC Secretariat. His Statement appears as **Annex 12**.

128. The representative from Embassy of Sweden in Bangkok and Sida, *Ms. Åsa Hedén*, thanked SEAFDEC for inviting Sweden to take part the 41PCM. She also thanked the Director General for Fisheries Malaysia for hosting the Meeting in Langkawi, Malaysia. She reiterated that SEAFDEC is an important development partner to Sweden in the delivery of SDG 14: Life below water. She added that SEAFDEC as a technical and advisory body to the ASEAN, succeeded to build capacity and management of transboundary marine resources, enhancing the conditions for sustainable fisheries in the region. She expressed the appreciation of the Sweden Embassy in Bangkok to SEAFDEC for putting more emphasis on gender awareness and capacity building in the fishing sector during the last years. Agreeing to support the initiative to develop a comprehensive regional Gender Strategy for the ASEAN Member States based on the FAO guidelines, is a major achievement of the SEAFDEC Council. Finally, she wished SEAFDEC all the best in its important works for the oceans. Her statement appears as **Annex 13**.

129. In the Statement of the U.S. Agency for International Development Regional Development Mission for Asia (USAID/RDMA) which was read by the representative from TD, the USAID/RDMA reiterated that through the USAID Oceans, USAID and SEAFDEC have been working together since 2015. Henceforth, USAID has seen significant shift in regional interests for the eCDT, sustainable fisheries management, and human welfare. In addition, the USAID commended SEAFDEC for its effort in the continued development of eACDS and expressed its full commitment to support the system and its adoption throughout the region. USAID also expressed its commitment to strengthen its relationship with SEAFDEC, especially in promoting its leadership and advancing the fisheries priorities of its Member Countries. Her Statement appears as **Annex 14**.

## **VII. OTHER MATTERS**

### **7.1 Way Forward for Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020**

130. The Program Committee took note of the proposal made by the SEAFDEC Secretariat on the “Way Forward on Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020” (**Annex 15**). The Program Committee was also informed that the proposal and the workplan would be discussed during forthcoming FCG/ASSP Meeting, after which it would be proposed to the SEAFDEC Council Meeting in 2019.

### **7.2 Update on JTF-VII**

131. The Program Committee took note of the updates on the JTF-VII (**Annex 16**) which comprises three pillars, namely: 1) strengthening the promotion of sustainable fisheries; 2) promotion of sustainable aquaculture and resource enhancement; and 3) promotion of sustainable development in inland fisheries; and that the JTF-VII would cover the 5-year period starting from 2020. The Committee was also informed that the draft annual plan of the JTF-VII would be presented and discussed at the forthcoming Program Committee Meeting in 2019.

132. The Program Committee Member for Japan informed the Program Committee that he would make his best effort to follow-up with the Ministry of Finance of Japan for securing the necessary budget for the JTF-VII in order to meet the requirements of the SEAFDEC Member Countries.

133. The Program Committee Member for Malaysia expressed the appreciation to the Government of Japan for supporting the countries in the realization of the Resolution and Plan of Action Toward 2020 through the the JTF. He therefore requested Japan to continue its support through the next JTF.

134. The Program Committee Member for Indonesia informed the Program Committee that during the 40<sup>th</sup> Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF) held in October 2018 in Hanoi, Viet Nam, the Minister for Indonesia expressed the appreciation of Indonesia to the cooperation rendered by the Government of Japan through SEAFDEC, and looked forward to having continued support from Japan to the AMSs through the JTF.

135. The Program Committee Member for Thailand also expressed the gratitude to the Government of Japan for extending support to SEAFDEC, not only financially but also technically. She also requested the Government of Japan to continue supporting SEAFDEC through the JTF; and informed the Program Committee that Thailand would send a letter to the Government of Japan to seek for continued support through the JTF.

136. The Program Committee Member for the Philippines also expressed the appreciation to the Government of Japan for its continuing support for the implementation of programs that benefit the SEAFDEC Member Countries. He suggested that the SEAFDEC Secretariat may consider drafting a Council Resolution expressing the gratitude and appreciation of the Member Countries to the Government of Japan and requesting for continued support through the JTF-VII.

137. While also expressing the gratitude to the Government of Japan for the continued support to Southeast Asian countries through SEAFDEC which contributed to the sustainable development of fisheries as important source of protein, food, income, and economic development of the countries, the Secretary-General of SEAFDEC informed the Program Committee that SEAFDEC will reiterate the countries' appreciation during the next Meeting of the SEAFDEC Council in 2019.

### **7.3 SEAFDEC Gender Strategy: Mainstreaming Gender in SEAFDEC and Its Programs**

138. The Program Committee noted the SEAFDEC Council's directives, and the progress in the development of the draft SEAFDEC Gender Strategy (**Annex 17**).

### **7.4 Procedures for Inviting Other Organizations and Non-member Governments to Attend the SEAFDEC Council Meeting**

139. The Program Committee took note of the draft Procedures for Inviting Other Organizations and Non-member Governments to Attend the SEAFDEC Council Meeting (**Annex 18**), which was prepared by the SEAFDEC Secretariat in response to the directive of the SEAFDEC Council during its Fiftieth Meeting in March 2018. The Program Committee also noted that the criteria for organizations to attend the Council Meeting are based on the "Guidelines on the Status of Various Organizations and Private Agencies Participation in SEAFDEC Programs" adopted by the SEAFDEC Council at its Thirty-second Meeting in 2000, with additional elaboration only on the procedures for extending invitation.

140. While expressing support to the draft Procedures prepared by the SEAFDEC Secretariat, the Program Committee Member for Japan suggested that the official letter to notify the final decision of the Council should specify only the final decision whether the proposed attendance has been approved or not, while the record of the decisions by individual Council Directors should be kept in the Secretariat and should not be disclosed.

141. In response to the query from the Program Committee Member for Indonesia about the Procedures, it was clarified that invitations would be extended to current donors and organizations having legal working relationship with SEAFDEC, and to the ASEAN countries that are not SEAFDEC Member Countries, and these invitations would not need the prior approval of the Council. However, for the attendance of other organizations and agencies, the proposals regarding their attendance should emanate from the host Member Countries, and upon receipt, these will be disseminated by the SEAFDEC Secretariat to the SEAFDEC Council Directors for consideration.

142. The Program Committee Member for Myanmar suggested that the participation of Other Organizations and Non-member Governments as "Observer" should be elaborated further, *e.g.* indicating the roles and restrictions for observers.

143. The Program Committee Member for Singapore also sought clarification on whether similar procedures for other organizations to attend the PCM are also available. In response, the representative from the SEAFDEC Secretariat indicated that the “Guidelines on the Status of Various Organizations and Private Agencies Participation in SEAFDEC Programs” adopted by the Council in 2000 already provided the criteria on various types of organizations and agencies that can attend the Meetings of the SEAFDEC Council and Program Committee, and technical meetings of SEAFDEC.

144. The Program Committee Member for Brunei Darussalam suggested that once the Procedures is approved by the SEAFDEC Council, this should be made available in the SEAFDEC website.

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

145. The Program Committee took note of the prospectus for the Capacity Development Workshop on Stock Status Assessment and Estimation of SDG Indicator 14.4.1: Fish Stocks Sustainability for the Asia Pacific Region (**Annex 19**), and that this Workshop would be organized by FAO tentatively during the second half of 2019. The Program Committee also noted that SEAFDEC was approached by FAO to serve as coordinator and to facilitate the arrangements for this Workshop, of which the participants would include the Member and non-Member Countries of SEAFDEC.

146. The Program Committee Member for Viet Nam expressed the challenges encountered by the Member Countries in reporting the progress on SDG Indicator 14.4.1. She proposed that the activities related to estimation of this SDG Indicator should be conducted on an annual basis and adopted by the SEAFDEC Council.

### **7.6 Formation of Singapore Food Agency**

147. The Program Committee Member for Singapore informed the Program Committee that from 1 April 2019, a new government agency, the Singapore Food Agency (SFA) will be formed under the Ministry of Environment and Water Resource. The Agri-Food & Veterinary Authority of Singapore (AVA) will then cease to operate. SFA is setup to oversee food safety & security and it will bring together all food-related resources and capabilities from related government agencies, including AVA, for a holistic management of the food industry from farm to fork. SFA will continue to uphold Singapore’s commitment to implement the MFRD programme and propose that the Marine Aquaculture Centre (MAC), which is under the SFA, would be the Collaborating Centre to implement the MFRD programme, instead of the current Post-Harvest Technology Centre. This matter would be proposed to the forthcoming meeting of the SEAFDEC Council in 2019 for consideration.

## **VIII. CONCLUSIONS AND RECOMMENDATIONS OF THE FORTIETH MEETING OF THE PROGRAM COMMITTEE**

### **8.1 Adoption of Report of the 41PCM**

148. The Program Committee adopted its recommendations during the Forty-first Meeting of the Program Committee on 5-7 November 2018 in Langkawi, Malaysia. The Program Committee also took note of the process that the Report of the 41PCM would be submitted to the Fifty-first Meeting of SEAFDEC Council and to the ASEAN through the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).

### **8.2 Date and Venue of the Forty-second Meeting of the Program Committee**

149. In considering the date and venue of the Forty-second Meeting of the Program Committee, the Chief of Training Department (TD) informed the Program Committee that TD would host the Forty-second Meeting in Thailand. He also informed the Program Committee that TD would seek the guidance of the SEAFDEC Secretariat in finalizing the schedule, venue and related arrangements for the Meeting.

## **IX. CLOSING OF THE MEETING**

150. In his Closing Remarks, the Chairperson of the Program Committee thanked the Program Committee Members, representatives from collaborating organizations, the SEAFDEC Secretariat and Departments, as well as the observers for their valuable inputs and recommendations on the projects and activities of SEAFDEC. He also thanked the SEAFDEC Marine Fishery Resources Development and Management Department (MFRDMD) for hosting the Meeting and the meeting secretariat staff for their efforts in making the 41PCM a success. He then declared the Meeting closed. His Closing Address appears as **Annex 20**.



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## WELCOME REMARKS

*By Dato' Haji Munir bin Haji Mohd Nawi  
Director General of the Department of Fisheries Malaysia and  
SEAFDEC Council Director for Malaysia*

Assalamualaikum Warahmatullahiwabarakatuh  
Good Morning

*Dr. Kom Silapajarn, Secretary-General of SEAFDEC,  
Mr. Akito Sato, Deputy Secretary-General of SEAFDEC,  
Distinguished Members of SEAFDEC Program Committee,  
Distinguished Chief Departments and senior officials of SEAFDEC,  
Distinguished Representatives from our Collaborating Partners*

Ladies and Gentlemen,

First and foremost, let me take this opportunity to bid all of you Selamat Datang or Welcome to the 41<sup>st</sup> Meeting of the SEAFDEC here in Langkawi. I would like to extend my sincere thanks to the Chief of MFRDMD for closely working with the Department of Fisheries Malaysia in bringing the PCM back to Langkawi after 14 years since it was last held here in 2004.

I am indeed honoured and privileged to be invited to deliver this short welcome address to the meeting today.

We are getting very close to 2020. The year 2020 reminds us of the significance and relevance of many important initiatives including the one in 2011 where SEAFDEC had largely and significantly contributed to the successful high level adoption of “*Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020.*” The document had served as a guideline for formulating and implementing programs, projects, and activities through appropriate ASEAN-SEAFDEC mechanisms.

I trust everyone agrees with me that we had made substantial progress since 2011 and it is evident that ASEAN-SEAFDEC mechanism remains exceptionally effective and relevant to pursue our common objectives. As SEAFDEC is regarded as technical arm for ASEAN, it is therefore imperative that we strive to make sure that this Program Committee Meeting (PCM) delivers high quality results.

Distinguished Delegates,

The 41<sup>st</sup> PCM is particularly important wherein we will have the 3-full day to discuss at length and thorough what we should do in 2019, the final year before we step into 2020. At the same time, it is equally important for us to look beyond 2020 and strategize policies and synergize actions in face of ever challenging global fisheries issues. The 2030 Agenda and the Sustainable Development Goals (SDG) are seen as game changer to global fisheries landscape in the years to come and ASEAN-SEAFDEC should quickly streamline this high level commitment into its programs and activities.

SEAFDEC's role is cornerstone in assisting Member Countries to implement SDG14: Conserve and Sustainably Use of Oceans, Seas and Marine Resources for Sustainable Development. SEAFDEC alone may not be able to deliver this challenging tasks and therefore will have to work with partner organizations particularly in assisting Member Countries in their reporting for the four (4) key SDG14 indicators.

In Malaysia's perspective, SEAFDEC should steadfast to its mission considered and adopted by the Special Meeting of the SEAFDEC Council 2017 that is “*To promote and facilitate concerted actions among the Member Countries to ensure the sustainability of fisheries and aquaculture in Southeast Asia.*” That to say, SEAFDEC may wish keep abreast of relevant international and regional processes and

development in order to remain effective in promoting and facilitating concerted actions and maneuverer among Member Countries.

In addition, we opine that SEAFDEC should intensify efforts to facilitate capacity building and provide trainings in areas of critical importance. Areas like fish stock assessment, fish loss and waste assessment are considered to be important in light of the current international discourse in fisheries.

I am well aware that some of us will continue on to attend the 21<sup>st</sup> Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (ASSP) from 8-9 November 2018. I know it's going to be taxing and tiring discourses because I was there in Yogyakarta, Indonesia for the 39<sup>th</sup> PCM and 20<sup>th</sup> FCG in 2016. For that, may I suggest you to make time to visit this vibrant and beautiful island and enjoy all the wonderful places and experiences it has to offer. And don't forget "*to shop till you drop*" and help boost the economy here in Langkawi. It is our pleasure to extend the Malaysian hospitality and make your stay in Langkawi, Kedah a memorable one.

I believe the meeting of minds from different fields and expertise will generate new ideas in better planning the program and activities towards achieving mutual benefit and common goal. I wish you a fruitful and productive deliberation and discussions.

Distinguished Delegates,

In closing, I would like to express my utmost appreciation to the organizing team in particular MFRDMD, Secretariat and staff of the Kedah and Langkawi Fisheries Office and all partners for such an admirable preparatory works done in ensuring the success of the meeting.

Thank you.

## OPENING REMARKS

*By Dr. Kom Silapajarn  
SEAFDEC Secretary-General*

Distinguished *YBhg. Dato' Haji Munir bin Haji Mohd Naw*i, Director General of Fisheries Malaysia, Members of the SEAFDEC Program Committee, Representatives from our Collaborating Partners, My colleagues from SEAFDEC,

Ladies and gentlemen,

A very good morning to all of you, and welcome to the Forty-first Meeting of SEAFDEC Program Committee here in this beautiful City of Langkawi in Malaysia!

First of all, I would like to extend our gratitude to SEAFDEC/MFRDMD for hosting this meeting. But before going any further, on behalf of SEAFDEC and the Member Countries, I would like to express our condolences to the people of Indonesia, especially those who have been affected by the destruction brought about by the *tsunami* in Sulawesi last month. We are really saddened not only of the devastations to homes and infrastructures but also of the loss of lives of many people in Sulawesi. SEAFDEC grieves with the people, especially those from the affected provinces who suffered much as an aftermath of that tsunami.

Ladies and gentlemen, going back to this Forty-first Program Committee Meeting, please take note that for our discussion on the agenda, we will still start with the Programs under the FCG/ASSP Mechanism. As you might have noticed from the working documents, starting with this Forty-first Meeting, our discussion would be guided by the SEAFDEC Strategies adopted during the SEAFDEC Council Meeting early this year, as we have already parted ways with the Program Thrusts, and framed our agenda with the said strategies. In this connection, the projects implemented by SEAFDEC under the FCG/ASSP Mechanism have been harmonized and aligned under the six strategies prescribed in the Resolution on the Future of SEAFDEC Towards 2030. For the succeeding agenda, we would continue with the Departmental Programs and Other Programs.

As indicated in the Terms of Reference, the Program Committee is expected to review the results of the programs implemented in 2018 and endorse the proposed programs for 2019. We would also like to reiterate that the assessment of the programs and activities of SEAFDEC by the SEAFDEC Program Committee would guarantee that the issues and concerns of the Member Countries are dealt with effectively.

To our collaborating partners, we would welcome your critiques and counsel on our programs and activities that could uphold our strong partnership. Please take note that in the presentations of the projects and activities, focus would be made on the accomplishment of the project objectives as of 2018, as well as the summary of activities proposed for 2019. The presentations also include the results as recommended by the Program Committee during the Fortieth Meeting in 2017 and endorsed by the SEAFDEC Council at its Fiftieth Meeting last March. Please be assured that we would always value your recommendations for the improvement of our programs and activities. Accordingly, you must be already aware that we are making improvements in our activities to make these efficient and effective under the guidance of the SEAFDEC Council.

As before, the outputs of this Meeting including 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-first Meeting of the FCG/ASSP to be held back-to-back with this Meeting. We would deeply appreciate your utmost cooperation and active participation in the discussions. We want to harvest your valuable recommendations in promoting the sustainable development of fisheries in our region and in cultivating the role of fisheries in the unified ASEAN Economic Community.

Ladies and gentlemen, in conjunction with this opening ceremony, SEAFDEC would like to launch our new publication which is very important and in line with recommendation made during the previous Council Meeting.

With that note, ladies and gentlemen, I now declare the Forty-first Meeting of SEAFDEC Program Committee open.

Thank you very much and 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 2018 and Proposed Programs for the Year 2019

### 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
- Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management
- 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*

- Cold Chain Management for Seafood
- 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)

3.2 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 Impacts
- Meeting Socio-economic Challenges in Aquaculture
- Priority and Special Projects

*3.2.2 Training Department*

- Promotion on Strengthening of SEAFDEC Visibility and Image
- Tailor-made Training Programs
- Improvement of Fisheries Technology and Reduction of the Impact from Fishing

*3.2.3 Marine Fishery Resources Development and Management Department*

- Collaboration research between JIRCAS and MFRDMD

*3.2.4 Inland Fishery Resources Development and Management Department*

- Stock Assessment and Fish Production Potential of Inland Fisheries
- Center of Excellence for fisheries management on Inland waters

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 Development of Stock Assessment Method and Strengthening of Resources Management Measures on Tropical Anguillid Eels in ASEAN Region
- 4.2 2<sup>nd</sup> Phase of Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management

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

Agenda 6: Other Matters (Closed Session)

- 6.1 Way Forward for Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020
- 6.2 Updated on JTF-VII
- 6.3 SEAFDEC Gender Strategy: Mainstreaming Gender in SEAFDEC and Its Programs
- 6.4 Procedures for Inviting Other Organizations and Non-member Governments to Attend the SEAFDEC Council Meeting
- 6.5 Workshop on Stock Status Assessment and Estimation of SDG Indicator 14.4.1 for the Asia Pacific Region

Agenda 7: Conclusion and Recommendations of the Forty-first Meeting of the Program Committee

- 7.1 Adoption of the Report
- 7.2 Date and Venue of the Forty-second Meeting of the Program Committee

Agenda 8: Closing of the Meeting



**PROJECTS UNDER THE FISHERIES CONSULTATIVE GROUP OF THE ASEAN-  
SEAFDEC STRATEGIC PARTNERSHIP (FCG/ASSP) MECHANISM  
FOR THE YEAR 2018-2019**

**I. Projects Categorized under Strategies**

Strategy/Project Title	Lead Department	2018	2019	Appendix No.
<b>Strategy I: Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region</b>				
1. Human Resource Development for Sustainable Fisheries	TD	Y	Y	1
2. Optimizing Energy Use/Improving Safety Onboard in Fishing Activities	TD	Y	Y	2
3. Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia	TD	Y	Y	3
4. Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia	IFRDMD	Y	Y	4
5. Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia	IFRDMD	Y	Y	5
6. Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management	MFRDMD	Y	N	6
7. Promotion of Countermeasures to Reduce IUU Fishing Activities	TD	Y	Y	7
8. 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
9. Offshore Fisheries Resources Exploration in Southeast Asia	TD	Y	Y	9
10. Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region	TD	Y	Y	10
11. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD	Y	Y	11
12. Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD	Y	Y	12
13. Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia	SEC	Y	Y	13
14. SEADFDEC-EU/CITES Sharks Project Phase II	SEC	Y	Y	14
15. Strengthening the Effective Management Scheme with GIS (Geographic Information System) & RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMS <sup>1</sup>	TD	N	Y	15
<b>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</b>				
16. Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources	AQD	Y	Y	16
17. Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region	AQD	Y	Y	17
<b>Strategy III :Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region</b>				
18. 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	Y	18
<b>Strategy IV: Enhancing trade and compliance of the region's fish and fishery products with market requirements</b>				
19. Cold Chain Management for Seafood	MFRD	Y	N	19

<sup>1</sup> This project was approved by JAIF in 2018 and will be implemented in 2019.

Strategy/Project Title	Lead Department	2018	2019	Appendix No.
20. Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products	MFRDMD	Y	Y	20
<b>Strategy V: Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries</b>				
21. Assistance for Capacity Building in the Region to Address International Fisheries-related Issues	SEC	Y	Y	21
<b>Strategy VI: Empowering SEAFDEC to strengthen its roles in the region and to improve its services to Member Countries</b>				
22. Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2	TD	Y	Y	22
23. Strengthening SEAFDEC Network for Sustainable Fisheries	SEC	Y	Y	23

## II. Special Projects

Project Title	Lead Department	Period	Appendix No.
24. Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia	SEC	2013-2019	24
25. The Oceans and Fisheries Partnership (USAID Oceans)	SEC	2015-2019	25

Remarks:

Y = Program implemented during the year

N = Program not implemented during the year

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201301001
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Human Resource Development for Sustainable Fisheries		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2013-2019
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	All AMSs
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 355,196
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 44,305
<b>Project Leader:</b>	Panitnard Weerawat	<b>Involved Country:</b>	Member Countries

## **PART I: OVERALL PROJECT DESCRIPTION**

### **1. Brief Project Description**

Since 2013, TD has been conducted several regional training courses for Member Countries, 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

With the period of the 7 years of work under this project, it aims to build up and strengthen human capability especially fisheries officers of its Member Countries for sustainable fisheries development. There are several areas of training titles that the project already supported to the MCs such as the a) applicable of MCS activities for sustainable fisheries with taking consideration ecosystem approaches, b) the applicable cost effective fishery data collection, analysis and sharing systems and to c) ecosystem approaches to fisheries management and extension methodologies that aims to strengthen knowledge of the fishers of Member Countries on the importance of fisheries resource management for the sustainable fisheries through the use of training toolkits, promotion materials; posters, cartoon booklets, VCD and etc. However, with under the umbrella of sustainable fisheries development, not only the ecological, fishing activities and governance which need to be managed but as human is the key players in the sustainable fisheries development, so that the project try to focus more on the human well being aspect, especially to increase the fisher's income through the adding value activities for their catches.

**Objectives:** 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 well being in improving their income** through the adding value of the fishers' catches with the applicable and suitable methods.

**Output:** 1. pilot-learning site (s) of sustainable fisheries development in focusing on the improvement of incomes of fishers through the responsible fisheries activities, 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.

**Outcome:** Fishers in the pilot-learning site will be improved their income through the responsible fisheries.

Objective	Outcomes	Outputs	Activities
Strengthen knowledge and skills of the key national officers in dealing with the sustainable fisheries development in all aspects but focusing more on the <b>human well being in improving their income</b> through the adding value of the fishers' catches with the applicable and suitable methods	Fishers in the pilot-learning site will be improved their income through the responsible fisheries.	1. pilot-learning site (s) of sustainable fisheries development in focusing on the improvement of incomes of fishers through the value adding of the fish caught from responsible fisheries activities, 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	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 fishing activities.

### 3.2 Overall Scope/Description of Project

Activity	Description
Regional Human Resource Development on sustainable fisheries development	<ul style="list-style-type: none"> <li>- From 2013-2015, 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"> <li>• Applicable MCS activities with taking consideration of Ecosystem Approaches for sustainable fisheries</li> <li>• Essential EAFM and Extension Methodologies (2 courses)</li> </ul> </li> <li>- There were two participants from each country participated in each training course.</li> <li>- 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.</li> </ul>
Intensive Human Resource Development on Sustainable Fisheries Management and Follow up activities	<ul style="list-style-type: none"> <li>- 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 and value adding methods for capture and culture fish in suitable and appropriate ways.</li> </ul>
Production of promotion and training materials	<ul style="list-style-type: none"> <li>- The promotion materials including lesson learned of the project activities have been producing and distributing to the related sectors.</li> </ul>
Project evaluation	<ul style="list-style-type: none"> <li>- At the last year period of the project (in 2019), the project evaluation will be carried out and the results/lesson learned from the project will be reported in the regional workshop, aside from that the topics on future training needed in the SEA will be also discussed as the HRD ways forwards.</li> </ul>

### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2019

	Proposed Budget (USD)						
	2013	2014	2015	2016	2017	2018	2019
1. Follow up and onsite training activity of knowledge and experience gained from the previous Regional Training for the Trainer Course on Applicable MCS activities with taking consideration of Ecosystem Approaches for sustainable fisheries							
- Cambodia	15,500						
- Viet Nam	15,500						
2. Regional training for the trainer course on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region	20,000						
3. Follow up and onsite training activity on Improvement of Fisheries Information Collection in Coastal Small-scale and							



	Proposed Budget (USD)						
	2013	2014	2015	2016	2017	2018	2019
Inland Fisheries of the Southeast Asian Region							
- Viet Nam	12,000						
4. Regional Training Course on Essential EAFM and Extension Methodologies		36,340	35,000				
5. Development of training toolkit on fisheries extension methodologies			14,700	-			
6. 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							
6.1 Review the output-proposed fisheries management plan from the regional/national training courses for pilot-learning site selection				-			
6.2 Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders				10,000		7,500	
6.3 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				15,000		10,225	8,000
6.4 Training –workshop on Base-line survey on fisher's income and relevance data/information gathering (in collaboration with Socio-economic section)				15,000		9,700	0
6.5 Training/workshop on development of the improvement of income 's fishers work plan					12,850	10,000	8,000
6.6 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					13,500	8,075	0
6.7 Finalize and formalize of the fisheries management plan							6000
6.8 Follow up on the working progress of the project at the pilot-learning					6,400	6,400 & 4,051	9,000
6.9 Regional workshop on the activities result and reporting on the lesson learned					12,250	12,250	11,000
7. Production of promotional and training materials (in working collaborate with USAID-NOAA)	2,000	2,000	2,000	2,350	300	0	2,305
8. Evaluate of the HRD activities and find way forwards							0
	<b>65,000</b>	<b>38,340</b>	<b>51,700</b>	<b>42,350</b>	<b>45,300</b>	<b>68,201</b>	<b>44,305</b>

**PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION****1. Achievements of the Project Implementation for the Present Year 2018**

In focusing to improve the income of fishers through the responsible and sustainable fisheries activities, in the year 2018, 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 Thahton Township, Mon State, Myanmar and in the Prek Thnot Commune, Teok Chhou district, Kampot province, Cambodia. The series of the proposed activities were smoothly implemented.

**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	
1. Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders (Cambodia), 18-20 April, 2018	Workshop	FiA-Cambodia 12 pers.	4 pers.	-	5,502
2. Training on Essential Ecosystem Approach to Fisheries Management, 14-18 May, 2018, Surat Thani province	Training	DOF-Thailand 12 pers.	6 pers.	2 (DOF)	20,258
3. Training of the Trainers on E-EAFM for DOF-Thailand fisheries officers, 5-7 June, 2018 Bangkok, Thailand	Training	DOF-Thailand 7 pers.	3 pers.	1 (DOF)	(additional supporting budget from JTF)
4. Finalizes and formalizes the existing fisheries management plan for Mon State leaning site, Myanmar, 6-10 May, 2018, Naypyidaw, Myanmar	Workshop	DOF-Myanmar 12 pers.	3 pers.	-	10,700 (additional supporting budget from JTF)
5. Workshop on key stakeholder's engagement and investigate the current situation which lead to the low income of the fishers of the project sites in Cambodia, 10-12 July, 2018, Preah Sihanouk province	workshop	FiA 7 pers.	4 pers.	Local stakeholders 15	10,225
6. Training-workshop on development of the fisheries management plan for Prek Thnot Commune, Teok Chhou district, Kampot province and study visit to the existing methods to increase income for the fisheries community, 10-14 September, Rayong province, Thailand	Training-workshop	FiA-Cambodia 12 pers.	3 pers.	DOF/Thailand 2	14,000
7. Follow up activity in relevance to the formalized fisheries management plan for Mon state, Myanmar 24-26 September, 2018	Follow up/workshop	DOF-Myanmar 15 pers.	4 pers.	0	10,500
8. Initiative workshop with key persons for the project, visit to the selected project site and	Meeting	DOF-Lao PRD 8 pers.	3 pers.	0	6,800

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
prioritize of the key stakeholders (Lao PDR), 9-11 October, 2018					

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
1. Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders (Cambodia), 18-20 April, 2018	<ul style="list-style-type: none"> <li>- Agreement on the work activities of the project learning site</li> <li>- Agreement on the site that to be implemented for the project activities</li> <li>- A group of key stakeholders for the learning site were identified</li> </ul>	<ul style="list-style-type: none"> <li>- Courtesy called to the DDG of FiA, Cambodia and met with the national coordinator as well as others key officers for the HRD project implementation at a pilot- learning site in Cambodia</li> <li>- Discussed and made the selection of the specific pilot-learning site</li> <li>- Visited and observed to the recommended pilot-learning sites and</li> <li>- Identified and prioritized the key stakeholders for the activities at the project learning site</li> </ul>
2. Training on Essential Ecosystem Approach to Fisheries Management 14-18 May, 2018, Surat Thani province	-Participants gained the knowledge and understand on the concept of the E-EAFM	<ul style="list-style-type: none"> <li>- The training course was conducted, there were 12 fishery officers from DOF-Thailand participated in the training course</li> <li>- 95% of the participants full filled with their course expectation and the course objectives</li> </ul>
3. Training of the Trainers on E-EAFM for DOF-Thailand fisheries officers, 5-7 June, 2018, Bangkok, Thailand	- Number of EAFM trainers who are strengthened in the concept and application of the EAFM was added in the EAFM team of DOF-Thailand	<ul style="list-style-type: none"> <li>- 7 participants participated and was trained on the TOT on E-EAFM</li> <li>- 7 participants fulfilled with the course objectives and the course expectation</li> </ul>
4. Finalizes and formalizes the existing fisheries management plan for Mon State leaning site, Myanmar, 6-10 May, 2018, Naypyidaw, Myanmar	- Agreement and cooperation with all importance key stake holders	<ul style="list-style-type: none"> <li>- Agreement on the fisheries management plan for Mon State, Myanmar</li> <li>- A set of work plan for the activities implementation in relevance to the main fisheries management plan of Mon State</li> </ul>
5. Workshop on key stakeholder's engagement and investigate the current situation which lead to the low income of the fishers of the project sites in Cambodia, 10-12 July, 2018, Preah Sihanouk province	- List of the real and specific issues and problems in leading to the low income of the fishers in the Prek Thnot Commune, Teok Chhou district, Kampot province	<ul style="list-style-type: none"> <li>- Conducted a three days' workshop to engage key stakeholders,</li> <li>- Identified and prioritized of the real issues in leading to the low income of the fishers in narrowing deep down to the root cause of the issues and screened others current situation for the management plan to improve the income for the fishers in adding value for their catches</li> </ul>
6. Training-workshop on development of the fisheries management plan for Prek Thnot Commune, Teok Chhou districk, Kampot province and study visit to the existing methods to increase income for the fisheries community	- Draft of the fisheries management plan which focusing to increase the income of the fishers through the responsible fisheries	<ul style="list-style-type: none"> <li>- Conducted of the training-workshop to develop the management plan in targeting to improve the income for fishers through the value adding of their capture/culture.</li> <li>-The plan will be developed in related to the results on the specific issues and the opponent in increasing the incomes for the communities which found out</li> </ul>

<b>Planned activity</b>	<b>Expected outcome/output</b>	<b>Achievements</b>
10-14 September, Rayong province, Thailand		as of the pilot-learning site
7. Follow up activity in relevance to the formalized fisheries management plan for Mon state, Myanmar 24-26 September, 2018	- Report on the “Result and lesson learned from the pilot project implementation in applying the concept of the EAFM in to the real situation of the project leaning site- Mon State, Myanmar”	- Conducted of the follow up activity and evaluate on the result of sub-project implementation which is carried out in the Mon State, Myanmar
8. Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders (For leaning site in Lao PDR, 26-29 November, 2018)	- 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	- Courtesy call to the DG of Department of Livestock and Fisheries (DLF) and meet with the national coordinator as well as others key officers for the HRD project implementation at a pilot- learning site in Lao PDR - Discussion and the selection of the specific pilot-learning site will be made - The recommend pilot-learning sites will be visited and observed - The key stakeholders for the activities at the project learning site will be identified and prioritized

#### 4. List of Completed Publications and Others

<b>List of completed publications for the year 2016</b>	<b>Type of media</b>	<b>Attached e-file</b>
1. Report of the Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders (Cambodia)	e-file	
2. Report of the Training on Essential Ecosystem Approach to Fisheries Management for fisheries officers of DOF/Thailand	e-file	
3. Report of the Training of the Trainers on E-EAFM for fisheries officers of DOF/Thailand	e-file	
4. Report of the workshop on Finalizes and formalizes the existing fisheries management plan for Mon State leaning site, Myanmar	e-file	
5. Report of the workshop on key stakeholder’s engagement and investigate the current situation which lead to the low income of the fishers of the project sites in Cambodia	e-file	

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

<b>Planned activity</b>	<b>Evaluation/ Views from Participants</b>
Observation on the performance of each participant as well as apply the semi-interview to each participant on their opinion and their understanding of the concept and approach of fisheries management as well as the extension approach	Core team of Myanmar and Cambodia (key officers and key stakeholders) have been strengthening their understanding and skilled up on the process and extension methods in implementing the fisheries management through the focusing on the increase income of the fishers/communities via the responsible and sustainable fisheries management.

#### 6. Major Impacts/Issues

Language is a challenge factor in communication with the key target officers in somehow. However, we still can cope up with this challenge.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-Activity, Workplan and Estimated Budget for the Year 2019

Proposed Activity	Description of Proposed Activity	Proposed Budget (USD)
Activity 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 (Lao PDR)	Conduct a three days workshop to engage key stakeholders and discuss to identify and prioritize of the real issues in leading to the low income of the fishers in narrowing deep down to the root cause of the issues and screening others current situation for the management plan to improve the income for the fishers in adding value for their catches	8,000
Activity 2: Training/workshop on development of the improvement of income 's fishers work plan for Lao PDR	Conduct training-workshop to develop the management plan in targeting to improve the income for fishers through the value adding of their capture/culture. The plan will be developed in related to the specific issues which found out from the activities 1. of the pilot-learning site.	8,000
Activity 3: Finalizes and formalizes the existing fisheries management plan for leaning site, Loa PDR	A workshop will be conducted in seeking the agreement on the fisheries management plan for Lao PDR also a set of work plan for the activities implementation in relevance to the main fisheries management plan will also be developed	6,000
Activity 4: Follow up on the working progress of the project at the pilot-learning sites, in Cambodia and Lao PDR	SEAFDEC team visit to the pilot-learning sites in countries for monitoring and evaluation of the work implementation	9,000
Activity 5: Regional workshop on the activities result and reporting on the lesson learned from the HRD project	Conduct a regional workshop to report the result of the project activities, monitoring and evaluation and discuss on the ways forwards of the lessons learned.	11,000
Activity 6: Production of promotional and training materials (in working collaborate with USAID-NOAA)	Work in collaborate with USAID-NOAA in producing the training material/toolkit on the EAFM application and implementation	2,305

List of Actual Sub-activity
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
2. Training/workshop on development of the improvement of income 's fishers work plan
3. Finalizes and formalizes the existing fisheries management plan for leaning site, Loa PDR
4. Follow up on the working progress of the project at the pilot-learning in Cambodia and Lao PDR
5. Regional workshop on the activities result and reporting on the lesson learned from the HRD project
6. Production of promotional and training materials (in working collaborate with USAID-NOAA)

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 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)	-key stakeholder's engagement -real and specific issues which lead to low income of the fishers
Activity 2: Training/workshop on development of the improvement of income 's fishers work plan (for Lao PDR)	-plan of the improvement income of fishers through the value adding in fish catch which are from responsible captures and cultures as well as strengthen knowledge,

Proposed Activity	Expected Outcomes/Outputs of Activity
	awareness and experience of the key officers and key stakeholders in methods, techniques to increase income of the fishers through the value adding concept
Activity 3: Finalizes and formalizes the existing fisheries management plan for leaning site, Loa PDR	-Agreement on the fisheries management plan for Mon State, Myanmar -A set of work plan for the activities implementation in relevance to the main fisheries management plan of Mon State
Activity 4: Follow up on the working progress of the project at the pilot-learning (in Cambodia and Lao PDR)	- pre- result of the pilot project-learning site's monitoring and evaluation
Activity 5: Regional workshop on the activities result and reporting on the lesson learned from the HRD project	-a set of pilot project's monitoring and evaluation result -a set of lesson learned -a set of way forwards
Activity 6: Collaboration with USAID-NOAA in producing the training material/toolkit on the EAFM application and implementation	-a set of training materials/toolkit on the EAFM application and implementation

### 3. Schedule of Activity for the Year 2019

Proposed Activity	2019											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 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												
Activity 2: Training/workshop on development of the improvement of income 's fishers work plan conducts together with the training course on improvement of fishers' income through responsible fisheries activities and value adding on the fisheries products and study visit of the keys stakeholders of the pilot project to Thailand and observation on value adding in fish												
Activity 3: Finalizes and formalizes the existing fisheries management plan for leaning site, Loa PDR												
Activity 4: Follow up on the working progress of the project at the pilot-learning (in Lao PDR)						Cam			Lao PDR			

Activity 5: Regional workshop on the activities result and reporting on the lesson learned from the HRD project														
Activity 6: Production of the EAFM application and implementation (in collaboration with USAID-NOAA)														

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 20130102
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Optimizing Energy Use and Improving Safety in Fishing Activities		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2013-2019
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 355,293
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 31,290
<b>Project Leader:</b>	Suthipong Thanasansakorn	<b>Involved Country:</b>	SEAFDEC 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 fisher at sea. Awareness building on the safety at sea for fisher includes the improvement of safety at sea, living and working conditions on board to ensure that human well-being of fishers will be strengthened.

In the capturing process, the fuel cost takes up the majority of the operational cost and directly decrease the income of fishers. With reference to the global concern about the climate change that includes the reductions of greenhouse gases, either by reducing the source of polluters. This project deals with fuel efficiency measures that require minimum modification of their existing equipment to optimize energy using for the fishing operation. It is, therefore, the main activities under the project include transferring appropriate ways to optimize the use of energy for the fishing vessels. It also includes adjustment/improvement of current practices of the vessels.

In this connection, this project aims at transferring appropriate and applicable technology and knowledge to fishers and fisheries officials in order to optimize energy use in fishing activities and improves safety at sea for fishing vessels especially on the small fishing vessel.

### **2. Background and Justification**

Regarding to the optimizing energy and safety at sea issues, the following paragraphs provide the reference to the ASEAN-SEAFDEC Resolution and Plan of Action 2020.

Resolution:

1. Support ASEAN efforts to promote low carbon development by minimizing the contribution of the fisheries sector to green-house gas emissions, with emphasis on promoting energy efficiency and use of alternative energy sources
2. Improve the working conditions of people engaged in fisheries activities, and strengthen measures for safety of fishing vessels taking into consideration regional specificity
3. Increase the efficient use of the alternative energy and reduce the use of carbon fossil energy by using appropriate fishing gear and fishing boats designs in fishing operation.

Plan of Action – Fisheries Management:

4. 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

5. 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: Regional and national training on optimizing energy use and safety at sea for fishing vessels  Activity 1.1 Training workshop, project reviews, follows up meeting on the optimizing energy use and safety at sea for fishing vessels in Southeast Asian countries.  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 operation and practices with optimizing energy used included working condition and safety at sea.	Outcome 2: Appropriate ways and technique 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 develop conceptual framework and way forward to promote the optimizing energy and safety at sea in SEA region.	Activity 2: Research and development on the implement of fishing operation with optimizing energy use
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 of 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 Regional training/workshop on	A series of activities to promote and transfer the optimization of energy use and safety at sea for fishing vessels has been carried out in the

Activity	Description
optimizing energy used and safety for small fishing vessel	Member Countries.
Sub-Activity 1.1: Training workshop on the optimizing energy and safety at sea for small fishing vessels	Activities will provide the technical knowledge and skill to fisheries officers and other key stakeholders for the existing methods in optimizing energy and safety at sea in fishing activities. In addition, awareness building on energy saving and safety at sea, as well as improvement of working condition onboard fishing vessels will be strengthened. SEAFDEC/TD will support the establishment of the network of stakeholders in the coastal area for sharing technical information, threats, issues, and way forward for the promotion of energy optimization and safety at sea in capture fishery of the Southeast Asia will be identified.
Sub-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 situation of energy use in fishing operation as well as the update on information of safety at sea for small fishing vessels to enhance human capacity on energy saving and safety in marine fisheries.  Share and exchange the information and technology on energy saving and safety at sea, network of stakeholders in coastal provinces both country level and regional 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 to improve energy efficient utilization (energy saving) in fishing activities through the efficiency improvement of the vessel, gears and equipment relate to fishing operation.
Activity 2.1 Improve appropriate fishing gear and Fishery machinery base on energy efficiency and safety at sea.	Improve appropriates auxiliary fishery machinery for seine vessel, due to inappropriate of manpower onboard and fishing fleet hydraulic deck machinery and fish handling technique/tools are necessarily used to support fishing activities onboard,
Activity 2.2 Improve appropriate fishing vessel design,	New purse seine fishing vessel design appropriate for local Thai fishers and Southeast Countries.
Activity 3 Information dissemination	Revision of the current handbook and promotional 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 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	31,000	30,000	31,000	25,175	25,000		28,000
	Sub-activity 1.2		30,000			0	23,000	
Activity 2:	Activity 2:					3,000	78,000	
	Sub-activity 2.1:							
Activity 3	Sub-activity 3.1:	5,000	5,000	5,000	4,825	4,000	4,003	3,290
	<b>Total</b>	<b>36,000</b>	<b>65,000</b>	<b>36,000</b>	<b>30,000</b>	<b>32,000</b>	<b>105,003</b>	<b>31,290</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

Explain briefly the major achievements of the project conducted in the past year based on overall project objectives

#### Activity 1.

- 1) The on-site training on energy saving and safety at sea on progress target for Myanmar, on November 2018

#### Activities 2

- 1) Appropriate hauling device and deck machine for seine fisheries in progress, it's implements at the pilot fishing vessel.
- 2) Drawing of appropriate trawl fishing vessel design for Thailand and SEA countries (New type of trawl vessel)
- 3) Draft of drawing of appropriate purse seine fishing vessel design for Thailand and SEA countries (New type of trawl vessel)

#### Information

- 1) Drawing of trawl fishing vessel designed, booklet on vessel profile and technical information base on Thailand harbor department standard.

### 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 2			Thailand		50,436

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.2	<ol style="list-style-type: none"> <li>1. Participants can transfer and utilize the knowledge and information on energy saving and safety at sea</li> <li>2. Threats, issues and way forward for the promotion of energy saving and safety at sea</li> <li>3. Network of stakeholders in coastal provinces</li> </ol>	On-site training on energy saving and safety had conducted in Myanmar, November (in progress)
Activity 2	The concept of an appropriate fishing vessel design for trawl fishery, fishing gear and fishery machinery aims to improve fishing vessel efficiency for CPUE base for improving working conditions, energy saving and safety at sea, living conditions and reduce crews working on board, etc.	<p>Hydraulic deck machinery and hauling device for seine operation base on optimizing energy used/safety and reduction of manpower onboard (manpower reduces target of 60%) on progress during installation on pilot fishing vessel in Pattani Province, and.</p> <p>Drawing of trawl vessel with appropriate for Thai fishing fleet reference to national and others relevance standard. (using concepts from the brainstorming meeting)</p>
Activity 3		
Sub-activity 3.1		Drawing of trawl fishing vessel designed

### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1. Drawing of trawl fishing vessel designed, vessel profile and booklet on the technical information base on Thailand harbor department standard.		

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Activity 2	
Activity 3	

## 6. Major Impacts/Issues

### Issues

Currently the cost of fuel consumption had directly affected to the fish vessel operation cost fish have to pay at about 70% of total income. Fishermen have looked the ways forward to reduce this operation cost to support their sustainable of their occupation and incomes. The one exiting method spends a long time at sea. This implements also some loss to their catchy product, due to the landed had loose fresh quality. Due to fish will be degraded after catching aboard and limited of shelf life, even handling procedure is very good. The seafood product is greatly influencing the quality of freshness. Shelf life extension that can possibly be achieved with the temperature control at low temperature, ice is important to preserve freshness.

### Impacts

1. With the period of over 14-20 days with ice preservation technique. Some of Erie catch landed on-board become degraded by the period due to melted of ice and change the quality of freshness. The fish quality will degrade observe by shape, color and smell of appearance. This is a key important freshness identification factor for the buyer and the consumer, it is will direct impact to the income of fisher and the utilize of fishery resources.

2. Fish hold quality, temperature gain/loss in side fish hold, cause to improve the melting of ice and loss of ice. At high temperature is extend the growth rate of bacteria, and enzymatic actions. Improve of fish hold quality and hygiene, e.g. fish hold insulation, material, equipment to reduce bacteria accumulated is an important factor.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2019

### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)		
Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
Sub-activity 1.1	Reviews training program on the optimizing energy and safety at sea for fishing vessels	28,000
Activity 2		
Sub-activity 2.1	Improvement of fish handling tools and storage facilities of the pilot vessel e.g. installation of refrigeration system for producing cooling medium onboard. (Binh Dinh province, Viet Nam)  Monitoring and evaluating the fresh quality of fish handling onboard and at the landing site.	
Activity 3		
Sub-activity 3.1	Information and dissemination materials	3,290
	<b>Grand total</b>	<b>31,290</b>

### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
Sub-activity 1.1	Regional Review training on optimizing energy and safety at sea for fishing

Proposed Activity	Expected Outcomes/Outputs of Activity
	<p>vessels</p> <p>Activities will provide the technical knowledge and skill to fisheries officials and other key stakeholders for the existing methods and techniques in optimization energy, safety at sea in fishing activities. In addition, awareness building on optimization energy and safety at sea, as well as improvement of working condition onboard fishing vessels will be strengthened. SEAFDEC/TD will support for the establishment of a network of stakeholders in the coastal area for sharing technical information, threats, issues and the way forward for the promoting of energy saving and safety at sea in capture fishery of Southeast Asia will be identified.</p> <p>Network for optimizing energy in SEA will be conducted at the Regional training workshop on optimizing energy and safety at sea for small-scale fishing.</p>
Activity 2	
Sub-activity 2.1	<p>This activity will be improvement of fish handling tools and storage facilities onboard and at the landing site including provide the appropriate action onto reduce the fish quality losses and maintain fish quality by ensuring adequate temperature, hygiene, and low ice-melting rates as a result of reduced heat infiltration through container walls and improve fish-handling practices. Leading to better quality fish being landed, making longer fishing trips and better fish prices possible for fishers included make handling easier by reducing the handling frequency of fish and protect the fish from the risk of physical damage and contamination.</p> <p>The data will collect at pilot sites for identifying that may need remediation or some other technical information to reduce the post-harvest loss of capture fishery and improve utilize of fishery resources. Also, by comparing results of fish, fresh quality at the landing site</p>
Activity 3	
Sub-activity 3.1	<p>Compilation of report on optimization energy and safety for small fishing vessel</p> <p>Major outputs from the implementation of project activities and their progress will be disseminated to the Member Countries and other relevant agencies through the project's website, training and promotional materials, etc. The outputs from this activity could be used as the regional reference for optimizing energy and safety at sea for fishing vessels in the Member Countries. Revision of the current handbook and promotional materials used in On-site Training on Optimizing Energy and Safety at Sea for Small Fishing Vessel.</p>

### 3. Schedule of Activity for the year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activity 1.1												
Activity 2												
Sub-activity 2.1												
Activity 3												
Sub-activity 3.1												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201301003
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 345,328
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 50,850
<b>Project Leader:</b>	Isara Chanrachkij	<b>Involved Country:</b>	SEAFDEC 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	<p>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.</p> <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</p>

Activity	Description
	<p>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 2015-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
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	0	0	5,360	30,000	18,360
	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	31,510
	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-activity 3.2: End of project regional seminar	0	0	0	0	0
<b>Sub-Total Budget</b>		<b>53,700</b>	<b>48,560</b>	<b>52,000</b>	<b>129,068</b>	<b>50,850</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

Three main activities include 1) Survey on Fish Enhancing Devices (FEDs), 2) Report of National Workshop and On-site Training on the Introduction of Fish Enhancing Devices (FEDs) in Binh Thuận Province, Viet Nam, and 3) Regional Workshop on Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia, that have been undertaken in 2018 and partly in 2018. Draft report on FEDs designs, material, construction and recommendation on the good practices and management of FEDs installation in Thailand. Mapping of important fishing grounds and habitats on FEDs installation in the Gulf of Thailand and Andaman Sea will be published. SEAFDEC summarized the

updates on the activities of resources enhancement activities in Southeast Asia and sought for comment on the future strategy in resource enhancement concept for the next JTF-7 through the Workshop/Expert consultation on suitable measures for sustainable fisheries resource 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: 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		10	5		3,502
Sub-activity 1.3: Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation		20	10	3	35,000 (Expected)
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					10,586.89
Sub-activity 2.2: Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management		36	4	2	15,000 (Expected in the last quarter of 2018)
Sub-activity 2.3: Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures					30,000 (Expected in the last quarter of 2018)
Activity 3: Promotion and extension on rehabilitation of fisheries resources and habitats/ fishing grounds in ASEAN Region					
Sub-activity 3.1: Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness					1,094 (Expected in the last quarter of 2018)

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1: Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices	Outcome: Application and verification of various methodologies for quantitative assessment, monitoring and evaluation of the effectiveness of resources enhancement initiatives.	
Sub-activity 1.1: Investigation/review of the status of critical habitats/fishing grounds in the Southeast Asian region	Output: Mapping of important critical fishing grounds and habitats in association with fish species.	Survey reports on the designs, material, construction and recommendation on the good practices and management of FEDs installation in Thailand, Mapping of important fishing grounds and habitats on FEDs installation in the Gulf of Thailand and Andaman Sea
Sub-activity 1.2: Information collection on suitable designs of resource enhancement practices including their evaluation and promotion		Report on the workshop/expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation includes the way forward
Sub-activity 1.3: Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation		
Activity 2: Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds	Outcome: Strengthen and developed of human capacity in fisheries resources enhancement and habitat conservation	
Sub-activity 2.1: Technical assistance in a pilot site for suitable designs of resource enhancement practices	Output: 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.	Report of National Workshop and On-site Training on the Introduction of Fish Enhancing Devices (FEDs) carried out in Binh Thuận Province, Viet Nam, 6-8 March 2018
Sub-activity 2.2: Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management		Series of activities report on the Study on Enhancement of Sustainable Management of the Blue Swimming Crab Fisheries in Kep Province, Cambodia
Sub-activity 2.3: Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures		
Activity 3: Promotion and extension on rehabilitation of fisheries resources and habitats/fishing grounds in ASEAN Region	Outcome: Rising awareness of resources users on the important of fisheries resources enhancement and habitat conservation	
Sub-activity 3.1: Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness	Output: Publication of the promotion materials on importance of fisheries resources enhancement and habitat conservation	Publication distribution on Consolidating the strategies for fisheries resources enhancement in Southeast Asia “Proceedings of the Symposium on Strategy for Fisheries Resources Enhancement in the Southeast Asian Region”.
Sub-activity 3.2: End of project regional seminar		-

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1. Survey reports on the designs, material, construction and recommendation on the good practices and management of FEDs installation in Thailand	Publication	
2. Technical Meeting on suitable measures for sustainable fisheries resource enhancement and habitat conservation	Publication	
3. Definition of FED and FAD in Southeast Asia	Hard copy	
4. List of the topic on need assessment of SEAFDEC Member Countries	Hard copy	
5. Survey reports on the designs, material, construction and recommendation on the good practices and management of FEDs installation in Thailand	Publication	

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

Planned activity	Evaluation/ Views from Participants
Activity 1:	
Sub-activity 1.1:	Compilation of information and development of database that could be referred to by Member Countries
Sub-activity 1.2:	Mapping of important critical fishing grounds and habitats and associated fish species should be conducted taking into consideration various sources of information, <i>e.g.</i> indigenous knowledge of fishers, scientific researches, etc.
Sub-activity 1.3:	
Activity 2:	Monitoring and evaluation of successes and failures of resources enhancement initiatives should be carried out based on intended objectives, <i>i.e.</i> whether for enhancing resources/stocks, attracting fish to increase production and incomes of fishers, protection from encroachment, etc.
Sub-activity 2.1:	Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management
Sub-activity 2.2:	Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures
Sub-activity 2.3:	Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures
Activity 3:	
Sub-activity 3.1:	Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness

#### 6. Major Impacts/Issues

The project is going to terminate in 2019. All activities in 2019 are to be summarized for the results of the implementation in year 2014-2018. In addition, way forward and direction of the project implementation in 2020 is required to finalize and prepare for implementation during the new phase of Japanese Trust Fund consideration.

Fisheries resources enhancement is required to improve in SEAFDEC Member Countries in different tools and practices. The project has already preliminary identified the needs 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 are the hindrance of technical constraints that need to be supported by SEAFDEC, or the sharing experience among SEAFDEC Member Countries facilitated by SEAFDEC.

The impact on the installation of artificial reef and Fish Enhancing Devices is needed to investigate. With that, SEAFDEC is establishing the collaboration with universities and local stakeholders to investigate.

The development of protocol on the collaboration takes time to undertake so that activities are lately implemented.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
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 fishing grounds in the Southeast Asian region	0
	Sub-Activity 1.2 Information collections on suitable designs of resource enhancement practices including their evaluation and promotion	0
	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.	18,360
Activity 2: Technical assistance led by 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	0
	Sub-activity 2.2: Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management.	30,510
	Sub-activity 2.3: Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures.	0
Activity 3: Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region	Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness.	980

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	Knowledge and experience to rehabilitate the critical fishing grounds and technology to construct devices of enhance the resources will be disseminated to the Member Countries through Workshop/Technical Meeting (Activity 1.3)
Sub-activity 1.1	None of Activities
Sub-activity 1.2	Survey reports on the designs, material and construction of FEDs and mapping of important fishing grounds and habitats on FEDs installation in Thailand.
Sub-activity 1.3	Report on the Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation Includes the way forward
Activity 2	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.

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
	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.
Sub-activity 2.1	None of Activities
Sub-activity 2.2	Report on the Workshop/Expert consultation on Hilsa Resource in Myanmar and Thailand. Plan of operation on the 2020-2025 on the improvement Hilsa habitat in Southeast Asia: Coast of Andaman Sea
Sub-activity 2.3	Report on the Study on Enhancement of Sustainable Management of the Blue Swimming Crab Fisheries in Kep.
Activity 3	Documentation of the best practices of the project implementation will be carried out.
Sub-activity 3.1	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.

### 3. Schedule of Activity for the Year 2019

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
Activity 1												
Sub-activity 1.1												
Sub-activity 1.2												
Sub-activity 1.3												
Activity 2												
Sub-activity 2.1												
Sub-activity 2.2												
Sub-activity 2.3												
Activity 3												
Sub-activity 3.1												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201503002
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	IFRDMD	<b>Lead Country:</b>	Indonesia
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 248,020
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 41,080
<b>Project Leader:</b>	Ms. Ni Komang Suryati	<b>Involved Country:</b>	SEAFDEC 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 aimed at clear understanding on current situation of resources, fisheries and utilization of catadromous eels in the region. The second one is aimed at improving data collection and statistics of catadromous eel catch in ASEAN Member States (hereinafter referred to as “AMS”). The third one is to enhance knowledge and capacity in AMS 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 to develop the 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
Objective 1: Having clear understanding on the present status of resources, fisheries and utilization of catadromous eels in the region	Outcome 1: 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.	Output 1: - Grasping the present status of fisheries, commercial distribution and the trades of catadromous eel in the region.	Activity 1. Clear understanding on current situation of resources, fisheries and utilization  Sharing and exchanging information on catadromous eels in the region among AMS through a workshop focusing on its fisheries.  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.  Finding out the present status of eel trade and market in AMS through interviewing the stakeholders on commercial distribution and trade on tropical eels.
Objective 2: Improving data collection and statistics of catadromous eel catch in AMS	Outcome 2: 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.	Output 2: - 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.	Activity 2. Improvement of data collection and statistics on eel fisheries  Conducting studies on species identification based on DNA technology, including the training of handling genetic information.  Developing the basic methodologies of data collection for catch/trade statistics on eel in AMS.  Having a discussion how to develop data collection methodologies for eel statistics among AMS.
Objective 3: Enhancing knowledge and capacity of AMS for conservation, management and sustainable utilization of catadromous eel resources	Outcome 3: Promoting the appropriate management of eel fisheries for the sustainable use of tropical eel resources in the region.	Output 3: - Finding important causes and factors that wreak the negative impact on tropical eels then seeking the mitigating measures.	Activity 3. Promotion of conservation, management and sustainable utilization  Conducting research in several waters in the region regarding the negative impact of environmental changes on catadromous eel resources and seeking measures



Objectives	Outcomes	Outputs	Activities
		<ul style="list-style-type: none"> <li>- Constructing guidelines on eel fishery in the region.</li> <li>- Disseminating the results of this project and also proposing guidelines/policy recommendation on eel fisheries among AMS.</li> </ul>	<p>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>Organizing 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
Activity 1. Clear understanding on current situation of resources, fisheries and utilization	<ul style="list-style-type: none"> <li>- 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)</li> <li>- 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. 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.)</li> <li>- 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. 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.)</li> </ul>
Activity 2. Improvement of data collection and statistics on eel fisheries	<ul style="list-style-type: none"> <li>- 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)</li> <li>- 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)</li> </ul>
Activity 3. Promotion of conservation, management and sustainable utilization	<ul style="list-style-type: none"> <li>- 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)</li> <li>- 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. Organizing a workshop for dissemination of the outcomes from this project and developing a policy</li> </ul>

Activity	Description
	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	- 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 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						4,108
<b>Sub-Total Budget</b>		<b>42,000</b>	<b>42,000</b>	<b>42,000</b>	<b>80,940</b>	<b>41,080</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

In 2018, IFRDMD (with SEAFDEC Secretariat (hereinafter referred to as “SEC”) and Aquaculture Department (hereinafter referred to as “AQD”) conducted the baseline studies on glass eel and elver eel exploitation in 5 countries in SEAFDEC Member Countries where eel fisheries and eel farming information collection on eel fishery, commodity chains of seeds, eel farming, with the technical level of eel culture at each country. The methods for species identification of glass eel and elver eel instead of DNA analyses and the possibilities of its application have been conducted with the scientists in the region. Regarding the lack of data and information of anguillid eels in Southeast Asia, we already shared the information through the information document on the Thirtieth Meeting of the Animal Committee (AC30).

### 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 (8-13 and 21-27 January, 19-23 February)	I: Research	15	7	30	11,116.03
Sub-activity 1.3: Survey on commercial distribution/ trade of catadromous eels (9-10 and 15-21 January, 6-9 February, 14-16 May) *	I: Research	15	7	30	21,513.45
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	6	8	4	22,785.91
Sub-activity 2.2: Study on statistical data collection methodologies (14 Feb )	I: Research	5	6	10	941.29
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				

\* Only the research/activities that have been conducted till 16 Aug. are written.

### 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.	Collected information regarding the Anguillid eel fishery for seeds (glass eels and/or yellow eels) existed in Indonesia, Philippine, Viet Nam, Myanmar, and Thailand (additional).
Sub-activity 1.3 Survey on commercial distribution/trade of catadromous eels	Understanding the amount and route of trading of eel in AMS.	Collected information regarding the commodity chains and demand-supply relationships of eel seeds in certain countries.
Activity 2: Improvement of data collection and statistics on eel fisheries		
Sub-activity 2.1 Study on catadromous eel species identification by DNA technology	The establishment of the method of species identification on genus <i>Anguilla</i> by DNA analysis.	Collected fundamental information regarding the species composition of anguillid eels in Indonesia, Viet Nam and Philippines which dominant species in AMS are <i>A. bicolor</i> and <i>A. marmorata</i>
Sub-activity 2.2 Study on statistical data collection methodologies	Developing the basic methodologies of data collection for catch/trade statistics on tropical anguillid eels in AMS.	Summary of 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	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.	Preliminary information regarding the relationship between upward migration of eels and the artificial constructions in the rivers in some countries have been obtained. 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 precautionary 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 anguillid eel from lower side to upper side of the dam to increase number of eel that survivability crossing the dam

### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
-		

### 5. Evaluation from Participants of Member Countries for Workshop 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	There was no evaluation from the participants of AMS.

Planned activity	Evaluation/ Views from Participants
distribution/trade of catadromous eels	
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.
Sub-activity 2.2: Study on statistical data collection methodologies	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.

## 6. Major Impacts/Issues

- 1) Present status of eel fishery and eel farming including the existence or not of catch statistics and conservation measures among all SEAFDEC Member Countries.
- 2) Findings regarding the existence of large-scale eel farming industry with special facilities to improve the eel farming in certain country.
- 3) Method for identifying species the glass eel/elver, not only by DNA analyses but the other methods that use morphological features and the possibility of its introduction to the fields, with the scientists in certain countries.
- 4) Discussions with the concerned DoF on how to establish and improve the catch statistics on anguillid eels.
- 5) The major parts of data collection of glass eel fishery have been conducted continuously under new JAIF project on eel till June 2019.
- 6) Regarding the lack of data and information of anguillid eels in Southeast Asia, available information was shared through the information document at the Thirties Meeting of the Animal Committee (AC30).

## PART III: PROPOSED ACTIVITIES FOR YEAR 2019

### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1: Clear understanding on current situation of resources, fisheries and utilization		
Sub-activity 1.2 Survey on trends of catadromous eel fisheries including glass eel catch	Collecting the information and data on eel fisheries in AMS (that would not be covered by new JAIF project on eels). The surveys will be carried out during the years of 2015 to 2019.	5,380
Sub-activity 1.3 Survey on commercial distribution/trade of catadromous eels including glass eel	Finding out the present status of eel trade and market in AMS (that would not be covered by new JAIF project on eels). The surveys will also be conducted during the years of 2015 to 2019 in AMS.	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	Conducting studies on population connectivity of <i>Anguilla bicolor</i> in Southeast Asia.,	5,000
Sub Activity 2.2: Study on statistical data collection methodologies	Developing the methodologies of data collection for catch/trade statistics on eel in AMS. The study on data collection methodologies will be conducted during the	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	years of 2016 to 2017.	
<b>Activity 3: Promotion of conservation, management and sustainable utilization</b>		
Sub-activity 3.1 Study on elements negatively impacting catadromous eel resources and mitigating measures	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. This activity will be carried out during the years of 2017 to 2019.	3,000
Sub-activity 3.2: Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources	Constructing 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)	Disseminating the results from this project and also proposing guidelines/policy recommendation on eel fisheries among AMS.	12,702
Activity 4: Coordination by the project leader	The project leader will coordinate and assist the 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.	4,108

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
<b>Activity 1. Clear understanding on current situation of resources, fisheries and utilization</b>	
Sub-activity 1.2: Survey on trends of catadromous eel fisheries	Accumulating the data and information on trend and intensity of anguillid eel fisheries in the areas, fields and targets for keep monitoring the present status and trends of eel fishery in the region.
Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels	Accumulating the data and information on commercial distribution and trade of tropical eels in AMS where the new JAIF project on eels does not cover directly, for monitoring the present status and trends of commercial eel industries in the region.
<b>Activity 2: Improvement of data collection and statistics on eel fisheries</b>	
Sub-activity 2.1: Study on catadromous eel species identification by DNA technology	Following the latest trend of species identification methods using DNA technology in SEA. We also seek the possibility to make new relationship and future collaborative studies with Japanese scientists through our information gathering.
Sub Activity 2.2: Study on statistical data collection methodologies	Completing the consecutive catch statistics on anguillid eels in Indonesia, Philippines and Myanmar then analyzing the trend of glass eel/yellow eel catch in Indonesia in recent years. We will also pick up the important factors/elements which should be added into the official catch statistics to improve the quality of statistics from our independent data collection through eel collectors. Through these activities, we will finalize the recommended format of catch statistics on anguillid eels that would be applicable for each SEAFDEC member country.
<b>Activity 3. Promotion of conservation, management and sustainable utilization</b>	
Sub-activity 3.1: Study on elements negatively impacting catadromous eel	Listing up the various factors and causes that would obstruct the migration and degrading the habitats of anguillid eels, such as artificial construction on stream, erosion, habitat degradation, through the literatures, information and

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
resources and mitigating measures	the field surveys.
Sub-activity 3.2: Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources	Constructing guidelines on conservation, management and sustainable utilization of catadromous eel resources in the region.
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)	Disseminating the results from this project and also proposing guidelines/policy recommendation on eel fisheries among AMS.
Activity 4: Coordination by the project leader	One assistant will be hired to carry out the project effectively.

### 3. Schedule of Activity for the Year 2019

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>Activity 1: Clear understanding on current situation of resources, fisheries and utilization</b>												
Sub-activity 1.2: Survey on trends of catadromous eel fisheries												
Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels												
<b>Activity 2: Improvement of data collection and statistics on eel fisheries</b>												
Sub-activity 2.1: Study on catadromous eel species identification by DNA technology												
Sub Activity 2.2: Study on statistical data collection methodologies												
<b>Activity 3: Promotion of conservation, management and sustainable utilization</b>												
Sub-activity 3.1: Study on elements negatively impacting catadromous eel resources and mitigating measures												
Sub-activity 3.2: 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 (incl. the summarization of the appropriate methods/measures to collect statistics on eel fishery in the												

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
region)												
Activity 4: Coordination by the project leader												

\*Field surveys under sub-activities 1.2, 1.3, 2.1, 2.2, 3.1, 3.2. and 3.3 indicated by X, will be conducted through the same research trips simultaneously in principle. In addition, data/information gathering will be conducted all through the year.



**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201505001
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	IFRDMD	<b>Lead Country:</b>	Indonesia
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 289,104
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 45,620
<b>Project Leader:</b>	Dr. Dina Muthmainnah	<b>Involved Country:</b>	All SEAFDEC Member Countries

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

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

### 2. Background and Justification

Inland fishery is 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
Objective 1: Reviewing the activities and the methodologies for promoting	Outcome 1: Understanding the present status of inland fisheries in	Output 1: - Grasping the present status of inland fisheries in the region.	Activity 1. Review of activities and methodologies for promotion of inland fisheries and find ways forward

Objective	Outcomes	Outputs	Activities
inland fisheries in AMS and finding a way forward for sustainable development of inland fisheries	AMS, as a basis of our consideration to find the way for sustainable development of inland fisheries in the region.	<ul style="list-style-type: none"> <li>- Sharing the data, information and common understanding on inland fisheries in the region among AMS.</li> <li>- Publishing a printed matter that explains the summary of the features on inland fisheries in the region at the end of this project.</li> </ul>	<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>
Objective 2: Seeking and promoting the effective management measures on inland fisheries in AMS	Outcome 2: Building up the skeleton of the framework for the management of inland fisheries in AMS.	<p>Output 2:</p> <ul style="list-style-type: none"> <li>- 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></li> <li>- 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 biology of the targeted species at specific habitat and climatic rhythm.</li> <li>- Finding the appropriate management measures and additional treatment on fisheries operation and handling the products that improve the fishers’ livelihood.</li> </ul>	<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> <p>Studying the effects of several management measures on the livelihoods of fishers in inland fisheries from the perspective of socio-economic features.</p>

Objective	Outcomes	Outputs	Activities
		<ul style="list-style-type: none"> <li>- 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.</li> <li>- 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></li> <li>- Enhancing the capacity building on management of inland fisheries in AMSs.</li> </ul>	<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: Studying and developing habitat conservation and resource enhancement measures suitable for the region</p>	<p>Outcome 3: Establishing the comprehensive policies for the management of inland fisheries in the region with relationship with various sectors and stakeholders.</p>	<p>Output 3:</p> <ul style="list-style-type: none"> <li>- 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. <i>(Minor revision on wording in 2018)</i></li> <li>- 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.</li> </ul>	<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 AMSs. <i>(Minor revision on wording in 2018)</i></p> <p>Holding a concluding workshop for establishing the comprehensive policies on inland fisheries management.</p>

### 3.2 Overall Scope/Description of Project

Activity	Description
<p>Activity 1: Review of activities and methodologies for the promotion of inland fisheries and find ways forward</p>	<ul style="list-style-type: none"> <li>- Gathering the data and information on the present status of inland fisheries in AMSs by referring to the literature, web sites, interviewing and field surveys. (Sub-activity 1.1)</li> <li>- 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)</li> <li>- Summarizing the various features and information on inland fisheries in AMSs then publishing the results as a printed matter for distribution among AMSs. (Sub-activity 1.3)</li> </ul>
<p>Activity 2: Promotion of effective inland fisheries management measures</p>	<ul style="list-style-type: none"> <li>- 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.</li> <li>- 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.</li> <li>- 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>)</li> <li>- 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>)</li> <li>- Opening regional training course(s) for the researchers and officers of AMSs 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>)</li> </ul>
<p>Activity 3: Study of habitat conservation/resources enhancement measures</p>	<ul style="list-style-type: none"> <li>- 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>)</li> <li>- Holding a concluding workshop for establishing the comprehensive policies on inland fisheries management at the end of this program. (Sub-activity 3.3)</li> </ul>
<p>Activity 4: Coordination by the project leader</p>	<ul style="list-style-type: none"> <li>- 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.</li> </ul>

### 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
<b>Sub-Total Budget</b>		<b>65,038</b>	<b>45,771</b>	<b>46,649</b>	<b>86,026</b>	<b>45,620</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

IFRDMD had conducted 4 sub-activities under three main activities (Activity 1, 2 and 3) in 2018. Under these sub-activities, we conducted one workshop\*, field surveys in Indonesia, Viet Nam, Cambodia,

Myanmar and Lao PDR, and dispatching the researchers to MRC to analyze the achievements and issues that have been conducted by MRC. IFRDMD also collected data of fish biology, fishery activity and socio-economic in 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 AMS.

*\*This workshop will be conducted in November.*

## 2. Information of Present Year Activity including Involved Stakeholders

List of ActualSub-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 (January to December 2018)*	I: Research	0	9	2	900*
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 (Viet Nam (26 Mar – 1 Feb); Myanmar (22-28 Apr); Cambodia (22-29 Apr); Lao PDR (28 Jan-3 Feb; 5-8 Mar; 20-27 May; 22-30 July); Indonesia (12-20 Mar, 23 Mar-4 Apr))*	I: Research	50	15	5	53,716.28**
Sub-activity 2.2 Holding a workshop to develop guidelines for effective inland fisheries management in the region (Planned in November 2018)	I: Research	15	18	20	26,000**
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	50	15	5	4,308.04*

\* Only the researches/activities that have been conducted till 16 Aug. are written.

\*\*The activity was postponed in 2017, so budget comes from last year (2017).

\*\*\* Total of the (expected) spent budget till the end of 2018 will be USD 86,026. The remaining budget carrying over from last years is also used to conduct the activities in 2017 then spent all the budget in the end of 2018.

## 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.	IFRDMD picked up some major components and features on inland capture fisheries in AMS by referring the result of surveys, literatures and searching from web sites. IFRDMD hires two editors to advice and develop the draft by giving the critique to authors.
Activity 2: Promotion of effective inland fisheries management measures		

Planned activity	Expected outcome/output	Achievements
<p>Sub-activity 2.1 Studying on co-management and right-based fisheries management applicable to inland fisheries in the region</p>	<p>Understanding both present status and problems on the implementation of co-management and right-based fisheries managements in AMS and seeking solution through the discussion.</p>	<p>IFRDMD conducted field surveys in Viet Nam, Lao PDR, Myanmar, Cambodia and Indonesia for information gathering.</p> <p>IFRDMD joined the survey of SEAFDEC/TD to keep following the suggestion in aforementioned from Member Countries for the activities related with inland fisheries that may support the project of IFRDMD in the future. The pilot site is in Nam Xouang Reservoir. In this occasion, IFRDMD gathers the data of fish biodiversity, fishery activity and socio economic by using the questionnaire and hires the enumerators. The data will be collected until December 2018.</p> <p>In Viet Nam, we completed the information that we gathered in 2017 about fish biodiversity and fishery activity in Red River.</p> <p>In Myanmar, we learned for the leaseable fisheries, that the winners of the auction on leaseable have to manage by themselves, since the fishing on leaseable area is influenced by season.</p> <p>We collect the data of the fish biodiversity and fisheries activity in Siem Reap Cambodia by using the form and questionnaire till December 2018. We hired 3 enumerators and they send the data by using the electronic mail.</p> <p>We also collected the data of inland fisheries in Indonesia (Koto Panjang Reservoir and Barito River) by using the questionnaire and hired the enumerators, and the data will be collected until December 2018.</p> <p>IFRDMD dispatched the researchers to MRC to analyze the achievements and issues that have been conducted by MRC.</p> <p>We also participated in the Training on Fisheries Database Management and Data Analysis in Hanoi, Viet Nam.</p>
<p>Sub-activity 2.2 Holding a workshop to develop guidelines for effective inland fisheries management in the region</p>	<p>Finding appropriate indicators for an effective management of inland fisheries in AMSs.</p>	<p>The workshop will be held in November 2018.</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.</p>	<p>Surveying and capacity building on studying for the development of habitat conservation and for resources enhancement measures applicable to AMSs.</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>

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
<p>We start to publish a printed matter that explains the summary of the features on inland fisheries in the region at the end of this project. The outline is as follows:  <b>Title: The Features of Inland Fisheries in South East Asia</b>  <i>Content:</i></p> <p>Chapter 1. Introduction  1.1. Background  1.2. Inland Waters for Inland Fisheries</p> <p>Chapter 2. Inland Fisheries and Its Present Status  2.1. Existing management dealing existing problem  2.2. Fish Resources  2.3. Fisheries Status  2.4. The Challenge to Manage the Inland Fisheries</p> <p>Chapter 3. Threat to Inland Waters Environment and Fisheries  3.1. Natural Factor  3.2. Human Factor</p> <p>Chapter 4. Desired Condition for Keeping the Sustainability of Fish Resources  4.1. Regulation  4.2. Policy  4.3. Management measure</p> <p>Author: Dina Muthmainnah, Safran Makmur, Sevi Sawestri, Aroef Hukmanan Rais, Freddy Supriyadi, Siswanta Kaban, Khairul Fatah  Editor : Prof. Dr. Ngurah N. Wiadnyana, Dr. Luky Adrianto  Glossary &amp; Bibliography: Sevi Sawestri, Khairul Fatah  Pictures/Maps: Freddy Supriyadi</p> <p><i>Schedule:</i>  August – November 2018: 1<sup>st</sup> draft  December 2018 – January 2019: 1<sup>st</sup> review</p>	Hard copies	

#### 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	There was no evaluation from the participants of AMS.
Activity 2: Promotion of effective inland fisheries management measures	
Sub-activity 2.1	There was no evaluation from the participants of AMS.
Sub-activity 2.2	Not yet conducted.
Activity 3: Study of habitat conservation/resources enhancement measures	
Sub-activity 3.1:	There was no evaluation from the participants of AMS.

#### 6. Major Impacts/Issues

1. Need for understanding 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.
2. 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.



### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

<b>(Unit: USD)</b>		
<b>Proposed Activity</b>	<b>Description of Proposed Activity</b>	<b>Proposed Budget</b>
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	Continuing the process to gather and analyze the data/information regarding the features and information on inland fisheries in the region then Publish into a printed matter that explains the summary of the features on inland fisheries in the region at the end of this project.	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	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. Dispatches IFRDMD staffs to the meetings and the survey areas to discuss with the people involved in the inland capture fisheries in the region.	5,380
Sub-activity 2.3: Opening a regional training course for the improvement on management of inland fisheries	Opening regional training course(s) for the researchers and officers of AMS to enhance capacity building on improving the management on inland fisheries.	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.	Surveying and capacity building on studying for the development of habitat conservation and for resources enhancement measures applicable to AMSs.	2,200
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 AMSs for establishing the comprehensive policies for the management of inland fisheries in the region.	15,202
Activity 4: Coordination by the project leader	The project leader will coordinate and assist the 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.	4,562

\*Since sub-activities 2.1 and 3.1 will be conducted through the same research trips simultaneously in principle, all the contents of the estimation for travel costs for dispatching staff of IFRDMD at each sub-activity are set to be the same. The fees for communication, supplies, and materials are added up in Sub-activity 2.1 together.

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
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	Proceeding with the preparatory process for publication that reflects the latest information and the results of the discussion with the people involved in the inland capture fisheries in the region.
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	Sharing the common understanding and issues/problems on the implementation process of the co-management and right-based fisheries management on inland capture fisheries among fisheries experts, officers and stakeholders in AMS. Seeking measures/solutions for these issues with developing human resources for the people involved through the meetings and field surveys.
Sub-activity 2.3: Opening a regional training course for the improvement on management of inland fisheries	Enhancing the capacity building on management of inland fisheries in AMSs.
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 usage of inland waters for developing habitat conservation and resources enhancement measures, with capacity building for the people involved in handling these issues.
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 AMSs for establishing the comprehensive policies for the management of inland fisheries in the region.
Activity 4: Coordination by the project leader	For making the project effectively, one assistant will be hired to assist the project leader making the coordination and dissemination.

## 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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												
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												
Sub-activity 2.3: Opening a regional training course for the improvement on management of inland fisheries												

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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.												
Sub-activity 3.2: Holding a workshop to develop the policy recommendation on responsible inland fisheries resources utilization in the region												
Activity 4: Coordination by the project leader												

\* Data collection activities and their analyses, including the field surveys, are conducted through the years.

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201504004
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2015 - 2018
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Malaysia
<b>Donor/Sponsor:</b>	IDB	<b>Total Donor Budget:</b>	USD 250,000
<b>Project Partner:</b>	Secretariat	<b>Budget for 2018:</b>	USD46,000
<b>Project Leader:</b>	Ms. Mazalina Ali	<b>Involved Country:</b>	Brunei Darussalam, Indonesia and Malaysia

## **PART I: OVERALL PROJECT DESCRIPTION**

### **1. Brief Project Description**

The coastal areas in the Southeast Asia provide the means of livelihood to the coastal dwellers, where hundred thousands of coastal families are directly engaged in fishing activities and coastal aquaculture including related activities such as fish processing, marketing, boat building, net making, etc. The fishers' over-dependence on the coastal fisheries resources has however, led to over-exploitation and degradation of the resources. The conflict on the multiple resource use also threatens the livelihood of coastal fishing communities. Moreover, the recent devastations caused by natural disasters hamper the vulnerability of these communities. Impacts of climate change also add complexity to the problems that they are encountering. Many fisher communities seem to be isolated and/or insufficient benefit from government services net systems that may exist in other areas of the country. In addition, the communities have to pay more for fuel, food and services, while the income from their products is an inverse. These problems brought about unsustainable use of fishery resources, by reason of the fisher communities have to continuously intensify their fishing efforts to maintain their livelihoods.

From the above afore mentioned introduction, this project which is funded by Islamic Development Bank aims to improve the socio-economic status of the coastal community through the community fisheries organization and governance. It is expected that the coastal resources utilized by the fishers could continue to sustain its function as the local livelihoods and source of food for the region's fishing communities. The target beneficiaries of this project are the Muslim communities in the region's coastal areas.

### **2. Background and Justification**

The Southeast Asian region is home to the largest Muslim populations in the world (estimated to be about 240,000,000 in 2007), which is almost one-half (about 42%) of the region's total population (in 2007: 571,337,070) with Indonesia having the world's biggest Muslim population (88% of its total population of 225,000,000). Most of the Muslim communities are in coastal areas with fishing as an ethnic occupation. Since the region's coastal fisheries resources, once viewed as inexhaustible source of fish protein for human consumption have deteriorated, concerns have therefore increased for the protection and conservation of the coastal resources for sustainable livelihoods and food security of the coastal dwellers. The ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People" (hereafter refers to "the Millennium Conference) held in Bangkok from 19 to 24 November 2001, recognized the importance of sustainable fisheries for food security and the livelihoods and well-being of the ASEAN people. The Conference was successfully concluded by the adoption of "the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region" by the fisheries related ministers and senior officials of ASEAN-SEAFDEC Member Countries as the regional common fisheries policy and priority actions.

Within the regional context, fisheries sector is being addressed among other priorities to accelerate the regional economic integration as spelt out in the ASEAN Vientiane Plan of Action as well as regional collaboration in promoting sustainable fisheries development through the ASEAN-SEAFDEC Fisheries Consultative Group Mechanism under the recently adopted ASEAN-SEAFDEC Strategic Partnership Program (FCG/ASSP). Most of the coastal fisheries communities in the ASEAN Region are characterized as small-scale fisheries. The production from small-scale fisheries contributes to national economic growth. Nevertheless, the endowment, potential, and resilience of the small-scale sub-sector have not been recognized and highlighted, while it is immensely contributed to resource utilization. This critical issue should also be addressed along line with the ASEAN Socio-Cultural Community (2008-2015) that the region's aspiration to lift the quality of life of its peoples through cooperative activities that are people-oriented and environmentally friendly geared towards the promotion of sustainable development. In addition, the coastal dwellers are also prone to the drastic change of coastal environment. In December 2004, coastal communities in Indonesia, Thailand, Malaysia, and Myanmar had to suffer from the great loss of lives and assets due to the unprecedented scale of earth quake and Tsunami. Such large-scale natural disaster further aggravated their poverty status of the people in the areas. The coastal villages throughout the region are also facing hardships due to the impact from climate change such as sea level rise, increase of sea temperature, change of fish habitat and its ecosystem, natural hazards, etc.

Since the enhancing of coastal fisheries communities' resilience is involved with various cross cutting issues and required strong commitment and coordination from national government, organizations, local institutions, this project is therefore proposed in order to improve livelihoods of the Muslim coastal dwellers, who is the majority of coastal population, through community fisheries organization and governance in order that the coastal resources utilized by the fishers could continue to sustain its function as the source of food and provide means of livelihood for the region's fishing communities. The target beneficiaries of this project are the coastal Muslim communities in the IDB countries, namely: Brunei Darussalam, Indonesia and Malaysia.

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

The overall goal of the project is to improve the socio-economic status of the coastal dwellers and to promote sustainable utilization and management of the coastal resources. The specific objectives of the project are:

- a. To enhance the capacity and capability of fishers and women in the fishing community to improve their social well-being and contribute to poverty alleviation; and
- b. To build the capacity of the fishing communities to engage in sustainable livelihoods and improved coastal resource management

#### 3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To build the capacity of the fishing communities to engage in sustainable livelihoods and improved coastal resource management	Outcome 1: Identification of the problems and needs of the community	Output 1: List of capacity building needed	Activity 1: Community Surveys and Needs Assessment
	Outcome 2: The community fisheries associations will be strengthened	Output 2: One progress report	Activity 2: Building and Strengthening of Fisheries Associations
Objective 2: To enhance the capacity and capability of fishers and women in the fishing community to improve their social well-being and contribute to poverty alleviation	Outcome 3: The communities reduced their vulnerability to natural disasters	Output 3: One progress report	Activity 3: Capacity Building on Sustainable Livelihoods and Coastal Resource Management
Objective 3: To monitor and evaluate	Outcome 4: Final project evaluation	Output 4: Final report.	Activity 4: Project Management and

<b>Objective</b>	<b>Outcomes</b>	<b>Outputs</b>	<b>Activities</b>
the progress of the project	report.		related Contingency

### 3.2 Overall Scope/Description of Project

<b>Activity</b>	<b>Description</b>
Activity 1: Community Surveys and Needs Assessment	The main objective of this activity is to establish baseline community information in order to formulate appropriate action plan and activities for sustainable management of the coastal resources and sustainable livelihoods in fisheries. Three basic sub-activities will be implemented, namely, (a) baseline survey on demographic, economic and other indicators; (b) need assessment survey; (c) using the survey results, this activity will identify and prioritize community activities for technology transfer and human resource development. The Project inputs under this activity include support to SEAFDEC and local staff resources (travel expenses) and communication costs.
Activity 2: Building and Strengthening of Fisheries Associations	This activity is intended to strengthen the fishermen associations and fisheries institutions to engage in sustainable livelihoods and coastal resource management plans and include building the capacities of existing associations. The activity will be implemented through a series of training sessions, workshops and consultative meetings including capacity building for community leaders on leadership, advocacy and community management, participatory planning on resource management and sustainable livelihood, conflict management and improving women livelihoods. Under this activity, the TA will support travel expenses of SEAFDEC and local staff resources; and workshop and meeting logistics and related expenses.
Activity 3: Capacity Building on Sustainable Livelihoods and Coastal Resource Management	This objective of this activity is to protect and enhance the existing fishing related livelihoods and to promote alternative opportunities outside the fisheries sector. This will be achieved through facilitation of technology and knowhow transfer and adoption. This activity includes knowledge transfer and training on: (a) improving and diversifying fish production systems: coastal aquaculture, cage culture and shell culture; introducing higher productive fish; and improving efficiency in fishing, postharvest techniques and fish marketing; (b) enhancing community business ventures; (c) promoting alternative livelihoods: eco-tourism, sports fishing and women and youth alternative income generating ventures; and (d) improving governance and resource use practices: responsible fishing practices and enforcement of coastal resource management rules and regulations. This sub-activity covers workshop, training, internship etc. As an input, the TA will support per diem and travel expenses of SEAFDEC and local staff resources conducting the trainings, logistics and related expenses and materials.
Activity 4: Project Management and related Contingency	This activity will be conducted at the end of the project whereby the three IDB countries and the three non IDB countries namely the Philippines, Thailand and Cambodia will be involved in a project evaluation workshop. The three IDB countries will present their project report based on experience and knowledge acquired during the implementation of the project. The three non IDB countries will benefit on technology transfer and dissemination of experiences learned by the three IDB countries considering their respective problems and needs. The final project evaluation report will be prepared by the SEAFDEC Officials from the SEAFDEC/Secretariat and SEAFDEC/MFRDMD.

### 3.3 Activity, Sub-activity and Proposed Budget for 2015-2018

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018
Activity 1. Community survey and needs assessment	Sub-activity 1.1: Inception meeting and workshop for project planning and preparation of community survey questionnaire.		18,700		
	Sub-activity 1.2: Baseline Survey and Need Assessment		15,000		
	Sub-activity 1.3: Identify and prioritize activities for capacity building				
Activity 2. Building and Strengthening of Fisheries Associations	Sub-activity 2.1: Training for fisheries associations		30,000	18,000	
	Sub-activity 2.2: Capacity building for community leaders		30,000	18,000	
	Sub-activity 2.3: Workshop to review the building and strengthening of fisheries associations and community leaders			14,000	
Activity 3. Capacity Building of Coastal Communities on Sustainable Livelihoods and Resource Management	Sub-activity 3.1: Knowledge transfer and training on improving resource use practices		13,500	7,500	
	Sub-activity 3.2: Knowledge transfer and training on enhancing community business ventures and promoting alternative livelihood		14,400	6,600	
	Sub-activity 3.3: Workshop to review the capacity building of coastal communities			14,000	
Activity 4. Project Evaluation and Reporting	Sub-activity 4.1: Report, administrative cost, office supplies			900	
	Sub-activity 4.2: Project evaluation and documentation				10,000
	Sub-activity 4.3: Terminal Regional Technical Consultation				26,000
Contingency					10,000
<b>Sub-Total Budget</b>			<b>125,000</b>	<b>79,000</b>	<b>46,000</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

The Islamic Development Bank (IDB) agreed to extend the duration of the project until June 2018 as the participating country are still in the process of completing all planned activities. The terminal report will be submitted to the IDB within 90 days after the completion of the project. The Terminal Regional Technical Consultation on Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management was organized in Bandar Seri Begawan, Brunei Darussalam from 20 – 22 March 2018. Participants of Terminal RTC suggested to continue this project as it gives positive impact to the selected coastal communities. Participants also suggested to expand the project to other Member Countries such as Cambodia, Philippines, Thailand and Viet Nam to enhance their coastal communities' resilience. A short video was successfully completed as one of the outputs of this project to show the overall project. The video will be shown and distributed during the PCM in Langkawi, 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 4. Project Evaluation and Reporting					
Sub-activity 4.2: Project evaluation and documentation	Publication				10,000
Sub-activity 4.3: Terminal Regional Technical Consultation	Meeting	17	5		26,000

## 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 4		
Sub-activity 4.3: Terminal Regional Technical Consultation	Regional Technical Consultation	The Terminal Regional Technical Consultation on Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management was organized in Bandar Seri Begawan, Brunei Darussalam from 20 – 22 March 2018. All participating countries and observer from Cambodia, Philippines, Thailand and Viet Nam attended the Terminal RTC.

## 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management	Video	-

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

Planned activity	Evaluation/ Views from Participants
Activity 4	
Sub-activity 4.3: Terminal Regional Technical Consultation	The participants discussed the impact of project to the coastal community and agreed that the project give positive impact to the community.

## 6. Major Impacts/Issues

This project has successfully provided additional income to the communities. Through the courses conducted, fishing boat and engine breakdown time has been reduced, as well as the maintenance cost were reduced for 30%.



**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201301005
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of Countermeasures to Reduce IUU Fishing		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Malaysia
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 291,505
<b>Project Partner:</b>	FAO, NOAA, USAID	<b>Budget for 2019:</b>	USD 30,760
<b>Project leader:</b>	Kongpathai Saraphaivanich	<b>Involved Country:</b>	SEAFDEC 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, and 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 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 Material.

### 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 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 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.

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” in

coordination and cooperation with SEAFDEC Member Countries 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 regional fishing vessels record (RFVR) and Port State Measures, it has become clearer that an extension of the project period will provide more benefits to SEAFDEC Member Countries 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	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	to reduce IUU fishing activities by Member Countries	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
Activity 1: Promotion of Regional Fishing Vessels Record (RFVR)	<p><i>Sub-activity 1.1: Development and management of RFVR Database</i></p> <p>Follow up the approval of the Regional Fishing Vessels Record (RFVR) activity by the SEAFDEC Council at its 45<sup>th</sup> 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 SEAFDEC Member Countries. The database will use as tool to combat IUU fishing in the region.</p> <p><i>Sub-activity 1.2: Technical workshop on RFVR database development and management</i></p> <p>The technical workshop will be organized depend need and suitable. The selected/ nominated person who are involved in/and responsible for this activity. The selected relevant Member Country will be invited to participate in the workshop/ TD staffs who conduct in this database will visit each country to discuss and consult for development and management on database of RFVR of 24 meters in length and over.</p> <p><i>Sub-activity 1.3: Technical assistant on using of RFVR Database</i></p> <p>The technical assistance on using of RFVR database and existing mechanism in SEAFDEC Member Countries will be conducted. The output will support and strengthen system of fishing license and vessel registration for Member Countries to reduce IUU fishing.</p>

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

### 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: 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	20,000	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 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	23,000	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		2,000	500	1,000	1,000	1,000	1,094	
<b>Sub-Total</b>		<b>45,000</b>	<b>36,900</b>	<b>35,800</b>	<b>29,400</b>	<b>73,000</b>	<b>40,645</b>	<b>30,760</b>

## PART II: ACHIEVEMENT OF 2018 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 AMSs.
- The use of RFVR database was promoted to relevant government agencies in Myanmar through observation on existing fishing licensing system and existing process on port control from 11- 14 June 2018.
- The expert meeting on the RFVR as management tool to combat IUU fishing in ASEAN is planned to organize in November 2018. The Meeting will come up with strategies and way forward for Asian Member States and SEAFDEC to prevent, deter and eliminate IUU fishing through initiate RFVR less than 24 meters. To prepare information of this Meeting, the questionnaire related to fishing vessel, situation of AMS to combat IUU fishing was sent to AMSs. To cooperate with other international organization such as Food and Agriculture Organization of the United Nations (FAO) and National Oceanic and Atmospheric Administration (NOAA) to support and capacity building to implementation of PSM for AMS. The Regional Training on Port State Measures Implementation in Southeast Asia was organized from 20 to 23 February 2018 in Bangkok, Thailand. There were 46 fishery managers from SEAFDEC Member Countries except Lao PDR participated in the Port State Measures activities. The training came up with better understanding on implementation of Port State Measures in Member Countries, increasing of knowledge on Port State Measures and relevant activities as a tool to combat IUU Fishing, the situation and preparation on PSM implementation in the region and way to practical improvement of Port State Measures, and moreover the regional cooperation to support the implementation of PSM in the region.

### 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 1.1: Monitoring and updating of RFVR database 24 meters in length and over					
Sub-Activity 1.2: Regional consultation on RFVR database development and management	Policy	Expert meeting will be organized in November 2018 (estimate budget 13,654 USD)			
Sub-activity 1.3: Technical assistant on using of RFVR Database	Policy		3		2,051
Activity 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	Training	22	6		25,030
Sub-Activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region					
Activity 3: Production of information materials					

### 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	Regional Fishing Vessel Record database in the region	Updating of information on the RFVR Database

Planned activity	Expected outcome/output	Achievements
Sub-activity 1.2: Technical workshop on RFVR database development and management	Regional Fishing Vessel Record database in the region	Strategies and way forward for Asian Member States and SEAFDEC to prevent, deter and eliminate IUU fishing through initiate RFVR database less than 24 meters in length
Sub-activity 1.3: Technical assistant on using of RFVR Database	Regional Fishing Vessel Record database in the region	Promotion of RFVR in Myanmar and Malaysia
Activity 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	Awareness building of countermeasures as a tool to reduce IUU fishing in the region	Regional cooperation on the support and capacity building to implementation of PSM in the region
Activity 3: Production of information materials	Awareness building of countermeasures as a tool to reduce IUU fishing in the region	

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file

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

Planned activity	Evaluation/ Views from Participants
Activity 1	Not available
Activity 2	Not available
Activity 3	Not available

#### 6. Major Impacts/Issues

Lack of expertise on vessel inspection on Port State Measure in SEAFDEC, therefore close cooperation with other organization such as NOAA to support the implementation of Port State Measures has been made. Moreover, updating of information on the RFVR Database has been done annually based on information submitted from the AMS to TD to develop of RFVR database in real-time and friendly users.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1: Promotion of Regional Fishing Vessels Record (RFVR)		
Sub-activity 1.1: Development and management of RFVR Database	Cooperation with AMS to update information on RFVR database 24 meters in length and over.	
Sub-activity 1.2: Technical workshop on RFVR database	Further technical consultations on RFVR with the members	

Proposed Activity	Description of Proposed Activity	Proposed Budget
development and management		
Activity 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 Regional Training on Vessel Inspector will be organized in collaboration with partner such as NOAA. The representatives from Member Countries will be invited to attend this training. The training will focus on process for inspection fishing vessels at port. The participants will have practice on inspection activities under the activities of Port State Measures.	30,760
Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region		
Activity 3: Production of information materials		

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1: Promotion of Regional Fishing Vessels Record (RFVR)	
Sub-activity 1.1: Development and management of RFVR Database	Updating and improving data and information
Sub-activity 1.2: Technical workshop on RFVR database development and management	The agreement, progress and way forward on development of RFVR database less than 24 meters in length and over.
Activity 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	Regional cooperation to support implementation on PSM in the region and capacity building staff concern from Member Countries to support on PSM implementation in the region
Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region	
Activity 3: Production of information materials	

## 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1: Promotion of Regional Fishing Vessels Record (RFVR)												
Sub-activity 1.1: Development and management of RFVR Database												
Sub-activity 1.2: Technical workshop on RFVR database development and management												

Activity 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												
Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region												
Activity 3: Production of information materials												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

		Project id: 20160109	
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2016-2020
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	NONE
<b>Donor/Sponsor:</b>	Global Environment Facility	<b>Total Donor Budget: (Co-finance Budget)</b>	USD 3,000,000 (USD 13,717,850)
<b>Project Partner:</b>	United Nations Environment	<b>Budget for 2019:</b>	USD 940,800
<b>Project Leader:</b>	Dr. Somboon Siriraksophon (since July 2018)	<b>Involved Country:</b>	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 include: 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. Project Overall Objectives/Targets, Outcomes, Outputs, Indicators and Activities

#### 3.1 Targets, Outcome, Output and main Activity of the Project

Objective/Targets	Outcomes	Expected Outputs	Main Activity
1) 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	<ul style="list-style-type: none"> <li>- 14 fisheries <i>refugia</i> profile reports, including GIS maps &amp; site characterizations, published</li> <li>- 14 published management plans and 24 annual reports</li> <li>- Quarterly reports [224] of network meetings and activities [including list of participants and results of work]</li> <li>- 4 annual partnership reports</li> </ul>	Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand

Objective/Targets	Outcomes	Expected Outputs	Main Activity
<p>2) National and regional policy, legal and planning frameworks for demarcating boundaries and managing fisheries <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>Increased institutional capacity in the 6 participating countries for the designation and operational management of fisheries <i>refugia</i> via the transformation of enabling environments and the generation of knowledge for planning</p>	<ul style="list-style-type: none"> <li>- 6 published national reviews and recommendations for reforms of national, provincial and municipal regulations/ordinances for responsible fishing practices at priority <i>refugia</i></li> <li>- 6 endorsed revised policies</li> <li>- 6 published national guidelines on establishing and operating fisheries <i>refugia</i></li> <li>- 6 national reports on policy, legal and institutional aspects of <i>refugia</i> establishment and management published</li> <li>- Endorsed policy and executive orders, provincial/local ordinances and by-laws</li> <li>- 6 endorsed National Action Plan for the management of priority fisheries <i>refugia</i> and associated biodiversity</li> <li>- 1 endorsed Regional Action Plan for fisheries <i>refugia</i></li> <li>- 96 quarterly and 24 annual reports on fish stocks and habitats published online</li> <li>- 6 databases online and populated with datasets</li> <li>- 6 national and 1 regional Geographical Information System online and populated with site-based information</li> <li>- Characterisations for 14 <i>refugia</i> sites accessible online</li> <li>- 1 modelling system online</li> <li>- 4 published reports of the results of demonstrations</li> </ul>	<p>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 and Gulf of Thailand</p>
<p>3) 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"> <li>- 146 online national and 1 regional catalogue of best practice approaches and measures</li> <li>- 24 communications on best practices published and syndicated</li> <li>- 24 awareness materials published online</li> <li>- Annual reports of outreach programmes at 14 priority locations, including tracking of extent of community acceptance [56 reports]</li> <li>- 6 online national web portals on fisheries <i>refugia</i></li> <li>- 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</li> </ul>	<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
		Gulf of Thailand - Information and education materials accessible at SEAFDEC and online - 1 endorsed regional report published online	
4) 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	- 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

### 3.2 Overall Scope/Description of Project

Activity	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 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,

Activity	Description
	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> .

### 3.3 Activity and Proposed Budget for 2017-2020

(Unit: USD)

Activity	Y1 2016	Y2 2017	Y3 2018	Y4 2019	Y5 2020
Activity 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
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		29,120	299,000	247,000	161,000
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		20,000	88,400	100,900	67,630
Activity 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
<b>Total Budget</b>	<b>95,650</b>	<b>289,120</b>	<b>874,000</b>	<b>940,800</b>	<b>800,430</b>

## PART II: ACHIEVEMENT OF 2017 AND 2018 PROJECT IMPLEMENTATION

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

#### *Project Management*

Letters of Agreement signed with 4/6 participating countries

National teams trained in project management and governance arrangements

*Activity/Component 1*

- Initiation of fisheries and coastal habitat information and data collection programs for 10/14 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 underway

*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 10 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 14 priority fisheries *refugia* sites for incorporation into national and regional datasets. Preparation of detailed Terms of Reference for the development and application of a modeling 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

*Activity/Component 3*

- The fisheries-refugia.org web portal 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 during early of 2018.

*Activity/Component 4*

- 10/14 sites have progressed agreement on detailed terms of reference for site-based management boards
- The Regional Scientific and Technical Committee has been organized in mid of September 2018 with aim to create the regional cooperation in the integration of scientific knowledge and research outputs with management.
- The Regional Project Steering Committee is scheduled in the 1<sup>st</sup> week of December 2018 to create the regional cooperation in the establishment and operation of a Regional System of Fisheries *Refugia*.

**2. Information of Present Year Activity including Involved Stakeholders (2018 till September)**

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1	P,R	200	10		117,785
Activity 2	P				20,000
Activity 3	I				11,880
Activity 4	R	28	8		10,4071

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
<b>Activity/Component 1</b>		
Sub-activity 1.1	Fisheries <i>refugia</i> profile reports, including GIS maps and site characterisations, published for 14 priority sites	<p>Letters of Agreement signed with 4/6 participating countries. Follow-up activities included formation of national project teams and formalizing linkages of national lead agencies with provincial/municipal agencies in proximity of <i>refugia</i> sites. Regional and national staff trained in UN Environment financial system/budget code system, financial reporting, progress reporting, and process for cash advance request.</p> <p>Initiation of fisheries and coastal habitat information and data collection programs for at 10/14 priority fisheries <i>refugia</i> sites. This has been complemented by a series of stakeholder consultation on the boundaries of fisheries <i>refugia</i> at 8/14 priority fisheries <i>refugia</i> sites. These consultations have included facilitated processes to identify key threats to fisheries <i>refugia</i> sites and to initiate discussion about possible management measures for evaluation. In this context, governance reviews, stakeholder analyses, socio-economic information and data collation, and reviews of existing management arrangements have been initiated. Information compiled by national teams is presently being maintained in national repositories with duplicates being maintained by the regional PCU.</p>
<b>Activity/Component 2</b>		
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 14 <i>refugia</i> sites accessible online	Based on the above work of Activity 1, the regional PCU is preparing as a 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. 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, existing regulations and by-laws in the areas of the 8 sites at which the project is presently working have been compiled and reviewed, with feedback provided to national teams. It is evident that this process will be an iterative one due to the non-existence in many instances of single, easily accessible repositories of legal documents at provincial/municipal levels, requiring that extensive time be spent with individuals responsible for agriculture and fisheries at the sites to prepare exhaustive compilations. The positive side of the latter however is that this has allowed for open and frank discussion at the fishing community level about the required policy and legal reforms to facilitate effective management for responsible fishing. This will allow for planned consultations with competent authorities on policy reforms planned for late 2018-2019 to be truly bottom-up.

Planned activity	Expected outcome/output	Achievements
		<p>Similarly this has allowed for past reviews of policy and legal aspects of <i>refugia</i> (terminology, procedures, recommended reforms) in the participating countries to be viewed through a more realistic lens which reflects local stakeholder needs, expectations, and concerns about socio-economic impacts of management. Again this will ensure that national and local stakeholder consultations planned for 2019 on revision of legal terminology etc reflect best, where possible, local circumstances and fisherfolk knowledge and understanding of natural systems as opposed to often vague legal jargon.</p> <p>As Component 2 needs to demonstrate a % reduction in fishing pressure at <i>refugia</i> sites during times critical to the life-cycle of priority species, significant effort has been expended on benchmarking existing fishing pressure at the sites. Methodologies for this differ by country, although all have been expanded to involve the compilation of information and data derived from abundance surveys, surveys, and landings of priority species (volume/value, fishing areas and gears). This positions the project well to deliver on the production of annual synthesis reports of new and additional information and data relating to the stocks of priority fish, crustaceans and molluscs and their habitats. In this connection, questionnaire survey templates have been prepared to: (a) compile and update information and data on the distribution of habitats; known spawning areas; locations of <i>refugia</i>; MPAs; fisheries management areas; and critical habitats for endangered species; and (b) produce detailed site characterizations for the 14 priority fisheries <i>refugia</i> sites for incorporation into national and regional datasets.</p> <p>Detailed Terms of Reference for the development and application of a modeling 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 latter include NOAA, GRID-AREDNAL, and IOC/UNESCO. Expressions of Interest for the conduct of this work will be called for in the 2nd quarter of 2019, and will be guided by the 2<sup>nd</sup> RSTC of the project.</p>
<b>Activity/Component 3</b>		
Sub-activity 3.1	Awareness materials published online, and online national web portals on fisheries <i>refugia</i>	Given Component 3's focus on knowledge exchange and learning, the fisheries-refugia.org web portal 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. The latter has recently supported the launch of a project initiative

Planned activity	Expected outcome/output	Achievements
		entitled SCS:LEARN which is presenting a series of notes and short films on contemporary issues in the environmental aspects of fisheries which is central to the concept of fisheries <i>refugia</i> which aims promote a better link between fisheries and environmental management. In this connection, the project has prepared a detailed communications strategy and will pilot a six-part short film series as part of a project social media campaign that will be operated during early of 2018.
<b>Activity/Component 4</b>		
Sub-activity 4.1	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)	10/14 sites have progressed agreement on detailed terms of reference for site-based management boards although all countries find it difficult to have this project placed on the agendas of national fisheries committee meeting's due to many of these meetings being dominated by discussions surrounding IUU fishing and audit queries of market driven country such as the European Union.

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1. The South China Sea Fisheries <i>Refugia</i> Initiative and the Sustainable Development Goals	Technical Article	
2. The SEAFDEC/UNEP/GEF South China Sea Fisheries <i>Refugia</i> Initiative	Technical Article	
3. The article on project Facebook page entitled“ SCS LEARN : The South China Sea Fisheries <i>Refugia</i> Initiative and the Sustainable Development Goals	Online Technical Article	
4. The article on project Facebook page entitled“ SCS LEARN : An Overview of the South China Sea Fisheries <i>Refugia</i> Initiative”	Online Technical Article	
5. SHORT FILM entitled “The South China Sea Fisheries <i>Refugia</i> Initiative ”on project Facebook page and YouTube	VDO	
6. Short film entitled “Implementing the Strategic Action Programme for the South China Sea” on project Facebook page and YouTube	VDO	
7. Fisheries <i>refugia</i> profile reports, including GIS maps and site characterizations, published for 14 priority sites	Technical paper	
8. NFRC Terms of Reference and biannual meeting reports (joint management decisions and participant lists)	Series of the Technical Paper	
9. NTSC Terms of Reference and quarterly meeting reports (scientific and technical advice and participants lists)	Series of the Technical/ Policy Paper	

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Activity 2	
Activity 3	
Activity 4	



## 6. Major Impacts/Issues

1. National execution of UNEP/GEF projects is new to many that are more familiar to projects executed by SEAFDEC on behalf of its Member Countries. This has taken some time for national teams to acknowledge and accept national-level ownership over national activities of the project, as opposed to expecting SEAFDEC staff to do the work on their behalf. This has required detailed discussions, often at the level of Director-General, to explain the difference in delivery modality whereby the national lead agencies are responsible for planning, executing and ensuring compliance with fiduciary standards of the project with respect to the use of grant funds at the national level. This issue has been resolved in most instances, although constant reminders will be necessary to ensure full national ownership such that stakeholders view this initiative as theirs as opposed to a 'SEAFDEC' project.
2. Letters of agreement are yet to be signed by two participating countries. Discussions are underway with these countries and it is hopeful that unless signed by the end of this year, can be resolved by a mission of senior staff of SEAFDEC to visit the SEAFDEC Council Director's of those countries.
3. Changing of the Responsible Focal Point at country level highly impact to the implementation process. Many times the PCU have to introduce project documents and TOR for establishment of the national Institutions to support the project Implementation.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2019

### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

		(Unit: USD)
Proposed Activity	Description of Proposed Activity	Proposed Budget (USD)
Activity 1	Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea	294,800
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	247,000
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	100,900
Activity 4	National cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea	298,100
		<b>940,800</b>

### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
Sub-activities	Fisheries <i>refugia</i> profile reports, including GIS maps and site characterisations, published for 14 priority sites
Activity 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 14 <i>refugia</i> sites accessible online
Activity 3	
Sub-activities	Awareness materials published online, and online national web portals on fisheries <i>refugia</i>
Activity 4	
Sub-activities	Joint management decisions and participant lists); and scientific and technical advice and participants lists)

**3. Schedule of Activity for the Year 2019**

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

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201301007
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Offshore Fisheries Resources Exploration in Southeast Asia		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2014 - 2019
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 642,224
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 46,940
<b>Project Leader:</b>	Siriporn Pangsorn	<b>Involved Country:</b>	SEAFDEC 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, a number of countries in the region 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 implement 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 also provide 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 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	Outcomes	Outputs	Activities
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 participate 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 5: Modification of the offshore sampling gears and technical project publications	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.  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.  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.

### 3.2 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: Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	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
	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 3: Technical Support to SEAFDEC staff(s) for participate the cruise survey and the meetings/ workshop / symposium	Sub-activity 3.1 Technical Support of SEAFDEC staff(s) to the cruise survey or 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	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
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
<b>Sub-Total Budget</b>			<b>53,900</b>	<b>38,900</b>	<b>38,000</b>	<b>35,000</b>	<b>429,504</b>	<b>46,940</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

Project has objective to provide technical support the process of implementation on the collaborative research activity 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. Training course on stock assessment by using ASPIC Model has provided to Participating Countries of the project. Stock structure by using skipjack otolith has been introduced to IMP- Countries. At this stage, Indonesia is conducting the skipjack otolith sample collection.

Project has supported the human resource development on the fisheries resources survey in Southeast Asian Waters. SEAFDEC in collaboration with Member Countries, fisheries agencies, universities and institutes carried out the Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand. The technical consultation, Regional Technical Meetings and cruise survey on marine fisheries resources and marine environment have been developed by Training Department in close collaboration with the relevant SEAFDEC Member Countries, *e.g.* Cambodia, Thailand and Viet Nam. The overall objectives of collaborative research survey are to support SEAFDEC Member Countries to conduct marine fisheries and environment data and 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 Vessel, M.V. SEAFDEC 2. The major envisage outputs of the survey are (i) Baseline data on marine fisheries resources and marine environmental situation for scientific reference as well as the status of marine fisheries resources in the Gulf of Thailand, (ii) Increasing number of experience researchers on marine fisheries resources and marine environment of SEAFDEC Member Countries, (iii) Strengthen 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.

Project has supported the human resource development on the cruise survey in the UM-17-09 expedition aboard the T/V Umitaka-Maru. This cruise survey was designed by Tokyo University of Marine Science and Technology, for the project "Integrating Study Programme of the Marine Ecosystem of the Indian Ocean Sector of the Southern Ocean", survey scheduled from 31 December 2017 to 23 January 2018. SEAFDEC Fishery Oceanographer participated in this survey. After the cruise survey, a report on the survey was prepared and submitted and a presentation on the survey will be done in December 2018.

In parallel with the promotion on sustainable resources utilization, JTF has also supported the responsible practices on fish handling technology at sea since 2013, the On-site Training Course on Proper Fish Handling Techniques Applicable to local fishing vessels organized by Training Department, from 11 to 12 October 2018 at Yangon, Myanmar and The Regional Training Course on Fish handling Technique Applicable to Various Fishing Operations in Southeast Asia conducted from 19 to 23 November 2018 at Training

Department by extending the appropriate environmental friendly fish handling tools and simple techniques applicable to maintain quality of the catch, Awareness building on the reduction of post-harvest losses for fisheries and promote food safety and minimize post-harvest losses in catching, storing and transportation process of the fish, had also major part of regional training course.

## 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 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas		4	6	1	
Sub-activity 1.2 Study on the stock structure of tuna in Sulu and Sulawesi Seas.		4	2	-	
Activity 2					
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			6		
Sub-activity 2.2 Marine fisheries resources research survey in the Gulf of Thailand		74	10		
Activity 3					
Sub-activity 3.1 Technical support of SEAFDEC staff(s) to the cruise survey or meetings/ workshop/ symposium		-	4	-	
Activity 4					
Sub-activity 4.1 Organize the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea		29	4	-	
Sub-activity 4.2 Regional activities (training/workshop/ meeting) on the improvement of the fish handling at sea		9	4	-	
Activity 5					
Sub-activity 5.1 Modified semi-pelagic and mid-water trawl net for small pelagic fisheries research resources survey			10		
Sub-activity 5.2 Set of technical documents of Joint Program on Tuna Research in Sulu and Sulawesi Seas			10		



### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
<p>Activity 1 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas</p>	<p>1) 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. 2) 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).</p>	<p>1) Scientific coordination between countries around Sulu Sulawesi Seas (SSSs) Plan of the Joint Program on 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). 2017-2019</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. SEAFDEC2 or other national research vessel</p>	<p>1) 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 2) Cruise report on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Thailand and Cambodia waters)</p>	<p>1) Agreed cruise plan of M.V. SEAFDEC 2 on Marine fisheries resource and Marine environment in the Gulf of Thailand from 17 August to 11 November 2018 2) M.V. SEAFDEC 2 finished the station survey on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (in Thailand and Cambodia waters)</p>
<p>Activity 3 SEAFDEC staff(s) or expert to participate in the Cruise Survey or meetings/workshop/symposium</p>	<p>1) SEAFDEC/TD staffs support stock assessment training course Use of ASPIC Software and Kobe Plot for Assessing Status of Fisheries Resources organize by Department of Fisheries Thailand 2) SEAFDEC staffs support Advance Fishing Technology Training course organize by Department of Fisheries Malaysia</p>	<p>1) One (1) SEAFDEC/TD staffs supported stock assessment training course in Thailand 2) Three (3) SEAFDEC staffs supported advance fishing technology training course in Malaysia</p>
<p>Activity 4 4.1 Organize the On-site Training Course on Proper Fish Handling Techniques Applicable to Local Fishing Vessels at Yangon, Myanmar (11-12 October 2018) 4.2 Organize the RTC on Fish Handling Technique Applicable to Various Fishing Operations in Southeast Asia (19-23 November 2018)</p>	<p>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</p>	<p>1) Enhanced participants 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</p>
<p>Activity 5 Modification of the offshore</p>	<p>1) Modified semi-pelagic and mid-water trawl net for</p>	<p>1) Semi-pelagic and mid-water trawl net Designs</p>

Planned activity	Expected outcome/output	Achievements
sampling gears and technical project publications	small pelagic fisheries research resources survey Set of technical documents of Joint Program on Tuna Research in Sulu and Sulawesi Seas	<ol style="list-style-type: none"> <li>2) 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. Working group of the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand</li> <li>3) Survey proposal on Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand</li> <li>4) Cruise Reports on Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand</li> <li>5) List of research works on Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand</li> <li>6) SOPs for Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand</li> </ol>

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
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	
Survey Proposal on the Collaborative Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand	Hard Copy	
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	
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	
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	
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	
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	
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	
Training Report of the On-site Training Course on Proper Fish Handling Techniques Applicable to local fishing vessels	Hard Copy	
Scientific Report entitled Stock Assessments of yellowfin tuna ( <i>Thunnus albacares</i> ), bigeye tuna ( <i>Thunnus obesus</i> ) and skipjack tuna	Hard copy	

List of completed publications for the year 2018	Type of media	Attached e-file
<i>(Katsuwonus pelamis)</i> in Sulu and Sulawesi Seas by ASPIC Model		
Technical Report on the Distribution of Fish Aggregating Devices (FADs) around SSSs	Hard copy	
Survey Report on Fisheries Resources Abundance around SSSs by Using Hydroacoustic Equipment	Hard copy	
Technical Report on Tuna spawning ground in SSSs	Hard copy	
SOPs for assessing the status of tuna resources in region or sub-region waters in Southeast Asia	Hard copy	

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

Planned activity	Evaluation/ Views from Participants
Activity 1	IMP countries agreed on Joint Program on 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) in 2017-2019.
Activity 2	Participant from 3 Member Countries <i>e.g.</i> Cambodia, Malaysia and Viet Nam agreed on the cruise plan M.V. SEAFDEC 2 on Marine fisheries resource and Marine environment in the Gulf of Thailand from 17 August from 11 November 2018. They fully supported the project, however they requested SEAFDEC to provide more technical support to their staffs as well as allocate funding to the survey in the future.
Activity 3	SEAFDEC Member Countries appreciated the support of SEAFDEC resource persons to the training courses.
Activity 4	With reference to the training report of the On-site Training Course on Proper Fish Handling Techniques Applicable to local fishing vessels, Overall subjects of training course was good contents <ol style="list-style-type: none"> <li>1. Participants were satisfied with class session and field trip</li> <li>2. Training facilities and accommodation was good</li> <li>3. Fishers requested SEAFDEC/TD for supporting on the improvement of fish handling loss on-board, by spending more days at sea would cause the quality loss to the early catches</li> <li>4. The training period and duration of this training program was appropriate.</li> </ol>
Activity 5	Publication on the Joint Program on study on the stock structure of tuna in Southeast Asia has already distributed to Member Countries. Trainee of training course and participant of meeting expressed their appreciation to SEAFDEC on the support of publication and dissemination all documents to Member Countries.

## 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 shared 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.

The proposal on Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand has been developed by SEAFDEC Training Department in close collaboration with the relevant SEAFDEC Member Countries, *e.g.* Cambodia, Thailand and Viet Nam. The overall objectives of collaborative research survey are to support SEAFDEC Member Countries to conduct marine fisheries and environment data and information collection and to promote the offshore fisheries resources exploration through the research and human resources capacity by utilization of SEAFDEC's Training and Research Vessel, M.V. SEAFDEC 2. The major envisage impacts of the survey are (i) Baseline data on marine fisheries resources and marine environmental situation for scientific reference as well as the status of marine fisheries resources in the Gulf of Thailand, (ii) Increasing number of experience researchers on marine fisheries resources and marine environment of SEAFDEC Member Countries, (iii) Strengthen 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. The major constraint on the survey was the

weather condition that was severe during the survey. Budget is also one of the major constraints for SEAFDEC Member Countries in particular immersing project similar to this Collaborative Survey. Countries have trouble with funding support to analyze data that requires further consideration.

Regional training course on fish handling technique, applicable to various fishing operation in Southeast Asia had 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. It was obviously seen that the 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.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
Sub-activity 1.1 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	Project will conduct 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 for Philippines.	5,000
	Project will conduct 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.	15,000
Sub-activity 1.2 Study on the stock structure of tuna in Sulu and Sulawesi Seas.	Project will conduct the training on preliminary study on the stock structure of tuna in SEA, Skipjack tuna stock structure study by using otolith for Malaysia, and Philippines. And in case of Indonesia, the samples of otolith will be sent to Japan for analysis.	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. SEAFDEC2 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 will be conducted on the first quarter of year 2019.	1,200
Activity 3		
SEAFDEC staff(s) or Expert to participate in the Cruise Survey or meetings/ workshop/symposium	Invite resource person to be an advisor on identification of fish larvae sample which collected from the collaborative research survey on marine fisheries resources and marine environment in the Gulf of Thailand in 2018.	2,240
Activity 4		
Regional activities (Training/Workshop/Meeting) on the improvement of the fish handling at sea	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. Follow up activities plan to conclude from the regional training/workshop. In addition, project will support the human resources development of post harvesting technology in less harvest developing countries.	15,000

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 5		
Sub-activity 5.1 Technical project publications	In order to promote the results of the project, set of technical research reports will be published and disseminated through postal mail to Member Countries and website.	1,500
Sub-activity 5.2 Modification of the offshore sampling gears	-	0

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	<ol style="list-style-type: none"> <li>1. Technical papers on Tuna Stock Assessment for YFT, BET and SKJ resources in SSSs by using GLM CPUE standardization, ASPIC, and Kobe Plot</li> <li>Results and report of Skipjack Otolith collection in the pilot site of SSSs Member Countries</li> </ol>
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	<ol style="list-style-type: none"> <li>1. Support survey plan development, monitor and evaluation progress of fisheries resource survey in SEA Countries</li> <li>2. Report on the consultation meeting to prepare the cruise of M.V. SEAFDEC 2 in SEAFDEC Member Countries</li> <li>3. Cruise plan of M.V. SEAFDEC 2 operated in year 2019</li> <li>4. Cruise report of M.V. SEAFDEC 2 operated in year 2019</li> </ol>
Activity 3 SEAFDEC staff(s) or Expert to participate in the Cruise Survey or meetings/ workshop/symposium	<p>Expert on the Fish Larvae identification has completely checked with the scientific result on Larvae Identification Research of SEAFDEC</p> <p>Expert on fish identification will be finished the research paper on the fish identification in Cambodia waters caught by trawler</p>
Activity 4 Regional activities (Training/Workshop/Meeting) on the improvement of the fish handling at sea	<ol style="list-style-type: none"> <li>1. Human resource development on the reduction of post-harvest losses which will help reinforce extension and promotion activities in their respective countries and identification and quantification the root cause of losses fish handling at sea and the identify implement loss reduction measure by organizing the Regional activities (Training/ Workshop /Meeting) on the improvement of the fish handling at sea.</li> </ol>
Activity 5 Modification of the offshore sampling gears and technical project publications	<ol style="list-style-type: none"> <li>1. Compilation and revision of the technical handbook and guideline on sampling gears and survey methodology for offshore fisheries resources exploration was continued.</li> <li>2. Modification for offshore sampling gears of SEAFDEC research vessels, M.V. SEAFDEC, M.V. SEAFDEC 2 and M.V. Plalung</li> <li>3. Publication and dissemination of the new/ revised handbook of offshore sampling gears</li> <li>4. Publication and dissemination of the results on the Joint Program on Tuna Research in Sulu and Sulawesi Seas</li> </ol>

## 3. Schedule of Activity for the Year 2018

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Activity 2												
Activity 3												
Activity 4												
Activity 5												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR THE YEAR 2018  
AND  
PROPOSED ACTIVITIES FOR THE YEAR 2019**

Project ID: 201301008			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Enhancing Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region: Improving the Data Collection of the Commercially-exploited Aquatic and Threatened Species		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2004 - 2019
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Viet Nam
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 250,700
<b>Project Partner:</b>	MFRDMD	<b>Budget for 2019:</b>	USD 40,000
<b>Project Leader:</b>	Sukchai Arnupapboon	<b>Involved Country:</b>	SEAFDEC Member Countries

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Descriptions

Since the past decades, sharks and rays have become one of the valuable fishery resources and commodities of 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 CITES-Appendix II after the Seventeenth Conference of the Parties (CoP17), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). International trading of CITES listed sharks and rays species are regulated by CITES Management Authority by permit.

However, some CITES listed sharks and rays species are considered as common species and caught regularly during fishing activities in SEAFDEC Member Countries (MCs). In order to respond to this issues, SEAFDEC collaborates with SEAFDEC MCs has developed to improve data collection of sharks and rays project. It aims to enhance capability of fishery sectors in **compiling and utilizing** fishery statistics and information of sharks and rays since year 2013. The main envisage outcome of the project is that SEAFDEC MCs are able to collect sharks and rays data at species level as well as sharks and rays data will be used to fill the most important section in Non-detrimental Findings (NDFs) documents, to support Member Countries to develop the National Plan of Action (NPOA) of Sharks and rays and to provide scientific evidence particularly stock assessment for sharks and rays fisheries management sustainability.

### 2. Background and Justification

In 2013, the project activities focused on the improvement of data and information collection for commercially-exploited aquatic species of sharks. This was to follow-up the output from a series of events, including the technical meetings in Thailand in 2011 and 2012 organized by SEAFDEC/TD, and the Regional Training Course on Shark Species Identification organized by SEAFDEC/MFRDMD in early 2012. The outputs from these showed that information on shark stock status in Southeast Asian Countries 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. Moreover, insufficient policy and financial support on research and management of sharks were common key issues in the region. This project aims at continuing the support of the MCs to improve quality and timeliness of data/information on sharks.

In 2014, the project activities emphasized on alleviating problem of shark data collection by improving capacity of species identification through organizing regional workshops for ASEAN Member Countries. The aim of the meeting was training to trainer, who could able to pass knowledge from workshops to their local shark landing operators. Shark data landing at pilot sites of some SEAFDEC Member Countries was initiated in August 2014 under technical support and monitored by TD and MFRDMD.

In 2015, the project organized the Regional Technical Meeting on Shark and Ray Data Collection and Project Planning Year 2015-2016, in order to compile and analyze shark data as regional level. Output of the meeting will be reported as regional shark data. Participating Countries of the project have agreed on the format and template for shark and ray data collection work plans of Participating Countries in year 2015-2016. Standard Operational Procedure (SOP) of shark and ray data collection will be developed and verified by Participating Countries. With financial support from 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 seven (7) ASEAN Member States, namely: Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam. Sharks Data Collection in Southeast. Major output of the project is to improve human resources capacity of ASEAN Member States on data collection and identifying the species of sharks and rays for better management and enforcement of the necessary management measures.

In 2017, the project emphasizes to determine appropriate model for converting sharks and rays data into sharks and rays stock information in order to present such scientific information to fishery manager. Additionally, in this year, the Project continuously supported data collection in Cambodia because sharks and rays data in this country is still insufficient for stock assessment and it was also found that Cambodia still needs more technical support on building human resources capacity on shark identification into species level.

In year 2018, the project organized training workshop on stock assessment of sharks and rays. The aim of this training is capacity building with SEAFDEC MCs to be able to utilize data for fisheries management. Furthermore, the Project also initiated to support data collection for three years more from 2018-2020 at three landing sites in three countries, namely: Indonesia, Malaysia and Thailand. Lastly, this project supported Member Countries to formulate the NPOA-Shark.

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

#### 3.1 Objectives, Outcome and Output 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: 1. National data collection system on landing sharks and rays. 2. Sharks and rays resource management plan.	Output 1: a) Human resources on sharks and rays identification and data collection. b) Human resources on Sharks and Rays resource status assessment.	Activity 1: Human resource development on data collection procedure, identification of species and assessment on shark and rays 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 for landing of sharks and rays.	Output 2: a) Data set of landing Sharks and Rays available at species level b) Sharks and rays database c) National network on Shark and Ray Identification	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 Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection
	2.2) Data collection for management and conservation of Sharks and Rays (Data quality to investigate stock assessment of Sharks and Rays).	a) Appropriate method to utilize data to examine shark and ray resources status and fishery status based on ASEAN's existing data.	Sub-activity 2.3 Improve quality of data collection to support fisheries management ( Determining and Training Workshop on appropriate model for assessing resource

Objectives	Outcomes	Outputs	Activities
		b) Regional network on sharks and rays identification and stock assessment.	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 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: a) National report on sharks and rays data collection b) Regional analysis of the sharks and rays landing in the Participating Countries c) 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	During year 2013-2016, project activities have focused on improvement of data and information collection for sharks and rays. Series of regional meeting and training workshop were organized in collaboration between SEAFDEC/TD and SEAFDEC/MFRDMD in order to improve human resources capacity in data collection and identification at the species level for fisheries researchers of SEAFDEC MCs.  Since year 2018, capacity building to utilize sharks and rays data have been focused to provide scientific information for formulating management plan in advance.
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	To strengthen on accuracy of data collection and identification, resource persons from SEAFDEC/TD, SEAFDEC/MFRDMD and Expert group in Southeast Asia transferred knowledge on data collection and species identification, especially on the species listed by CITES to enumerators of Project Participating Countries.  In order to ensure the implementation of shark landing data is systematically and accurate collecting at the selected landing sites, SEAFDEC/TD and MFRDMD monitored enumerator at the landing site and also validate of data in participating countries.  To improve quality of data collection to support fisheries management, determining on appropriate stock assessment model for sharks and rays was conducted with technical support from shark experts in Southeast Asia and Japan. The existing landing data would be converted to valuable information (sharks and rays stock status) and deliver to policy maker.
Activity 3: Sub-activity 3.1 Information dissemination Sub-activity 3.2 Participate to Relevant Regional and International Forum	Reports/publications of the regional sharks and rays data collection will be disseminated to provide the information to manage sharks and rays fisheries. Reports will be used as a reference by SEAFDEC Departments, Member Countries, fisheries-related agencies and organizations as well as the general public.  In order to support management on the utilization of sharks and rays, SEAFDEC/TD in collaboration with SEAFDEC MFRDMD will establish a database system to support fisheries manager.



Activities	Description
	This activity has also been collaborated with other relevant initiatives, organizations, and partners, in particular with the issues related to sharks data collection. In this connection, the activity includes participation of staff in the regional and international meeting or forums, e.g. WCPFC, IOTC, CITES, etc. to monitor on the current issues that has a significant information to sustainable utilization of Sharks and Rays.

### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2019

(Unit: USD)

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	25,000
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	6,000
	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	6,000
	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
<b>Total</b>		<b>32,000</b>	<b>32,000</b>	<b>32,000</b>	<b>30,000</b>	<b>47,500</b>	<b>64,200</b>	<b>40,000</b>

## PART II: ACHIEVEMENTS OF 2018 PROJECT IMPLEMENTATION

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

The major achievement of Project implementation in year 2018 is the activities of the capacity building on sharks and rays stock assessment by Yield Per Recruit (YPR) model. The activities were conducted with seventeen (17) participants from eight (8) SEAFDEC Member Countries, namely: Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam. The training course was specifically designed for converting landing data to stock information, particularly sharks and rays

resources status. All participants improved their skills and knew method to determine overfishing situation and also could provide scientific recommendations for management based on the result of YPR model.

Regional network of shark stock scientist and researcher has been established and strengthened. The online communication to share information was well implemented.

Additionally, three landing sites of participating countries were supported for sharks and rays data collection. Two sites selected as base of demersal sharks and rays data and another as base of pelagic sharks and rays data. With guidance from project advisors, Twelve (12) months of sharks and rays data collection starting July 2018 to June 2019 have been 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 in the future.

## 2. Information of the Present Year Activities 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		17	6	2	32,300
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		6	2		13,650
Sub-activity 2.2 Monitoring process in the participating countries on sharks and rays data collection		6	2		9,300
Sub-activity 2.3 Improve quality of data collection to support fisheries management					
Activity 3: Information dissemination					
Sub-activity 3.1 Information dissemination					3,950
Sub-activity 3.2 Participate to Relevant Regional and International Forum					5,000

## 3. Achievements and Expected Outcomes/Outputs of the Activity

Planned activities	Expected outcomes/outputs	Achievements
Activity 1 Human resource development programs through organizing training workshop on Sharks and Rays stock assessment by YPR model	Human resources on sharks and rays resource status assessment and formulate NPOA based on information of sharks and rays resource status assessed by YPR model	1. Capacity building on Sharks and Rays stock assessment model to national researchers.
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 Indonesia, Malaysia and Thailand	1. Report of technical meeting on sharks and rays data collection Planning 2018-2019 2. Report of sharks and rays data from July 2018 - June 2019 3. Certify and improve quality of data collection	1. One-year data collection in Indonesia, Malaysia and Thailand from July 2018 to June 2019. 2. Taxonomic information of sharks and rays caught in Indonesia, Malaysia and Thailand. 3. National data sets had been validated by the regional experts. 4. Participating countries initiated to utilize

Planned activities	Expected outcomes/outputs	Achievements
2.1.1. Technical Meeting on Sharks and Rays Data Collection Planning 2018-2019 2.1.2. Sharks and rays data collection in Indonesia, Malaysia and Thailand Sub-activity 2.2: Monitoring process in the participating countries of sharks and rays data collection	4. Capacity of participating country to use sharks and rays' database	data as scientific information in order to develop sharks and rays fishery management plan. 5. Establishment of sharks and rays database in the Southeast Asian region.
Activity 3 Sub-activity 3.1 Information dissemination  Sub-activity 3.2 Participating in training workshop for sharks and rays	1. Shark NPOA was formulated in Thailand	1. SEAFDEC researcher transferred sharks and rays information and knowledge to Southeast Asian countries.

#### 4. List of Completed Publications and Others

List of completed publications for the year 2017	Type of media	Attached e-file
1. Report of Technical Meeting on Sharks and Rays Data Collection Planning 2018-2019	Hard copy	
2. Report of Training Workshop on Sharks and Rays Stock Assessment by YPR Model	Hard copy	
3. Handbook for YPR model	Hard copy	
4. National report on Brownbanded Bambooshark ( <i>Chiloscyllium punctatum</i> Müller and Henle, 1838) Stock Assessment Using Yield per Recruit Model in Cambodia	Hard copy	
5. National report on pelagic thresher shark ( <i>Alopias pelagicus</i> ) stock assessment using Yield per Recruit Model in Indonesia	Hard copy	
6. National report on Spadenose ( <i>Scoliodon laticaudus</i> ) stock assessment using Yield per Recruit Model in Myanmar	Hard copy	
7. National report on Brownbanded Bambooshark ( <i>Chiloscyllium punctatum</i> Müller and Henle, 1838) Stock Assessment Using Yield per Recruit Model in Malaysia	Hard copy	

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

Planned activities	Evaluation/ Views from Participants
Activity 1: Human resource development programs	
Sub-activity 1.1 Human resource development programs	Yield Per Recruit Model (YPR model) would properly to be the most appropriate method to assess status of sharks and rays based on existing data condition in Southeast Asian region. It could provide valuable information to manage sharks and rays resources, particularly overfishing situation information.
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 Countries	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.

Planned activities	Evaluation/ Views from Participants
Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection	Database of sharks and rays was developed and local enumerator monthly inputted data into the database. In this regards, it could reduce amount of time for managing data and also could analyze data in a variety of ways.
Sub-activity 2.3 Improve quality of data collection to support fisheries management	
Activity 3: Information dissemination	
Sub-activity 3.1 Information dissemination	SEAFDEC's researchers were able to share knowledge and experience during the process of formulating NPOA of sharks in Thailand.

## 6. Major Impacts/Issues

*“Understanding on growth rate of fish is among the fundamental aspects that needed for fisheries management. Knowing on growth rate of the captured species can provide valuable insight its life history event, which can be further used to investigate the optimum fishing event for sustaining the fisheries”*

Even though, the end of this year project sharks and rays resource status information could be assessed by YPR model based on existing data. However, its accuracy is unsatisfied due to growth rate based on length frequency from existing data was not smooth, particularly in pelagic shark. This problem occurred because catch of sharks and rays was not a variety of sizes. Sharks and rays caught by longline were almost same size. With this regard, growth rate determining by using vertebra is more appropriate in this situation since it could determine growth rate with less variety of the size and number of specimen. The concern is SEAFDEC Member Countries researchers are limited of knowledge for determining growth rate by using vertebra. Therefore, the project needs to train determining growth rate by using vertebra through organizing training workshop.

Sharks and rays data at species level has been available for twelve (12) months only. It is not enough to make Non-detrimental Findings (NDFs) documents and develop NPOA-sharks and rays. Therefore, if possible, project should support data collection continuously for two more years from 2018-2020.

## PART III: PROPOSED ACTIVITIES FOR THE YEAR 2019

### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)		
Proposed Activities	Description of Proposed Activities	Proposed Budget
Activity 1. Human resource development programs		
Sub-activity 1.1 Human resource development programs	Capacity building on Age determination by using vertebra of sharks and rays. It will be conducted with the aim to increase accuracy of assessment for resource status.	25,000
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	Two landing sites of participating country will be supported for sharks and rays data collection. One site selected as base of demersal sharks and rays data and another as base of pelagic sharks and rays data.	6,000
Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection	In order to ensure the implementation of sharks and rays data at the landing sites, data collection is systematically and accurate at the selected landing sites. SEAFDEC/TD and MFRDMD will technically support in participating countries and enumerator that will be	6,000

Proposed Activities	Description of Proposed Activities	Proposed Budget
	requested to monthly input data into database for validation.	
Sub-activity 2.3 Improve quality of data collection to support fisheries management		
Activity 3 Sub-activity 3.1 Information dissemination	Disseminate regional field guide book on shark and ray identification, SOPs on sharks and rays data collection and sharks and rays information in Southeast Asian region.	500
Sub-activity 3.2 Participate to Relevant Regional and International Forum	In order to monitor on the current issues that significant to sustainable utilization of sharks, responsible researcher of SEAFDEC will participate the regional/international forums <i>e.g.</i> WCPFC, IOTC, etc.	2,500

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activities	Expected Outcomes/Outputs of Activities
Activity 1 Human resource development programs	Researchers of SEAFDEC MCs understand the study method of age determination and could be able to make growth rate based on vertebra method. Expected Output is to investigate the optimum fishing event for sustaining the fisheries.
Activity 2 Support SEAFDEC Member Countries to implement shark data collection at landing site(s)	
Sub-activity 2.1 Support SEAFDEC Member Countries to implement shark data collection at landing site(s)	Set/Verified data collection of shark landing at the selected sites in participating countries.
Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection	Sharks and rays database in the Southeast Asia region/ Capacity of participating country to use sharks and rays' database.
Sub-activity 2.3 Training workshop to improve quality of data collection to support fisheries management	
Activity 3 Information dissemination	
Sub-activity 3.1 Information dissemination	Dissemination of sharks and rays information to SEAFDEC MCs
Sub-activity 3.2 Participate to Relevant Regional and International Forum	Report on the regional or global interest in current issues that significant to sustainable utilization of sharks and rays presented in the Meeting on Sharks and Rays Data Collection

## 3. Schedule of Activities for the Year 2019

Proposed Activities	2019											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1 Human resource development programs												
Sub-activity 1.1 Human resource development programs												
Activity 2												

Proposed Activities	2019											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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												
Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection												
Activity 3 Information dissemination												
Sub-activity 3.1 Information dissemination												

Remarks: Activity 2.1 will be conducted from July 2019 - June 2020

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

		Project id: 201301008	
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	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		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2013-2019
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Viet Nam
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 375,616
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 47,000
<b>Project Leader:</b>	Ms. Thanyalak Suasi	<b>Involved Country:</b>	SEAFDEC Member Countries

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

The project would be further carried out support Member Countries by review the problems and constraints in fisheries data collection in coastal small-scale and inland fisheries at national level and identify the key issues in fisheries data collection that should be addressed by the countries through the regional workshop. The project will be supporting Member Countries through onsite training “Facilitating Fisheries Information Gathering Through Introduction of Community-based Resources Management/Co-management”. This training course addressed the concept of Community-based Resources Management/Co-management for Provincial officers of Member Countries. As well Project will be monitoring and additional support by assisted fisheries officers of Member Countries to practice in collecting and analyzing information from fisheries community for policy formulation, also to design coastal and inland fishery management plans by selected the appropriate participatory mechanism of CBRM/Co-management approach, that suit the local condition.

### 2. Background and Justification

In the Southeast Asian region, coastal and inland fisheries are other areas where the available fishery statistic, are recognized to be under-reported due to the nature of fisheries as being multi-species and involving large number of small-scale fishers. It is therefore also necessary to improve data and information collection methodology, acknowledged the concept and theoretical framework of fisheries management, *e.g.* by involving local communities, local officers, *etc.* In order that, the data could better reflect the importance of coastal and inland fisheries and could be used as a basis for planning and management of fisheries. 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: *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.* Then, project on 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* is necessary for SEAFDEC Member Countries. Despite the importance of this project, it so far has been conducted in a limited pilot sites implementation. In addition, some follow-up activities and more pilot site are preferable after conducting on-site trainings in order for the project to be more effective. The project will terminate in year 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: 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, and 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 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	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



Activity	Description
fisheries activity information	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 2013-2019

(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	20,000
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 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	22,200
	Sub-activity 3.2:			17,000	6,000	22,800	6,000	4,800

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
	Study on appropriate activities sustainable for CBRM in fisheries community in Southeast Asia.							
<b>Sub-Total</b>		<b>52,000</b>	<b>70,000</b>	<b>57,000</b>	<b>40,000</b>	<b>22,800</b>	<b>86,816</b>	<b>47,000</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

There have been many attempts in SEAFDEC's Member Countries to implement pilot projects through CBRM/Co-management to deal with their situation. In 2018, the project conducted the follow-up activities at the pilot site in Cambodia with providing the technical support for conservation zone management and this site finished in this year. However, the project has implemented the activity focusing on promote CBRM/Co-management in the fishing communities of the pilot site in Lao PDR, Nam Souang Reservoir, Vientiane and Khammouane Province. That would be able to assist fisheries officers to introduce CBRM/Co-management, as well as in order to design the fishery management plans under the appropriate participatory mechanism of co-management approach, the local fisheries officers could learning by doing and strengthen their capacity through conduct the activities at the project site.

### 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 Seminar on Improvement CBRM/Co-Management approach in Coastal small-scale and Inland Fisheries of the Southeast Asian Region	IV. Policy	-	-	-	Cancel this activity in 2018
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 request on-site training from MCs
Activity 3: Monitoring and Evaluation					
3.1.1 Monitoring and evaluation CBRM/Co-Management Project in Chong Khaneas, Siem Reap, Cambodia, 25-27 June 2018	I. Research	12	3	-	2,778.56
3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR - 29 Jan - 3 Feb 2018 - 21 - 25 May 2018 - 11 - 16 June 2018 - 25-29 June 2018	I. Research	70 3 30	TD 3 IFRDMD 1 3 1	2 (Tokyo University)	5,851.86 4,729.67 12,012.04 6,600.00
3.1.3 Monitoring and facilitating the CBRM/Co-management the pilot site in Viet Nam	I. Research	-	-	-	-

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
3.1.4 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR - 12-15 Feb 2018 - 27-30 March 2018 - 11-13 June 2018 - 9-14 July 2018	I. Research	54	4	2 (Tokyo University)	5,064.94
		20	1	-	7,153.98
		46	2	-	7,400.16
		24	2	-	5,000
3.2.1 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand	I. Research	33	-	-	1,481.48

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1: Regional Seminar on Improvement CBRM/Co-Management approach in Coastal small-scale and Inland Fisheries of the Southeast Asian Region	The resolution problem and constraints of promotion CBRM/Co-management from seminar and lesson learned will further apply among Member Countries	This activity was re-scheduled to be organized in year 2019 after project termination 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 2018. However the project organized the training course on "Introduction on Simple Stock Assessment in Inland Fisheries" for SEAFDEC staff and others in order to support conducting the project activity related to assessment of the fisheries resources.
Activity 3: Monitoring and Evaluation 3.1.1 Monitoring and evaluation CBRM/Co-Management Project in Chong Khneas, Siem Reap, Cambodia	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 project announced to finish the activities in Chong Khneas Commune. However, 12 fishers attended the local meeting obtaining the technical suggestion from SEAFDEC on the management plan of Chong Kneas Commune especially management the conservation zone and eco-tourism activity.
3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR		The rules and regulations for Nam Xouang Reservoir were revised by the Fisheries Management Committees. The buoys and sign boards for conservation zone demarcation and informing the local fishers on rules and regulations were installed in the reservoir. Furthermore, the mobile hatchery and fish releasing were implemented and the data collection has been collected for fishery and socio-economic status, fish identification and stock assessment as well.
3.1.3 Monitoring and facilitating the CBRM/Co-management the pilot site in Viet Nam		The project proposal was proposed to Viet Nam for consideration.

<b>Planned activity</b>	<b>Expected outcome/output</b>	<b>Achievements</b>
3.1.4 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR		The Fisheries Management Committee (FMC) and conservation zone were established at a project site called Banmai Namprakan village. They conducted the surveillance activity to protect conservation area by themselves. The FMC members (18 persons) gained knowledge and experience on the FMC management system from study tour to Bolikhamsai province. The fish releasing activity was conducted to build awareness of community members for conservation the fisheries resources. The project has promoted alternative livelihood by introducing fish processing technique to the women group. The statistic and fish market survey were conducted to collect fisheries data as supporting information to develop the project activities.
3.2.1 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand		The stock assessment research was conducted by the enumerator to undertook the data collection on landing catch every month and delivered landing data to SEAFDEC/TD for further analysis. In addition, 32 voluntary fishers have participated in data collection by recording their catch data into logbook, this data is one of the key references to support the stock assessment research.

#### 4. List of Completed Publications and Others

<b>List of completed publications for the year 2018</b>	<b>Type of media</b>	<b>Attached e-file</b>
1. Report on Monitoring and Evaluation CBRM/Co-Management Project in Chong Khneas, Siem Reap, Cambodia (25-27 June 2018)	Hard copy and PDF	
2. Report on Monitoring and Facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR (29 Jan – 3 Feb 2018, 21 - 25 May 2018, 11 - 16 June 2018, 25-29 June 2018)	Hard copy and PDF	
3. Report on Monitoring and Facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR (12-15 Feb 2018, 27-29 March 2018, 11-13 June 2018, 9-14 July 2018)	Hard copy and PDF	
4. Presentation on Status of Fisheries Resources in Nam Oon Dam Sakon Nakhon, Thailand, (Feb-Oct 2017)	Hard copy and PDF	

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

<b>Planned activity</b>	<b>Evaluation/ Views from Participants</b>
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 Evaluation Sub-activity 3.1:	-

Planned activity	Evaluation/ Views from Participants
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

1. 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.
2. 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.
3. 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.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2019

### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1: Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region	The workshop has reviewed the resolution problems and constraints of promotion CBRM/Co-management in coastal small-scale and inland fisheries and share the lesson learned and experiences of project implementation as well as Guidelines/toolkit on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region will be developed from this workshop. The workshop will be organized for three days and invite one participant from Member Countries include resource person from Japan.	20,000
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM including the methodology on gathering fisheries activity information	None of activities are proposed in year 2019	-
Activity 3: Monitoring and Evaluation		
3.1.1 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR	The produce extension media such as booklet, brochure, poster as well as the on-site meeting with fishers around Nam Xouang Reservoir will be conducted to promote the roles and regulations in Nam Xouang Reservoir.	9,000
3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR	The project will enhance livelihood through strengthen the knowledge provide the training course on aquaculture technique for FMC member of Nam Prakan Village. The target species for culture were catfish and Common Climbing Perch. However, the project will support the equipment for fish processing and Aquaculture business of these group. The statistic and marketing survey will continue for data collection after that the data will send to SEAFDEC for data analysis.	13,200
3.2.1 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon,	The local workshop will conduct at the pilot site, Nam Oon Dam, Sakon Nakhon Province to modify and develop the appropriate fisheries management measure such as close	4,800

Proposed Activity	Description of Proposed Activity	Proposed Budget
Thailand	season, fishing gear used as well as promote the fishing boat registration and fishing gear licensing to the fishers in the fishing community. The local workshop will organize for two days and invite 35 representatives of fishers around Nam Oon Dam to attend this workshop	

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1: Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region	The lesson learned and experience on improvement data collection through CBRM/Co-management will be shared among Member Countries that they and apply the lesson learned to their countries. The Guidelines/Toolkits of data collection methods in coastal and inland fisheries will be developed and published.
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBRM including the methodology on gathering fisheries activity information	None of activities are implemented in year 2019
Activity 3: Monitoring and Evaluation 3.1.1 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR	The extension medias for rules and regulations will be published and distributed to local people/fishers around Nam Xouang Reservoir. The 60% of fishers around the reservoir understand the rules and regulations including the co-management activities in their area.
3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR	The Fisheries Management Committee members will gain knowledge on Aquaculture technique that will support them to earn alternative income for their better livelihood. The result of catch data can be useful for planning development and for fisheries management.
3.2.1 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand	The appropriate fisheries management measure will be developed by fishers themselves and implemented in Nam Oon Reservoir. The fishers will be encouraged to register their fishing boat and fishing gear including fisher registration. The research on stock assessment will be developed and further published.

## 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1: Regional Workshop on Improvement of Fisheries Information Collection 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 including the methodology on gathering fisheries activity information												
Activity 3: Monitoring and Evaluation 3.1.1 Monitoring and facilitating the CBRM/Co-management the pilot site in												

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
Vientiane, Lao PDR												
3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR												
3.2.1 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201304002
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Malaysia
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 316,065
<b>Project Partner:</b>	TD, Secretariat	<b>Budget for 2019:</b>	USD 33,180
<b>Project Leader:</b>	Raja Bidin bin Raja Hassan until February 2017 Mohammad Faisal bin Md Saleh from March 2017.	<b>Involved Country:</b>	Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

The project involves compilation and comparison of annual and/or monthly CPUE where data are available for the last three decades in the region, comparison 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 construction 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 will make its first attempt to examine the trend of resource level using CPUE for the last three decades. At the same time, MFRDMD will review and compare purse seine fishery management systems including TAC systems and other management measures in the world to examine which management system/measure is applicable for management of small pelagic fishery in the region. Moreover, the genetic study intends to verify the extent of connectivity of commercially important pelagic species targeted by purse seine fisheries and provide with scientific background for concerted management actions of SEAFDEC Member Countries for shared stocks of small pelagic species. At the end of the project, MFRDMD will review available information including stock levels, and MFRDMD and Member Countries will 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* sp. 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, management of purse seine fisheries is still neglected because information of stocks and biological characteristics are lacking. For sustainable use of these resources, formulation of a management plan is required. Therefore, we need to develop the best way to assess the size and state of the stocks for accurate TAC allocation and to find the most applicable TAC system for the purse seine fisheries in the region. Considering the likeliness of these stocks shared by countries bordering with the same ecosystems both in the Andaman Sea and the South China Sea, effective management of shared stocks requires management measures to be taken for the whole coverage area that is beyond national waters.

This program 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 this project in comparative studies for management of purse seine fisheries, especially having several options for management strategy of purse seine fisheries in the region, SEAFDEC proposes 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 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	Outcomes	Outputs	Activities
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 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					

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
	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
<b>Sub-Total Budget</b>		<b>60,000</b>	<b>58,260</b>	<b>40,972</b>	<b>47,773</b>	<b>33,933</b>	<b>41,947</b>	<b>33,180</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

MFRDMD continuously collected updated information on purse seine fisheries from Member Countries as well as examined the data for regional synthesis of purse seine fisheries in the region to suggest possible suitable stock indicator and management systems in the Member Countries.

MFRDMD had conducted the Internal Workshop for this project in UiTM Hotel, Dungun, Terengganu on 12-14 February 2018. The purpose of this workshop was to discuss the catch and effort data by using other method/model than Allowable Biological Control (ABC) method (Rule 2-1 and Rule 2-2). In this workshop, the Surplus Production Model was clearly explained by local Resource Person as useful analysis tool. We also agreed to use Catch per Trip as CPUE Index because of the consistencies of yearly trend and data availability compared to other CPUE index. Subsequently, output generated during this workshop became main precursor in the regional analysis for this project.

In addition, the Report of the 3<sup>rd</sup> CEM (2017) will be published in September 2018. Hokkaido University, Japan in collaboration with MFRDMD has planned to conduct two preliminary surveys on species composition of purse seine fisheries in 5 major landing centers along the East Coast of Peninsular Malaysia from 1<sup>st</sup> – 10<sup>th</sup> July 2018 and 24<sup>th</sup> September – 3<sup>rd</sup> October 2018.

MFRDMD will carried out the “Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region” on 18-19 September 2018 in Melia Hotel, Kuala Lumpur. The meeting will be attended by the representatives from Brunei DS, Cambodia, Indonesia, Malaysia, Myanmar, The Philippines, Thailand and Viet Nam as well as resource persons from Japan and Malaysia. The meeting will share the latest information about landings and CPUEs of purse seine fisheries in the region and understanding the population structure for *Amblygaster sirm*.

An extra number of samples were collected from Ranong (Thailand) with the collaboration with Kasertsart University in June 2018. This is to confirm the finding from previous analysis of the genetic structure of spotted sardinella between South China Sea and Andaman Sea. Besides, an extra DNA marker (COI marker) was also selected to support the current result. Analysis of mtDNA Cytb method from 10 locations of 323 specimens (Muara, Kuantan, Kuching, Kudat, Palawan, Zambalas, Songkhla, Ranong, Banda Aceh and Pekalongan) yielded a clearly two separated groups with high genetic distance between South China Sea (including Banda Aceh (southern Andaman Sea) and Ranong (northern Andaman Sea). This is also supported with other gene, mtDNA Cytochrome C oxidase subunit for 8 locations (Muara, Kuantan, Kuching, Kudat, Palawan, Zambalas, Songkhla and Ranong) of 118 specimens. The finding was discussed during a workshop in Langkawi in August 2018 and the final the result will be presented during CEM 2018.

There are many factors that could have attributed to the existence of the sub-species or taxon such as : hybrid, faster rate of genetic evolution, discovery of new or cryptic species.

## 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 1.3: Comparison of TAC systems in the world	Information		3MFRDMD	2 (Hokkaido)	8,908
Activity 2					
Sub-activity 2.4: Data compilation and analysis (Genetic)	Research		4MFRDMD		9,825
Activity 3					
Sub-activity 3.1: Core Expert Meeting/Workshop	Information	20	6MFRDMD, 1TD, 1SEC,	4 (admin & drivers)	23,214

## 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.3: Comparison of TAC systems in the world	Comparison of TAC systems and management measures for purse seine fishery	MFRDMD had conducted the Internal Workshop for this project in UiTM Hotel, Dungun, Terengganu on 12-14 February 2018. The purpose of this workshop was to discuss the catch and effort data by using other method/model than Allowable Biological Control (ABC) method (Rule 2-1 and Rule 2-2). In this workshop, the Surplus Production Model was clearly explained by local Resource Person as useful analysis tool. We also agreed to use Catch per Trip as CPUE Index because of the consistencies of yearly trend and data availability compared to other CPUE index. Subsequently, output generated during this workshop became main precursor in the regional analysis for this project.

Planned activity	Expected outcome/output	Achievements
		In addition, the Report of the 3rd CEM (2017) will be published in September 2018. Hokkaido University, Japan in collaboration with MFRDMD has planned to conduct two preliminary surveys on species composition of purse seine fisheries in 5 major landing centers along the East Coast of Peninsular Malaysia from 1st – 10th July 2018 and 24th September – 3rd October 2018.
Activity 2		
Sub-activity 2.3: Genetic study	Genetic population analysis of spotted sardinella ( <i>Amblygaster sirm</i> ).	An extra number of samples were collected from Ranong (Thailand) with the collaboration with Kasertsart University in June 2018. This is to confirm the finding from previous analysis of the genetic structure of spotted sardinella between South China Sea and Andaman Sea. Besides, an extra DNA marker (COI marker) was also selected to support the current result. The finding was discussed during a workshop in Langkawi in August 2018 and the final the result will be presented during CEM 2018.
Activity 3		
Sub-activity 3.1: Core Expert Meeting/Workshop		MFRDMD will carried out the “Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region” on 18-19 September 2018 in Melia Hotel, Kuala Lumpur. The meeting will be attended by the representatives from Brunei DS, Cambodia, Indonesia, Malaysia, Myanmar, The Philippines, Thailand and Viet Nam as well as resource persons from Japan and Malaysia. The meeting will share the latest information about landings and CPUEs of purse seine fisheries in the region and understanding the population structure for <i>Amblygaster sirm</i> .

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1. Meeting report for “The Third Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region, 2017”	PDF, Print	

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

Planned activity	Evaluation/ Views from Participants
-	

#### 6. Major Impacts/Issues

For regional synthesis of purse seine fisheries information, Member Countries are requested to submit the updated data within the agreed time frame. Aside from that, full regional analysis was also impacted by data reliability and validity.

For genetic study of *Amblygaster sirm*, samples from Myanmar is very important to get a better picture of population structure of spotted sardinella around Andaman Sea.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

		(Unit: USD)
Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 4		
Sub-activity 4.1: Recommendation for fisheries Management	SEAFDEC/MFRDMD will continue synthesizing regional information of purse seine fisheries based on the updating data given by MCs after the 4 <sup>th</sup> CEM.  Study visit at Hokkaido University in collaboration under “Survey of species composition at major landing ports in East Coast of Peninsular Malaysia”.  Internal meeting/workshop on analyzing and synthesizing regional data.  Otolith workshop or Stock Assessment workshop at Thailand or other country.	23,420
Sub-activity 4.2: Preparation and publishing of terminal report	Data of catch and effort of regional purse seine fisheries and stock structures of shared small pelagic fish will be analyzed and synthesized. The findings will be published in the terminal report.	9,760

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 4	
Sub-activity 4.1: Recommendation for fisheries Management	Expect to benefit from attending the several important workshop and study visit for knowledge enhancement and experience enrichment in fisheries management.
Sub-activity 4.2: Preparation and publishing of terminal report	Information of regional purse seine fisheries will be analyzed and synthesized. Stock structures of shared small pelagic fish targeted by purse seine fisheries in the region are identified. The findings will be published in the terminal report.

#### 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 4												
Sub-activity 4.1: Recommendation for fisheries Management												
Sub-activity 4.2: Preparation and publishing of terminal report												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

Project id: 201504003			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2015 - 2019
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Malaysia
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 235,578
<b>Project Partner:</b>	TD, Secretariat	<b>Budget for 2019:</b>	USD 35, 460
<b>Project Leader:</b>	Dr. Ahmad Ali	<b>Involved Country:</b>	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

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		22,870
	Sub-activity 1.3: Identification of shark and ray species by DNA bar- coding	18,900	10,000	13,500	27,400	10,590
Activity 2: Utilization of By- catch Sharks and Rays	Sub-activity 2.1: County visits	6,492		4,433	9,871	
	Sub-activity 2.2: Summarization and publication					2,000
	Sub-activity 2.3: Core Expert Meeting				28,126	
<b>Sub-Total Budget</b>		<b>43,792</b>	<b>35,909</b>	<b>36,268</b>	<b>75,817</b>	<b>35,460</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

**Sub-activity 1.1:** SEAFDEC/MFRDMD proposed to organize ‘Advanced On-Site Training on Chondrichthyans Taxonomy and Biology’ from 25-26 September 2018, at Vung Tau, in Viet Nam. The proposed venue is at South Research Sub-Institute for Marine Fisheries (SORESIMF) Vung Tau. This activity will be conducted in collaboration with the Directorate of Fisheries, Ministry of Agriculture and Rural Development of the Socialist Republic of Viet Nam. The main objectives of the training are to provide knowledge and experience for local researchers and enumerators who are responsible for collecting sharks, rays and skates data that will become the national experts in sharks and rays in the future, besides to report the outcome from the training conducted in September 2017.

Activities will be proposed during the training including lectures on taxonomy, biology (reproduction mode of sharks and rays), presentation of findings based on data and information collected during on-site training at Vung Tau in 2017, data management, and standard operation procedure (SOP) on data collection up to species level. Proposed practical at laboratory will be included identification of sharks and rays species caught by trawlers and other gears, SOP for collecting of tissue samples for DNA analysis, selecting of samples at landing site, and measurement technique of sharks and rays at landing sites. DNA tissues of sharks, rays and skates also will be collected for DNA bar-coding analysts.

**Sub-activity 1.2:** SEAFDEC/MFRDMD will organized a ‘Core Expert Meeting (CEM) on Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region’ from 9-10 October 2018, Kuala Lumpur, Malaysia. The Meeting aims at obtaining information on the outcome and output of the project from 2015-2018 conducted in this region in collaboration with Member Countries, SEAFDEC TD and SECRETARIAT. This meeting is part of the continuous efforts organized by SEAFDEC for sustainable utilization and effective management of sharks and rays in the Southeast Asian waters. This meeting has specific objectives: to obtain information on the current landing data collection of sharks, rays and skates up to species level in participating Member Countries; to compile information on the status of marketing, trade (including implementation of NDF for export of appendix II CITES) and fishers’ dependencies (socio economy) of sharks and rays resources in Member Countries; to update current status on the implementation of NPOA-Sharks in Member Countries; to present the results and progress of the JTF VI activities conducted by MFRDMD from 2015-2018 on ‘Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the

Southeast Asian Region’ and; to explain the new JTF VII project on Research to Enhance Chondrichthyans Resources and Management in the Southeast Asia Region for Sustainable Utilization from 2020 to 2024. Representative from all member countries except Lao PDR will be invited to present their country report on Data Collection/Management (NPOA-Sharks)/CITES listed species, Marketing, Trade (NDF) and Socio Economy Studies on Sharks and Rays. Resources persons on population dynamic, DNA and sharks age determination also will be invited.

Sub-activity 1.3: MFRDMD had analyzed 133 and 134 specimens for sharks and rays respectively. Out of this, 39 species of sharks, 32 species of rays and 2 species of skates were managed to get DNA sequences results and has been uploaded to BOLD database system (<http://boldsystems.org>). In 2018, a total of 7 species of sharks, 7 species of rays and 1 species of skates were genetically identified which were collected from Vung Tau, Viet Nam in 2017. Besides that, a total of 10 species of rays (20 samples) collected from varies locations from Malaysia and Cambodia. A dried sample of *Pristis pristis* collected from Mukah, Malaysia (CITES listed species) also was genetically identified.

Currently, 32 samples of sharks and 14 samples rays collected during sampling in Phuket in July 2018 were analyzed.

**Sub-activity 2.1:** A Survey on Fishers Dependencies, Marketing and Trade of Sharks and Rays in Java and Sumatera, Indonesia’ was conducted from 31 July to 15 August at Jakarta, Pelabuhan Ratu, Cilacap, Semarang, Surabaya (in Java), and Lampulo and Sibolga in Aceh (Sumatera). The survey was conducted in collaboration with researchers from Research Center for Fisheries Jakarta. The specific objectives are: to study the shark and rays marketing and trade in Java and Sumatera, Indonesia; to identify the major actors in the marketing and trade of sharks and rays at study areas; to study the sharks and rays marketing channels and practices in selected areas in Java and Sumatera; and to collect basic information on socio economy and trade data for preparation of NDFs for Indonesia.

Data on marketing channels at all study sites is now being analyzed by all researchers and the result will be presented during the ‘Core Expert Meeting (CEM) on Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region’ planned to be held from 9-10 October 2018, in Kuala Lumpur.

## 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: Identification of Sharks and Rays in the Southeast Asian Region					
Sub-activity 1.1: Advanced On-Site Training in the region (Viet Nam). Proposed to be implemented on 25 – 26 Oct. 2018.	Training	20 (Viet Nam)	3 MFRDMD	0	9,200
Sub-activity 1.3: Identification of shark and ray species by DNA bar-coding	Research	1 (Viet Nam) 2 (Malaysia) 1 (Thailand)	3 MFRDMD		21,964
Activity 2: Utilization of By-catch Sharks and Rays					
Sub-activity 2.1: County visit (A Survey on Fishers Dependencies, Marketing and Trade of Sharks and Rays in Java and Sumatera, Indonesia	Research	2 (Indonesia)	2 MFRDMD	0	11,721

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Sub-activity 2.3: Core Expert Meeting	Research	Brunei DS (1), Cambodia (2), Indonesia (2), Japan (1), Malaysia (3), Myanmar (2), Philippines (2), Singapore (1), Thailand (2) Viet Nam (2)	7 MFRDMD 1TD 1 Secretariat	*RPs (3)	25,480

\*RPs= Resource person

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements																
Activity 1	Yearly updated information on chondrichthyans biodiversity in the region	<p>Latest updated on the biodiversity of sharks, in SEAFDEC Member Countries was presented during '2nd Indonesia Shark and Ray Symposium', held from 28-29 March 2018 in Jakarta. The paper entitled 'Biodiversity and Habitat Preferences of Living Sharks in the Southeast Asian Region' was accepted to be published in Indonesian Fisheries Research Journal 2018. 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. The latest information on the number of shark species recorded in the region is as shown below.</p> <table border="1" data-bbox="949 1276 1264 1534"> <thead> <tr> <th>Countries</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Cambodia</td> <td>26</td> </tr> <tr> <td>Indonesia</td> <td>114</td> </tr> <tr> <td>Malaysia</td> <td>68</td> </tr> <tr> <td>Myanmar</td> <td>64</td> </tr> <tr> <td>Philippines</td> <td>96</td> </tr> <tr> <td>Thailand</td> <td>76</td> </tr> <tr> <td>Viet Nam</td> <td>70</td> </tr> </tbody> </table> <p>Manuscript entitled 'Identification guide to sharks, rays and skates of the Southeast Asian Region' (Volume 2) will be published by end of 2018</p>	Countries	Total	Cambodia	26	Indonesia	114	Malaysia	68	Myanmar	64	Philippines	96	Thailand	76	Viet Nam	70
Countries	Total																	
Cambodia	26																	
Indonesia	114																	
Malaysia	68																	
Myanmar	64																	
Philippines	96																	
Thailand	76																	
Viet Nam	70																	
Sub-activity 1.1: Advance On-site training in the region (Viet Nam). Proposed date 25-26 Sep. 2018)	<ol style="list-style-type: none"> <li>One training course with 10 researchers and enumerators from Vung Tau and Binh Thuan in 2018.</li> <li>Ten participants with advanced knowledge on the taxonomy and biology of the most common chondrichthyans species in Viet Nam.</li> <li>Increase the number of chondrichthyans specimens</li> </ol>	Not implement yet. All official documents on the application to organise the training was sent to Council Director of SEAFDEC for Viet Nam in May 2018.																

Planned activity	Expected outcome/output	Achievements
	collection at the South Research Sub-Institute for Marine Fisheries, Vung Tau, Viet Nam. 4. Increase DNA Barcoding data on chondrichthyans species in Viet Nam 5. Update checklist of chondrichthyans species in Viet Nam for 2018.	
Sub-activity 1.3: Identification of shark and ray species by DNA bar-coding	Genetic information for sharks and rays species identification in the region has been obtained/summarized by DNA bar-coding	In 2018, a total of 7 species of sharks, 9 species of rays and 3 species of skates were genetically identified from 11 out of 54 specimens (20%) sharks, 25 out of 68 specimens (37%) and 5 out of 22 specimens (23%) skates which were collected from Vung Tau, Viet Nam in 2017. Most of the samples were bacteria contaminated and some of the samples were unable to amplified by PCR analysis. However, method optimization (using different set of DNA primers but time and cost consuming) is needed to overcome this problem. Besides that, a total of 10 species of rays (20 samples) collected from varies locations from Malaysia and Cambodia. A dried sample of <i>Pristis pristis</i> collected from Mukah, Malaysia (CITES listed species) also was genetically identified. Currently, 32 samples of sharks and 14 samples rays collected during sampling in Phuket in July 2018 were analyzed.
Activity 2: Utilization of By-catch Sharks and Rays		
Sub-activity 2.1: County visits (Indonesia)	Improved fishery management on CITES listed sharks and rays species/socio economic and marketing information of sharks and rays in Java and Sumatera, Indonesia	Data is still being analyzed and the result will be presented during CEM in October at Kuala Lumpur.
Sub-activity 2.3: Core Expert Meeting. Proposed date: 9-10 Oct. 2018	1. Updated status of sharks and rays information collection in SEAFDEC Member Countries especially on biodiversity, taxonomic (including DNA-barcoding result) species composition in landing data, implementation of NPOA-Sharks, marketing, trade (NDF) and socio economy in the region 2. Plan activities for JTF VII project on 'Research to Enhance Chondrichthyans Resources and Management in the Southeast Asia Region for Sustainable Utilization' 3. Recommendations for improvement of sharks and rays projects in collaboration with Member Countries, SEAFDEC TD, SECRETARIAT and other agencies	Invitation letter was sent to all Council Director of SEAFDEC Member Countries and resource persons in August 2018.

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1. Ahmad, A., Fahmi, Dharmadi, Tassapon Krajangdara, Annie Lim Pek Khiok. 2018. Biodiversity and Habitat Preferences of Living Sharks in the Southeast Asian Region. Indonesia Fisheries Research Journal of (in Press)	Scientific paper	Yes
2. 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)	Power point	Yes
3. Ahmad, A., Lawrence, K. and Yusri, Y. 2018. Case study: NDFs for <i>Sphyrna lewini</i> 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	Power point	Yes
4. Noorul-Azliana J., Wahidah M.A., Ahmad, A., Lee Hu T.A., Adam L.P. & Annie-Nunis B. 2018. Study on DNA Barcoding of sharks from Malaysia and Viet Nam (Draft).	Scientific paper	Yes
5. Noorul-Azliana J 2018. DNA Barcoding result of sharks collected in the Southeast Asian Region.	Technical report	To be presented during CEM in October 2018.
6. Wahidah M.A. 2018. DNA Barcoding result of rays and skates in the Southeast Asian Region.	Technical report	To be presented during CEM in October 2018.

#### 5. Evaluation from Participants of Member Countries

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1: Advanced On-site training in the region (Viet Nam)	Not implement yet
Sub-activity 1.3: Identification of shark and ray species by DNA bar-coding	Participating country will comment during CEM in October 2018.
Activity 2	
Sub-activity 2.1: County visits (Indonesia)	Since the result is still analyst, evaluation from participating country did not received yet. Indonesia will comment during CEM in October
Sub-activity 2.3: Core Expert Meeting	Not implement yet

#### 6. Major Impacts/Issues

##### Sub-Activity 1.1

Not implement yet

##### Sub-Activity 1.3

Issue 1: Specimens identified up to genus level only.

Collected specimens were identified only up to genus level during sampling activity by taxonomist and genbank data was not available (due to no reported data on that particular genus and species) can gave difficulties to number of samples to be uploaded to the BOLD database. This issue could give major impact to identification of look-alike species. Most probably those sample taken from undescribed species.

Plan to tackle this issue: Taxonomy identification must be up to species level during specimen identification so that the species confirmation can be 100% significant before can be uploaded to the database system. However, in some case this will be impossible for undescribed species.

Issue 2: No reference in genbank database or different identification by previous report

Some of the samples were newly identified (*e.g. Neotrygon orientalis, Neotrygon varidens, Narcine lingual, Platyrrhina tangi etc.*) and no reference can be referred. It is also difficult to upload the corrected species due to wrong identified by previous genbank submitter (*e.g. C. sarawakensis* was reported by *C. umbratile*) and this can make difficult to upload the correct data to the genbank.

Plan to tackle this issue: More samples need to be collected with correct morphology and meristic count before can be reported to the genbank administration on this issue.

Issue 3: Specimen contamination.

The samples of the collected from Viet Nam in 2017 shows bacteria contaminated.

Plan to tackle this issue: The specimen collection must follow the SOPs provided and the collectors must make sure the sampling field is clean to avoid any of the specimen contamination during sampling.

Issue 4: Failure in PCR amplification

The samples of the collected from Viet Nam in 2017 gave more than 50% of PCR failed (due to degraded DNA) to amplify and the further analysis can't be proceeded.

Plan to tackle this issue: Method optimization (using different set of DNA primers or design new primer but time- and cost- consuming) is needed to overcome this problem. The current primer is a universal primer for fish and may not be suitable for certain species such as shark and ray.

#### **Sub-activity 2.1:**

In general marketing studies at Jakarta, Pelabuhan Ratu, Cilacap, Semarang and Suranaya (in Java), and Lampulo and Sibolga (in Sumatera) was conducted as in schedule. In general, all information collected from local middleman, collectors, distributors and traders showed that almost all parts of sharks and rays were fully utilised for human consumption and inedible parts such as stomach and other organs were sold to fishmeal factories or aquaculturist to process as food for catfish. Most product such as sharks and rays meat are salted and sun dried. Sharks and rays resources are consider as very important source of food for low income people in Indonesia especially those living far from fishing port. Fins and cartilage are mostly for export market.

Due to limited budget and limited schedule researchers only manage to complete two out of four objectives of proposal; survey on the major actors in domestic marketing of sharks and rays especially CITES listed species and survey on the sharks and rays trade channels and practices. The main reason we cannot conduct the socio-economic survey during this trip was the location of fishing villages are very far from collector and trader offices. In some cases, collectors and traders at Semarang and Surabaya got their supply from fishers living in other Islands such as in Jogjakarta in Sulawesi, Bali, Beruan Island and Kalimantan. We propose to conduct socio-economic survey on the dependencies of fishers at several important landing sites and survey the impacts on socio-culture-economy of fishers after several sharks and rays species listed in Appendix II CITES at selected landing sites socio- economic study in 2019.

#### **Sub-activity 2.3:**

Core Expert Meeting

Not implement yet

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
Sub-activity 1.2 Workshops on identification of sharks and rays in the region	A 5-days Workshops on identification of sharks and rays in the region proposed to be held in April 2019.	22,870
Sub-activity 1.3: Identification of shark and ray species by DNA bar-coding	Biological information, catch data and tissue sample from sharks and rays will be collected at selected landing sites in participating Member Countries. Sample will be analyzed at MFRDMD DNA laboratory for bar-coding. The results will be presented during the Workshop.	10,590
Activity 2		
Sub-activity 2.2: Summarization and publication	i. Publication of Proceeding CEM in January 2019: 1000 ii. Publication a report on A Survey on Fishers Dependencies, Marketing and Trade of Sharks and Rays in Java and Sumatera, Indonesia: 1,000	2,000

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity	
	Outcomes	Output
<b>Activity 1</b>		
Sub activity 1.2: Workshops on identification of sharks and rays in the region	MFRDMD strengthens expertise on identification to species and biological data collection on sharks and rays in the region.	16 new young taxonomists on sharks and rays were trained and able to identify at least all common species in their countries
Sub-activity 1.3 Identification of shark and ray species by DNA bar-coding	Information on DNA- bar-coding for sharks and rays in the region updated yearly	Additional bar-coding analyses for sharks and rays in the region
<b>Activity 2</b>		
Sub-activity 2.2	Information on sharks and rays biodiversity, marketing, data collection, utilization compiled for future references	Three new publication on sharks and rays in the region

#### 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activity 1.2 Workshop on identification of sharks and rays and data collection in the region												
Sub-activity 1.3 Identification of shark and ray species by DNA bar-coding												
Activity 2												
Sub-activity 2.2: Summarization and publication.												

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
Publication of Proceeding CEM in January 2019												
Publication a report on A Survey on Fishers Dependencies, Marketing and Trade of Sharks and Rays in Java and Sumatera, Indonesia:												
Reprinting Field guide of sharks, rays and skates in the SEA region (Volume 2)												



**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

Project id: 201706005			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2017(August)-2019(July)
<b>Lead Department:</b>	SEAFDEC secretariat	<b>Lead Country:</b>	Indonesia
<b>Donor/Sponsor:</b>	JAIF (Japan-ASEAN Integration Fund)	<b>Total Donor Budget:</b>	USD 842,852.80
<b>Project Partner:</b>	ASEAN-SEAFDEC Member Countries	<b>Budget for 2019 (2018(August)-2019(July)):</b>	USD392,771.40
<b>Project Leader:</b>	Mr. Isao Koya	<b>Involved Country:</b>	All SEAFDEC 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,	Indicator 1: Main factors that drop the survival rate of juvenile eels are identified and consolidated, Indicator 2:

Objective	Outputs	Activities	Indicator
		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.	Improved technologies for higher survival of eel juveniles are 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. <ul style="list-style-type: none"> <li>- To identify major fishing grounds of juvenile anguillid eels (glass eel and elver).</li> <li>- To investigate whether any catch statistics on juvenile anguillid eels exist on major fishing grounds.</li> <li>- To grasp the commodity chains of juvenile anguillid eels as seeds for eel farming.</li> <li>- To find out the appropriate points for surveying/checking the quantity of daily/weekly/monthly catch of juvenile anguillid eels at each stage with fishing effort indices from the commodity chains of juvenile anguillid eels then collect the</li> </ul>

Activity	Description
	<p>independent data besides of the official catch statistics.</p> <ul style="list-style-type: none"> <li>- To examine the accuracy/precision of the existing catch statistics and the appropriateness of the contents/items of the data/information on catch of juvenile anguillid eel and corresponding fishing effort indices, with consideration on the need for additional data for cross-checking and monitoring the trend of both catch and efforts (to estimate the long-term chronological trend of Catch per Unit Effort (CPUE)).</li> <li>- To analyze time series of the catch statistics of juvenile anguillid</li> <li>- To analyze catch trends of juvenile anguillid eels and CPUE at each major fishing ground using catch statistics and data on fishing efforts in order to evaluate the present condition and trend of anguillid eel resources at each fishing ground and species.</li> </ul> <p>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.</p> <p>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.</p>
<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.</p> <ul style="list-style-type: none"> <li>- To identify major fishing grounds of immature/matured anguillid eels (yellow eel and silver eel) where seeds for culture are collected and catch are landed for consumption.</li> <li>- To investigate whether catch statistics on yellow/silver eels exist in major fishing grounds.</li> <li>- To understand the commodity chains of yellow/silver eels.</li> <li>- To find out the appropriate points for surveying/ checking the quantity of daily/weekly/monthly catch of yellow/silver eel at each stage with the fishing effort indices from the commodity chains of yellow/silver eels, then collect the independent data besides of the official catch statistics.</li> <li>- To clarify the accuracy/precision of existing catch statistics and the appropriateness of the contents/items of the data/information on yellow/silver eel catch and corresponding fishing effort indices, with consideration on the need for additional data for cross-checking and monitoring the trend of both catch and efforts (to estimate the long-term chronological trend of CPUE). This is to confirm whether other species such as rice-paddy eels contaminates the catch statistics of anguillid eels.</li> <li>- To analyze the time series of the catch statistics of yellow and silver eels with appropriate fishing effort indices by major fishing grounds.</li> <li>- To analyze the trend of yellow and silver eel catch and CPUE at each major fishing ground using catch statistics and data on fishing efforts in order to evaluate the present condition and trend of anguillid eel resources.</li> </ul> <p>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</p>

Activity	Description
	<p>of starting) anguillid eel fishery.</p> <p>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.</p> <ul style="list-style-type: none"> <li>- To analyze the published papers and proceedings regarding the species identification of tropical anguillid eels by DNA technology methods, and detect the causes and background why the studies of species identification of juvenile anguillid eels in Southeast Asian region using DNA technology remains unclear as scientists in the region could not yet reach into a conclusion.</li> <li>- To consider the appropriate measures/methods in getting agreeable results among the scientists handling tropical anguillid eels, and to develop the survey design of gathering juvenile anguillid eels (glass eel and elver) from the major fishing grounds for collecting eel seeds among the ASEAN member states, with the careful consideration of any limitations/laws to regulate the handling of specimen and acceptance of foreign scientists at each AMS.</li> <li>- To check the accuracy and precision of eel production statistics from eel farming by examining coverage of data collection and the possibility of handling anguillid eel at species level, and checking for the possibility of contamination of catch statistics by other species like rice-paddy eel.</li> </ul> <p>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.</p> <ul style="list-style-type: none"> <li>- To investigate whether statistics of eel farming production have been existed or not at each country.</li> </ul>
<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</p> <p>1.4.2: To collect juvenile anguillid eels for analyses using DNA technology.</p> <ul style="list-style-type: none"> <li>- To collect juvenile anguillid eels from the major fishing grounds as a specimen for analyses using DNA technology with the support from DoFs of AMS and SEAFDEC.</li> <li>- To analyze the specimen using DNA technology, then summarize the results into the (monthly/seasonal/annual) trends of species composition at each sampling site.</li> </ul> <p>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 Sub-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 possible causes/reasons that might affect the</p>	

Activity	Description
survival of juvenile anguillid eels.	
Sub-activity 2.2: To identify critical factors those contribute to high mortality rates of eel juveniles (glass eels) in captive rearing conditions (eel farm).	
Sub-activity 2.3: To develop strategies (or protocols) for improved survival of eel juveniles under captive rearing conditions.	
Sub-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.	
Activity 3 Sub-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.	
Sub-activity 3.2: To conduct three different meetings	<p>To conduct three different meetings, which include:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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</li> <li>iii. Two Assessment Committee meetings held in Bangkok, Thailand to confirm and evaluate the progress of the project activities.</li> </ul>

### 3.3 Activity, Sub-activity and Proposed Budget for 2017-2019

(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 2018 PROJECT IMPLEMENTATION

### 1. Achievements of the Project Implementation for the Present Year (August 2017-July2018)

The implementation period of this project is two years from August 2017 to July 2019. The implementation status and results of the project from August 2017 to July 2018 are as follows.

#### 1. Activity 1 (Statistical survey)

##### - 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 were collected. (regular survey).

DNA data of Anguillid eel was analyzed to identify the habitat by species.

#### 2. Activity 2 (Survival rate survey)

The survival rate survey has been started by cultivating the glass eel caught on Luzon Island in Philippines. This year, 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

#### 3. Activity 3

- Project planning meeting was held in 4<sup>th</sup> August as the start of the project.

In the meeting, persons in charge of each AMSs on the project were selected and the project working plan was approved. Present status of utilization Anguillid eel in six Countries (Cambodia, Indonesia, Myanmar, Philippines, Thailand and Viet Nam) was presented.

- The First Assessment Committee Meeting was held in 19<sup>th</sup> December.

In the meeting, the external committee evaluated/reviewed the result/method of statistical and survival rate survey activities of the project.

- The First Regional Meeting was held on 25<sup>th</sup> January

In the meeting, the statistics data obtained from the baseline survey, the regular survey and survival rate survey were analyzed and the utilization situation of the Anguillid eel resources in each country was compiled.

- The International Technical Workshop was held on 6-7<sup>th</sup> June

In the meeting, the information document “Status and resources management of tropical anguillid eels in Southeast Asia” for submitting to CITES animal committee was created.

The result of statistical data was analyzed and compiled.

### 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	III	79	17	166	246,241.91
Activity 2	III	10	5	3	10,151.92
Activity 3	IV	70	99	28	100,856.32

### 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.	Implementation of data collection statistical survey on catch and aquaculture production of Anguillid eel in ASEAN six countries where eel fishery is existing
Activity 2	Tropical Anguillid eel aquaculture technologies are improved in AMS.	Survey on the survival rate of glass eel in aquaculture will be carried out and analyzed.
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.

### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
Status and Resources Management of Tropical Anguillid Eels in Southeast Asia	Electronic data(On website of CTIES home page)	<a href="https://cites.org/sites/default/files/eng/com/ac/30/Inf/E-AC30-Inf-11.pdf">https://cites.org/sites/default/files/eng/com/ac/30/Inf/E-AC30-Inf-11.pdf</a>

### 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 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 particular, it is difficult to obtain information on catch of glass eel in the Philippines and information on eel aquaculture in Viet Nam. In these countries, it is necessary to go frequently to field surveys and collect information.

2. In order to grasp the resource situation, ecological information such as the season when the silver eel downstream the river and the glass eel upstream the river is necessary. However, it is difficult to collect such data. Therefore, questioner for eel consolidators should include questions on ecological information.



### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1	<ul style="list-style-type: none"> <li>- Implementation of statistical survey to grasp utilization status of Anguillid eel resources in AMSs.</li> <li>- Implementation of DNA analysis to clarify the species identification, habitat and species composition of Anguillid eel.</li> </ul>	117,206
Activity 2	<ul style="list-style-type: none"> <li>- Implement survival rate survey to find improved method of survival rate of cultivating glass eel.</li> </ul>	56,934
Activity 3	<ul style="list-style-type: none"> <li>- To hold "Regional Meeting" where ASEAN countries and international organizations participate.</li> <li>- To hold "Resources management workshop" to examine resource management measure of Anguillid eel in AMSs.</li> <li>- To hold "Statistics workshop" to examine collecting statistical data of Anguillid eel in AMSs.</li> </ul>	156,609

\* Cost sharing scheme

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	<ul style="list-style-type: none"> <li>- The status of utilization (catch, aquaculture) of Anguillid eel resources in the ASEAN region is grasped by statistical survey.</li> <li>- Species of Anguillid eel are identified and species composition is grasped by DNA analysis.</li> </ul>
Activity 2	<ul style="list-style-type: none"> <li>- Main factors that drop the survival rate of juvenile eels are identified and consolidated</li> <li>- Improved technologies for higher survival of eel juveniles are identified</li> </ul>
Activity 3	<ul style="list-style-type: none"> <li>- Knowledge on tropical anguillid eel resource management is enhanced among AMSs.</li> <li>- Anguillid eel resource management policy of each country for sustainable use of resources will be examined and formulated.</li> </ul>

#### 3. Schedule of Activity for the Year 2019 (August 2018 – July 2019)

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

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201706004
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	SEAFDEC-EU/CITES Sharks Project Phase II		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2018 - 2019
<b>Lead Department:</b>	Secretariat	<b>Lead Country:</b>	None
<b>Donor/Sponsor:</b>	EU through CITES Secretariat	<b>Total Donor Budget:</b>	USD 90,000
<b>Project Partner:</b>		<b>Budget for 2019:</b>	USD
<b>Project Leader:</b>	Dr. Worawit Wanchana	<b>Involved Country:</b>	Cambodia, Indonesia, Malaysia, Myanmar, Viet Nam, Thailand

## **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 sharks conservation/management in Southeast Asia.

In 2015, SEAFDEC carried out a one-year regional project on sharks and rays data collection in relevant countries of the ASEAN. The project consisted of:

- Compiling information on sharks data collection
- National workshops and training sessions on sharks identification for enumerators
- Recording of landing data at species level
- Validation of data, mid-term evaluation
- Final review of national and regional reports

Based on the EU-CITES project *Implementation of Decision* adopted by the 17<sup>th</sup> meeting of the Conference of the Parties to CITES (COP-17) through the work of the CITES Secretariat, funded under the GPGC Strategic Cooperation Agreement between UNEP and the European Commission, the CITES Secretariat agrees to co-operate with SEAFDEC with respect to supporting the implementation of CITES provisions for sharks and rays through target support for data collection and training in the making of Non-Detrimental Findings (NDF), pursuant to Decision 17.212.

### **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 on the experience and feedback from this very successful cooperation, the new project will continue to support ASEAN Member States in fulfilling CITES provisions for trade in Appendix-II listed sharks and rays. 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, Outcomes and Outputs 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 for further improvement of the national statistics towards data availability for assessment of stock status of CITES listed shark/ ray 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 data collection at landing sites in the information-poor Parties (Cambodia, Myanmar, and Viet Nam)
Objective 2 Develop regional reference for supporting development of shark NDFs	Outcome 2 Regional references for development of national NDFs	Output 2 Report of the national workshop to support development of national NDFs for 3 Parties	Activity 2 National workshops to support development of national NDFs 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)	Outcome 3.1 Exchange information with other ASEAN 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 Report of project-end-meeting	Activity 3.1 Participation of project staff to CITES CoP 18  Activity 3.2 Organization of project-end-meeting

### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1.1 National workshops for training of local enumerators for 4 information-poor Parties	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 1.2 One-year data collection at landing sites in the information-poor Parties (Cambodia, Myanmar, and Viet Nam)	This activity supports the information-poor Parties (Cambodia, Myanmar, and Viet Nam) 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.
Activity 2 National workshops to support development of national NDFs 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 further shared with other AMSs.
Activity 3.1 Participation of project staff to CITES CoP 18 Activity 3.2 Organization of project-end-meeting	Results from data collection and experiences on development of shark NDF in Southeast Asian region can be shared at international fora and regional events.

### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2019

		(USD)	
Activity	Sub-Activity	2018	2019
Activity1	Activity1.1	20,000	8,000
	Activity1.2	9,000	9,000
Activity2			20,000
Activity3	Activity3.1		10,000
	Activity3.2		14,000
<b>Sub-Total Budget</b>		<b>29,000</b>	<b>61,000</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

The key achievements of the project implementation for the year 2018 are as follows:

#### 1) National workshop for training of local enumerators

Approximately 30 enumerators of information-poor Parties (Cambodia, Myanmar, and Viet Nam) were trained and enhanced their knowledge on elasmobranch taxonomy to be ready for starting a new one-year shark data collection in their respective landing sites.

#### 2) One-year data collection on shark/ray landing

Subsequently to organization of the workshops in the three (3) countries as mentioned above, the one-year shark data collected has been started.

## 2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity*	Number of Participants and Audients			Spent Budget (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1</b>					
1.1 National workshops for training of local Enumerators for information poor Parties (Cambodia, Myanmar, Philippines, and Viet Nam)	Training	30			20,000
1.2 One-year data collection at landing sites in the information-poor Parties (Cambodia, Myanmar, and Viet Nam)	Research	6			9,000
				<b>Sub-total</b>	<b>29,000</b>
<b>Activity 2</b>					
National workshops to support development of national NDFs for 3 Parties	Research				
				<b>Sub-total</b>	<b>0</b>
<b>Activity 3</b>					
3.1 Participation of project staff to CITES CoP 18	Policy				
3.2 Organization of project-end-meeting	Policy				
				<b>Sub-total</b>	<b>0</b>

## 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
<b>Activity 1</b>		
1.1 National workshops for training of local Enumerators for information poor Parties (Cambodia, Myanmar, Philippines, and Viet Nam)	Local enumerators in the information-poor Parties are well trained on species identification of sharks.	<ul style="list-style-type: none"> <li>- Agreed landing sites with the participating countries</li> <li>- Plan of activities for one-year data collection on shark landing in the selected landing sites</li> </ul>
1.2 One-year data collection at landing sites in the information-poor Parties (Cambodia, Myanmar, and Viet Nam)	A set of one-year data collection in the participating countries that the results can be used as a basis for further development of national shark NDFs, and conservation/management plan for shark.	<ul style="list-style-type: none"> <li>- One-year data collection in the 3 countries</li> </ul>
<b>Activity 2</b>		
Organization of national workshops in 3 countries, namely Malaysia, Indonesia, and Thailand	Develop formal document of shark NDFs that can be used as national/regional reference to other countries in the region.	<ul style="list-style-type: none"> <li>- A set of national shark NDFs in the participating countries (at least one successful case)</li> </ul>
<b>Activity 3</b>		
3.1 Participation of project staff to CITES CoP18	- Exchange and sharing of information from Southeast Asian region based on one-year data collection on shark landing and other relevance information.	
3.2 Organization of project-end-meeting	- To finalize the outputs from project activities	

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1) Report of the national workshop for training of local enumerator (Cambodia, Myanmar, and Viet Nam)	Paper (PDF)	

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

Planned activity	Evaluation /Views from Participants
Activity 1	
Activity 2	
Activity 3	

#### 6. Major Impacts/Issues

Capacities, skills, and knowledge of local and national enumerators/data collectors were enhanced throughout the series of activities on national workshop for training of local enumerators and national workshop on development of shark NDFs.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

		(USD)
Proposed Activity	Description of Proposed Activity	Proposed Budget
1.1 National workshop for training of information-poor Parties	Similar national workshop for training of local enumerators conducted in 2018 will be organized for the Philippines.	8,000
1.2 One-year data collection at landing sites	As already started in 2018, the project will continue to support the participating countries to collect shark landing at the agreed landing sites.	18,000
2. National workshops to support development of national NDFs	The national workshops will be organized in 3 countries, including Malaysia, Indonesia, and Thailand.	20,000
3.1 Participation of project staff to CITES CoP18	One or two project staff will attend the CITES CoP18 in Sri Lanka in May 2019 to disseminate preliminary results of the regional initiatives on shark data collection at species level.	10,000
3.2 Organization of project-end-meeting	The project-end-meeting will be organized to finalize and regionalize the results from one-year shark data collection during 2018 to 2019	14,000

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
1.1 National workshops for training of information-poor Parties	1) Capacity building on shark species identification in the target countries (Philippines for 2019; Cambodia, Myanmar and Viet Nam for 2018)
1.2 One-year data collection at landing sites	2) Good quality of one-year shark data collection in the participating countries, namely Cambodia, Myanmar, and Viet Nam. 3) Complete data set of one-year data collection supporting by the project.
Activity 2	
National workshops to support development of national NDFs	A set of regional references in development shark NDFs
Activity 3	
3.1 Participation of project staff	1) Information package to be disseminated at the relevant regional and

Proposed Activity	Expected Outcomes/Outputs of Activity
to CITES CoP118 3.2 Organization of project-end-meeting	international fora 2) A set of report for SEAFDEC/EU-CITES Shark Project Phase II

### 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activity 1.1												
Sub-activity 1.2												
Activity 2												
Activity 3												
Sub-activity 3.1												
Sub-activity 3.2												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

	Project id: 201801011		
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Strengthening the Effective Management of Inland Fisheries and Aquaculture in AMS with GIS and RS technology		
<b>Strategy:</b>	I	<b>Total Duration:</b>	2019
<b>Lead Department:</b>	SEAFDEC Secretariat	<b>Lead Country:</b>	None
<b>Donor/Sponsor:</b>	JAIF (Japan-ASEAN Integration Fund)	<b>Total Donor Budget:</b>	USD 279,959.9
<b>Project Partner:</b>	ASEAN-SEAFDEC Member Countries	<b>Budget for 2019:</b>	USD 279,959.9
<b>Project Leader:</b>	Dr. Worawit Wanchana	<b>Involved Country:</b>	All SEAFDEC Member Countries

## **PART I: OVERALL PROJECT DESCRIPTION**

### **1. Brief Project Description**

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 is 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.

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

### 3.1 Objectives, Outcome and Output of the Project

Objective	Outputs	Activities	Indicator
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: 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	Indicator 1.1: To clarify the relationship between graphical/environmental data by remote sensing and catch data on the fishing ground by GIS Mapping and multivariate analysis.  Indicator 1.2: The monitoring method for inland fisheries resources management by GIS Mapping /RS technology is proposed and guideline of analytical method is created.

Objective	Outputs	Activities	Indicator
		<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> <p>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</p>	
	<p>Output 2: Dissemination of the monitoring and analyzing GIS Mapping /RS technical methods on geographical / environmental data and catch amount data in AMS.</p>	<p>Activity 2 Technical analysis method of GIS Mapping / RS to clarify the relationship between geographical/environmental data and catch data is disseminated to AMSs.</p> <p>2.1: To summarize the result of catch monitoring method using GIS Mapping/RS technology obtained through activity 1.</p> <p>2.2: To create technical manual on analysis methods using GIS Mapping technology.</p> <p>2.3: To hold the workshop on catch analysis using GIS Mapping /RS technology for disseminating technology to AMSs.</p>	<p>Indicator 2.1: A technical manual on analysis methods using GIS Mapping technology is produced.</p> <p>Indicator 2.2: The number of staffs who can analyze using GIS Mapping / RS technology increases in AMSs countries</p>

### 3.2 Overall Scope/Description of Project

Activity	Description
<p>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</p>	<p>1.1.1: 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.</p> <p>1.1.2: 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 by SEAFDEC. A certain method will be applied to remove the wrong data.</p>
<p>Activity 1.2: Environmental data on the geographical</p>	<p>1.2.1: To analyze which satellite sources can provide the suitable and reliable geographical/environmental data on the target fisheries</p>

Activity	Description
and inland water aquatic organisms habitats based on satellite images for each target site of AMS are collected and compiled	<p>areas, 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.</p> <p>1.2.2: 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 sites of each country</p>
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.	<p>1.3.1: To analyze all the collected data in target sites of each country by various GIS Mapping technologies and data sources are shared among AMSs.</p> <p>1.3.2: To consider the suitable catch monitoring method with multivariate analysis using GIS Mapping technology, focus on the important monitoring index and provide possible measures for improving fisheries production</p>
Activity 2: Technical analysis method of GIS Mapping / RS to clarify the relationship between geographical/environmental data and catch data is disseminated to AMSs.	<p>2.1: To summarize the result of catch monitoring method using GIS Mapping/RS technology obtained through activity 1.</p> <p>2.2: To create technical manual on analysis methods using GIS Mapping technology.</p> <p>2.3: To hold the workshop on catch analysis using GIS Mapping /RS technology for disseminating technology to AMSs.</p>

### 3.3 Activity, Sub-activity and Proposed Budget for 2017 (August)-2019 (July)

(Unit: USD)

Activity	Y1 2019
Activity 1:	181,184.00
Activity 2:	64,925.00
Common expense	8,400.00
Contingency	25,450.90

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

Since this project will start in 2019, there is no project performance in 2018.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2019

### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1	<ul style="list-style-type: none"> <li>- Data of catch amount by fishing ground necessary for GIS Mapping analysis at project sites are collected and compiled</li> <li>- Environmental data on the geographical based on satellite are collected and compiled</li> <li>- The relation among geographical/environmental data based on satellites and the catch data are analyzed and clarified with multivariate analysis</li> </ul>	181,184
Activity 2	<ul style="list-style-type: none"> <li>- To summarize the result of catch monitoring method using GIS Mapping/RS technology</li> <li>- To create technical manual on analysis methods using GIS Mapping technology</li> </ul>	64,925

Proposed Activity	Description of Proposed Activity	Proposed Budget
	- To hold the workshop on GIS Mapping analysis technology for disseminating to AMSs.	

**2. Expected Outcomes/Outputs of Activity for the Year 2019**

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 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 2	- Dissemination of the monitoring and analyzing GIS Mapping /RS technical methods on geographical / environmental data and catch amount data in AMS.

**3. Schedule of Activity for the Year 2019**

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Activity 2												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201503002
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Environment-friendly, sustainable Utilization and Management of fisheries and Aquaculture Resources		
<b>Strategy:</b>	II	<b>Total Duration:</b>	2015 - 2019
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 498,680
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 64,540
<b>Project Leader:</b>	Koh-ichiro Mori, AQD DC	<b>Involved Country:</b>	SEAFDEC Member Countries

**PART I: OVERALL PROJECT DESCRIPTION**

**1. Brief Project Description**

This Project titled “Environment-friendly, sustainable utilization and management of fisheries and aquaculture resources” is being 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; and 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, 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.

**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, 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 Centre (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.

Regional guidelines for responsible fisheries in Southeast Asia have pointed out the significance of promotion of research on the ecological and socioeconomic impact of aquaculture (SEAFDEC/AQD, 2005). Since aquatic resources and their environment exist beyond jurisdictions of local and national governments, regional approaches are inevitable for tackling the issues collaboratively among governments and states, locally or internationally.

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

#### 3.1 Objectives, Outcome and Output of the Project

Objective	Outcome	Output	Activity
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	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	Activity 1: Establishment of environment-friendly, responsible aquaculture technology - 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	Outcome	Output	Activity
	management strategy	in ASEAN Member States.	
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"> <li>- Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> 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.</li> <li>- Production of seeds in small-scale solar-powered hatchery.</li> <li>- 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.</li> </ul>
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"> <li>- Extension and demonstration for the breeding, hatchery seed production, nutrition and health management in grouper, seabass, snapper etc. through training program.</li> <li>- Special training focusing on the culture of important fisheries commodities such as giant freshwater prawn, cat fish, big head carp.</li> </ul>

### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Establishment of environment-friendly, responsible aquaculture technology	<p><u>Sub-activity 1.1:</u> Use of plant-based protein sources in tilapia feeds for improved production traits 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><u>Sub-activity 1.2:</u> Responsible aquaculture through aquasilviculture 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</p>

Activity	Description
	(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
Activity 2: Promotion of community-based production and resource enhancement of high-value aquatic resources	<p><u>Sub-activity 2.1:</u> 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> <p><u>Sub-activity 2.2:</u> 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 project aims to develop 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 community-based seahorse hatchery in the pilot site.</p>
Activity 3: Technology extension and demonstration	<p><u>Sub-activity 3.1:</u> 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 <i>etc.</i></p> <p><u>Sub-activity 3.2:</u> 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>
Activity 4: Publication	Manuals, posters, pamphlets and flyers describing disease prevention methods will be published and distributed.
Activity 5: Annual progress meeting and international workshop	<p><u>Sub-activity 7.1:</u> Annual progress meeting</p> <p>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>



Activity	Description
	<u>Sub-activity 7.2:</u> 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.
Activity 6: Coordination by Project Leader	The project leader coordinates and encourages the research, training and dissemination, and also facilitate information exchange not only between activities but also among Member Countries.

### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 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
	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
<b>Sub-Total Budget</b>		<b>79,000</b>	<b>65,400</b>	<b>66,000</b>	<b>142,480</b>	<b>64,540</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

Activity 1-1) The effect of feeding tilapia diets with agricultural wastes and by-products (ABPs) on growth and reproductive performance of Nile tilapia determined, Activity 1-2) Determined the time required to remove ammonia and phosphate from shrimp pond effluent; mangroves remove the nutrients through assimilation, Activity 2-1) Improved organizational tasks and skills towards market-oriented community-based resources enhancement (CBRE) and released juveniles in replicate sites, 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, and Activity 3) Technology and information transfer on resource enhancement practice through training.

### 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					
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	10	120	USD 29,000
Sub-activity 2.2: Promotion of resource enhancement of seahorses					
Activity 3: Technology extension and demonstration					
Sub-activity 3.1: Marine fish hatchery training program	II: Training	4		12	8894.75 as of Aug. 2018
Sub-activity 3.2: Rural aquaculture program	II: Training to be (conducted Nov. 20-04 Dec. 2018)	Not applicable at the moment.		Not applicable at the moment.	

### 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-	Feeding trials were conducted to evaluate the suitability of agricultural wastes and by-products (ABPs) in diets for tilapia broodstock and fingerlings. Replacement of fishmeal with 50% mango peel silage diet increased fry production but resulted in slightly reduced growth of

Planned activity	Expected outcome/output	Achievements
	products as feed ingredients	tilapia breeders over the 51-week period in tank- and lake-based cages. Okara meal as fishmeal replacer at 30% inclusion level enhanced growth and feed utilization in tilapia fingerlings. Citrus by-products (citrus peel and citrus pulp) as feed additives should be supplemented at 1% of diet to achieve best growth performance in Nile tilapia fingerlings. Dietary inclusion of fermented okara meal (FOM) up to 15% had no adverse effects on growth and feed efficiency, and effective at maintaining acceptable sensory attributes such as texture and flavor on fish flesh.
Sub-activity 1.2: Responsible aquaculture through aquasilviculture	To determine the time required for a mangrove habitat to remove nutrients (i.e. N, P) from shrimp farm effluents.	<p>1. The time required to remove nutrients from vegetated and non-vegetated environments were determined. At MPR=4, ammonia is removed from the water after 3 days; TSS, 2 days; phosphate and chlorophyll, 7 days. At MPR=2, only ammonia can be efficiently removed and after 3 days. Levels in MPR=0 remained high until after 14 days.</p> <p>2. Mangroves purify the water by nutrient uptake as indicated by the greater increase in stem length in saplings and trees in area receiving compared to habitat not receiving shrimp farm effluents.</p>
<b>Activity 2: Promotion of community-based production and resource enhancement of high-value aquatic resources</b>		
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	Improving fisheries governance and strategies for managing enhanced abalone and sandfish stocks and health of its habitat.	The highlights of accomplishments in 2018 include: 1) abalone hatchery constructed in Molocaboc Island in Sagay but needs structural reinforcement to support weight load; 2) releases and monthly monitoring of abalone and sandfish in Dacu and replicate in Diut continued; 3) abalone freeze-drying trials to explore marketing options to sustain Community-Based Resource Enhancement (CBRE) success; 4) demo-scale abalone hatchery for fisherfolk training; and 5) communicate with Partido State University for a CBRE replicate in Camarines Sur.
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.	Due to uncertain availability of juvenile seahorses from the hatchery, trials were conducted on the establishment of nursery rearing of seahorses in Molocaboc Island using available food from the sampling site. Many challenges were encountered but mitigated by installation of additional solar power system and training of fishermen organization members on the nursery rearing of newborn seahorses. Trials on the acclimation of juvenile seahorses are currently conducted in hanging net cages prior to release in the pilot site. Information education communication (IEC) activities will be conducted to promote resource conservation and protection of seahorses by giving lectures to school children, giving out posters and interviews with the local community.
<b>Activity 3: Technology extension and demonstration</b>		
Sub-activity 3.1: Marine fish hatchery training program	To train participants to operate a fish hatchery by providing them with technical knowledge and skills on spawning and larval	<p>The International Training Course on Marine Fish Hatchery was conducted at Tigbauan Main Station from June 19 – July 25, 2018.</p> <p>There were 16 participants. Four (4) participants (1 from Myanmar and 1 from Indonesia; 1 from BFAR 7 and 1 from ISCOF, Barotac Nuevo Campus) awarded GOJ-TF</p>

Planned activity	Expected outcome/output	Achievements
	rearing of marine fishes.	Training Fellowship Grants. Course officer submitted 2018 semi-annual report.
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.	A 10-day training course on "Community-Based Freshwater Aquaculture (CBFWA) for Remote Areas of Southeast Asia" will be conducted from November 20-Dec. 4, 2018 in Binangonan Freshwater Station, Binangonan, Rizal.  Letters of invitation for prospective participants from SEAFDEC Member Countries were already sent out to their respective Country and National Coordinators as early as Jan. 2018. Received 3 nominations from Member Countries (1 Myanmar; 1 Indonesia; 1 Philippines) as well as queries from private sector. Preparations for the training are currently being done.

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1. Updates on SEAFDEC/AQD Resource Enhancement Activities, Regional Technical Meeting on Resource Enhancement in SEA, Bangkok Thailand, 24-26 April 2018.	PPT	
2. 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.	Special publication by SEAFDEC	Shelah - sp15-3 initiating resource enhancement of seahorse.pdf

#### 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	Project reached 75% completion; sub-activities on nutritional quality, protein enrichment of ABPs, pesticide residue levels and anti-nutritional factors (ANFs) determined to assess suitability of ABPs as feed ingredients. Information on the effect of mango peel silage on reproductive performance of tilapia broodstock reared in tanks and lake-based cages determined. Preliminary studies to determine optimal inclusion level of ABPs in tilapia feeds were conducted. Preliminary study information disseminated during the regular AQD training courses and during BFAR training. Positive feedback from the evaluators during the 2017 Annual Review of GOJ-funded projects.
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	This activity consistently obtained high rating (8-10/10) during GOJ Annual Project Review and Evaluation. The Community-Based Resource Enhancement (CBRE) is now used to refer to this successful project with fisherfolk and local government stakeholders in Molocaboc Island and results are witnessed by AQD's abalone and sandfish training course participants.
Sub-activity 2.2: Promotion of resource enhancement of seahorses	Positive review during February 2017 Annual Evaluation. Pilot community-based hatchery of seahorse in Molocaboc Island visited by local communities, BFAR personnel and trainees/students.
Activity 3: Technology extension and demonstration	

Planned activity	Evaluation/ Views from Participants
Sub-activity 3.1 Marine fish hatchery training program	Participants evaluated relevance of topics (4.53); technical knowledge learned (4.60); trainees confidence to do duties upon return (4.53); overall coordination of training activities (4.47), on a scale of one to five (lowest to highest).
Sub-activity 3.2 Rural aquaculture program	Not applicable at the moment. To be conducted Nov. 20- Dec. 4, 2018.

## 6. Major Impacts/Issues

Activity 2.1: Operation of the newly constructed solar and petrol-powered abalone hatchery started at demo-scale as the building needs structural reinforcement. Sandfish catch size regulation at 320g weight promoted to local gleaners and village officials. Two CBRE replicates initiated and on-going. Freeze-drying trials for abalone harvest initiated to improve market potentials and sustainability of livelihoods.

Activity 2.2: Supply of seahorse juveniles from the hatchery is affected by limited availability of live feed for newborn seahorses.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2019

### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
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	Growth trials will be conducted in lake-based cage conditions to evaluate the effects of different tilapia diets containing agricultural wastes and by-products on production parameters. A subsequent cage trial will use the best performing tilapia diet and compare alternate day feeding with daily feeding on growth performance and feed conversion efficiency of Nile tilapia. An economic analysis will be carried out to determine the most cost-effective feed and feeding strategy for adoption of farmers.	8,800
Sub-activity 1.2: Responsible aquaculture through aquasilviculture	Three types of responsible culture systems will be compared in relation to shrimp performance including disease tolerance: 1) separate aquasilviculture pond; 2) mixed aquasilviculture pond; 3) ponds without mangrove using protocols established in GoJ TF5-use of greenwater system/polyculture with tilapia.	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	For 2019, the study will conduct the following: 1) further exit strategies such as ensuring strong fisherfolk association, consistent compliance to catch-size regulations, and further freeze-drying trials to enhance market potentials and related livelihoods to sustain the CBRE project in Molocaboc in terms of continuous economic benefits for fisherfolks and guaranty success for other stakeholders such as the PAMB-SMR and SEAFDEC/AQD-GOJTF; 2) collaborate with relevant LGU and fisherfolks such as those in Camarines Sur to establish CBRE replicate sites, and 3) assessment	15,000

<b>Proposed Activity</b>	<b>Description of Proposed Activity</b>	<b>Proposed Budget</b>
	surveys and other strategies to assess the impacts, cost and benefits of resource enhancement to stakeholders.	
Sub-activity 2.2: Promotion of resource enhancement of seahorses	To promote resource enhancement of seahorses. Specific objectives: to continue with the trials on nursery rearing of seahorse in Molocaboc Island; to determine the appropriate time of release; to determine growth and survival of the released seahorses; to intensify the involvement of the community in the management of the natural resources; and to establish a community-based hatchery for seahorses.	8,800
Activity 3: Technology extension and demonstration		
Sub-activity 3.1: Marine fish hatchery training program	Intensification of aquaculture through seed production of high-value marine fish species continues to develop rapidly in Southeast Asia. This 37-days training program will extend and demonstrate the breeding, hatchery seed production, nutrition and health management in milkfish, grouper, Asian seabass, mangrove red snapper, rabbitfish and pompano	7,500
Sub-activity 3.2: Rural aquaculture program		8,500
Activity 4: Publication		0
Activity 5: Annual progress meeting and international workshop		
Sub-activity 5.1: Annual progress meeting	Annual progress meeting will be held to review the project achievement. Evaluators will be invited to join the meeting to review/evaluate the project achievements.	3,140
Sub-activity 5.2: International workshop		0
Activity 6: Coordination by Project Leader	The project leader will coordinate and assist the research and dissemination, and also facilitate information exchange not only between activities but also among Member Countries so that environment-friendly resource enhancement will be effectively promoted in Southeast Asia. Semi-annual meeting will be held on July or 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.	4,000

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
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	Information on the most cost-effective tilapia feed and feeding strategy determined.
Sub-activity 1.2: Responsible aquaculture through aquasilviculture	Information on which culture system gives better shrimp yield that could be disseminated to small-scale shrimp farmers for use.
Activity 2: Promotion of community-based production and resource enhancement of high-value aquatic resources	

Proposed Activity	Expected Outcomes/Outputs of Activity
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	Fisherfolks trained to operate the solar and fuel-powered abalone hatchery and seeds released to sustain the CBRE sites. Catch of abalone and sandfish by fisherfolks in the CBRE release site and spill-overs sustained. Replicate sites established with other collaborators. Socioeconomic impact, cost and benefits from CBRE determined to provide basis for policy recommendations to support aquaculture-based resource enhancement.
Sub-activity 2.2: Promotion of resource enhancement of seahorses	Appropriate time of release determined; growth and survival of the released seahorses determined; active and participatory involvement of the community in the management of the natural resources promoted; establish hatchery and nursery culture of juvenile seahorses.
Activity 3: Technology extension and demonstration	
Sub-activity 3.1: Marine fish hatchery training program	Extending the technologies generated by SEAFDEC/AQD through hands-on training on seed production of marine fish species such as milkfish, Asian seabass, mangrove red snapper, rabbitfish and pompano for SEAFDEC and non-SEAFDEC Member Countries. GOJ- funded trainees submit narrative report.
Sub-activity 3.2: Rural aquaculture program	Extending the technologies generated by SEAFDEC/AQD through hands-on training on the seed production of freshwater species such as tilapia, catfish, bighead carp and freshwater prawn to rural member and non-Member Countries to hasten economic development in Southeast Asia. GOJ-funded trainees present and submit project proposal for a rural community.

### 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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												
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												
Sub-activity 2.2: Promotion of resource enhancement of seahorses												
Activity 3: Technology extension and demonstration												
Sub-activity 3.1 Marine fish hatchery training program												
Sub-activity 3.2: Rural aquaculture program												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201503001
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region		
<b>Strategy:</b>	II	<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD383,107
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 65,510
<b>Project Leader:</b>	Koh-ichiro Mori, AQD DC	<b>Involved Country:</b>	SEAFDEC 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” is being 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 day 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 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 the Member Countries, 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 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	Outcome	Output	Activity
Objective 1: To develop and accelerate rapid and effective fish and shrimp health management	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 - Determination of threshold infection levels for WSSV and other pathogen such as VP <sub>AHPND</sub> - Development of optimized q-PCR protocols for the detection of 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.  Development of the method of delivering	Activity 2: Enhancement of efficacy of vaccine treatment in tropical cultured species - Evaluation of the field (earthen pond) efficacy of the inactivated NNV vaccine against natural or experimental NNV infection - Examination of the combined effects of inactivated vaccine plus live NNV in grouper concomitant to immunogenicity (antibody titer level), conferment of protection (RPS), and suppression of NNV replication (NNV titer) in the brain of fish. - Evaluation of the efficacy of RNAi in protecting shrimp against WSSV infection

Objective	Outcome	Output	Activity
		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"> <li>- Development of delivery scheme using a combination of the antiviral treatments</li> <li>- Development of low-cost delivery method for the antiviral treatments: tank studies</li> <li>- Field Efficacy Evaluation of the combined antiviral treatment</li> </ul>
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"> <li>- 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</li> </ul>
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"> <li>- Development of the protective measures against EMS, based on the etiological agents together with identification of risk and protective factors.</li> <li>- Establishment of guidelines to protect shrimp from EMS.</li> </ul>
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"> <li>- Implementation of training programs on specific topics based on the request from Member Countries, which necessitate the information dissemination on fish health management.</li> </ul>

### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Development and acceleration of rapid and effective fish and shrimp health management	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 <sub>AHPND</sub> 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

Activity	Description
	<p>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. The objective of the study is to develop a new approach of enhancing the immunity of fish against NNV infection through the administration of inactivated NNV vaccine plus live NNV in groupers that will be reared in earthen ponds or floating net cages in the open sea. Specifically, the combined effects of this new approach will be examined in conjunction with immunogenicity (antibody titer level), conferment of protection (RPS), and suppression of NNV replication (NNV titer) in the brain of naturally or experimentally infected fish. The expected output from the study is a practical strategy of preventing VNN in NNV-susceptible fish particularly during the early phase of culture.</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. 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)</p>
<p>Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish</p>	<p>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.</p>
<p>Activity 4: Epidemiology of the Early Mortality Syndrome (EMS) /Acute Hepatopancreatic Necrotic Disease (AHPND)</p>	<p>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</p>

Activity	Description
	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	To make the fish health management effective and functional and to guarantee the sustainable development of aqua food production together with the poverty alleviation in our region, the efforts to extend and demonstrate the technologies obtained in this project to Member Countries are very significant. Not only the knowledge and technologies are delivered but a follow-up survey is also implemented to facilitate the dissemination so that information will effectively reach to aqua-farmers, fish health managers, LGU officers, etc. (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	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.  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.
Activity 8: Coordination by the project leader	The project leader coordinates and encourages the research, training and dissemination, and also facilitate information exchange not only between activities but also among Member Countries.

### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 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	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
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
<b>Sub-Total Budget</b>		<b>81,438</b>	<b>66,159</b>	<b>67,000</b>	<b>103,000</b>	<b>65,510</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

Activity 1) Standard curve has been established using WSSV plasmid. Preliminary infection experiment for the determination of LD<sub>50</sub> for the 4 weight ranges have been conducted. Time course experiment for 4 weight ranges has been completed. The time course experiment was conducted to determine the threshold level of WSSV infection. Activity 2-1) Field efficacy of the formalin-inactivated NNV vaccine previously developed in JTF5 was elucidated in pond-reared groupers, Activity 2-2) *In vivo* evaluation of the dsRNA efficacy in protecting shrimp against WSSV Activity 3) Evaluation of the efficacy of garlic extract using allicin powder and oral treatments against fish parasites, Activity 4) Siganid greenwater provides protection against VP<sub>AHPND</sub> and thus may be used to culture shrimp, and Activity 5) Coordinating with respective Member Countries for what practical training course they need.

### 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 5	II: Training Not				14,000

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
	applicable at the moment.				

### 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 <sub>AHPND</sub> 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 <math>1.6 \times 10^7</math> copies/g.</p> <p>The viral load from natural infection was also measured. Viral load for one-step positive tissues ranges from <math>3.2 \times 10^9</math> to <math>5.1 \times 10^{10}</math> copies/g while the range for the nested positive tissues were from <math>7.4 \times 10^3</math> to <math>1.2 \times 10^5</math> copies/g.</p> <p>In the artificial infection (timecourse experiment), the one-step positive tissues range from 1.2 to <math>5.1 \times 10^9</math> copies/g while the range for nested is from 3.3 to <math>9.3 \times 10^6</math> copies/g.</p> <p>The threshold level of infection for WSSV is between <math>10^5</math> to <math>10^7</math> copies/g where mortality is not yet observed.</p> <p>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.</p> <p>The q-PCR protocol was optimized in TF 5. The protocol was successful and can be used for diagnostic purposes.</p>
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	Field efficacy of formalin-inactivated NNV vaccine elucidated in pond-reared groupers	<p>Grouper juveniles (MBW: <math>8.3 \pm 1.2</math> g) intraperitoneally injected with 100 <math>\mu</math>l of inactivated NNV vaccine (pre-inactivation titer: <math>10^{9.2}</math> TCID<sub>50</sub>/ml) exhibited neutralizing antibody titers from Day 30 (mean titer <math>1:1792 \pm 701</math>) to Day 150 (<math>1:704 \pm 351</math>) with the highest titer observed at Day 60 (<math>1:6656 \pm 3435</math>) 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: <math>21 \pm 3.4</math> g) and L15-injected/control (n=20; <math>20.6 \pm 1</math> g) fish were intramuscularly challenged with NNV (<math>10^{6.3}</math> TCID<sub>50</sub>/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 <math>10^{10.9} \sim 10^{11.4}</math> TCID<sub>50</sub>/g and <math>10^8 \sim 10^{8.9}</math> TCID<sub>50</sub>/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; <math>178 \pm 27</math></p>

Planned activity	Expected outcome/output	Achievements
		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.
Sub-activity 2.2 Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	<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>	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 (2 times before and 2 times after challenge (total = 80 µg/shrimp). Furthermore, the silencing was found to be specific to VP28 dsRNA. In 2018, production of rVP28 and dsRNA and determination of their encapsulation efficiency and yield in chitosan and alginate microparticles were conducted. In the remaining part of 2018, oral delivery using different ratios of dsRNA to rVP28 entrapped in microparticle carriers will be tested by challenge experiments in tanks.
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	<p>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>).</p> <p>To assess the ability of efficacy of garlic extract against infection with sea lice (<i>Caligus</i> sp.) in pompano (<i>Trachinotus blochii</i>).</p>	Oral treatments using allicin powder-supplemented diet (1.25, 2.5, 3.75 and 5g/kg) and a control diet without allicin were tested on tilapia infected with <i>Trichodina</i> sp. for 14 days. Results showed that tilapia fed with allicin powder supplemented diets showed reduced prevalence and mean intensity of <i>Trichodina</i> sp. parasites as compared to the control. Preliminary static bioassay to determine the 96 h LC <sub>50</sub> value of garlic extract in pompano was carried out. The 96-h median lethal concentration (LC <sub>50</sub> ) of allicin powder to pompano for 24, 48, 72 and 96 h of exposure are 29.18, 23.31, 16.79 and 6.64 mg/L respectively. Histopathological analysis is ongoing.
Activity 4: Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)	<p>1. To investigate efficacy of a macroalgae against AHPND.</p> <p>2. To clarify efficiency of greenwater system using siganid against AHPND in a simulated tank experiment.</p>	<p>1. Small tank experiments (2 runs) using Gracilaria were terminated on day 3 due to poor shrimp survival. Furthermore, Gracilaria maintained for 4 weeks prior to stocking with shrimp decayed.</p> <p>2. In the experiment wherein infected shrimp were cultured in SGW and non-SGW simulated environment using fiberglass tank with soil, shrimp survival was higher in SGW (46%) compared to non-SGW (24%). Bigger shrimp were harvested in SGW (ABW=3.9 g, n=58) than in non-SGW (ABW= 1.73; n=58). Shrimp from SGW harbored less <i>Vibrio parahaemolyticus</i> (1.2 x 10<sup>4</sup> cfu/hepatopancreas) compared to those from non-SGW (4.95 x 10<sup>5</sup> cfu/hepato). Results suggests that Sigamid greenwater provides protection against VP<sub>AHPND</sub> and thus may be used to culture shrimp.</p>
Activity 5: Technology extension and demonstration	Assessment of training needs for capacity building of SEAFDEC Member Countries	Coordinating with respective SEAFDE Member Countries for what practical training course they need. Preparations for the training are currently being done.

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1. Shrimp survives exposure to low <i>Vibrio parahaemolyticus</i> AHPND load in the water	Poster presentation and Book of Abstract; 10 <sup>th</sup> Symposium on Diseases in Asian Aquaculture	
2. 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	
3. 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	

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Activity 2	
Sub-activity 2.1	
Sub-activity 2.2	
Activity 3	
Activity 4	
Activity 5	Not applicable at the moment. To be conducted Dec. 2016

#### 6. Major Impacts/Issues

Implementation of these activities and sub-activities were delayed due to delayed budgetary allocation in this year.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1: Development and acceleration of rapid and effective fish and shrimp health management	Development and optimization of conventional and quantitative polymerase chain reaction-based detection method for VP <sub>AHPND</sub> and other pathogens.	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	Intraperitoneal injection with inactivated NNV vaccine followed by injection with live NNV: an effective strategy to boost the immunity of groupers against VNN in groupers	8,800
Sub-activity 2.2 Application	Field trial using microparticle-feed delivered antiviral	10,800



Proposed Activity	Description of Proposed Activity	Proposed Budget
of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	treatments will be conducted based on the best treatment obtained from tank studies. Ponds at Dumangas Brackishwater Station (DBS) will be utilized for the purpose.  (Note: the budget equivalent to about P 440,000.00 will not be enough for field trial as there will be pond repairs, salaries/labor of pond aide, and salary of assistant will be needed).	
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	Experiment on the efficacy of garlic extract against sea lice ( <i>Caligus</i> sp.) infecting the pompano ( <i>Trachinotus blochii</i> ) (i.e. bath and oral treatment) will be conducted in 2019. Histological examination of fish tissues (muscle, liver, and kidney) will be collected and analyzed from the oral treatment.	8,800
Activity 4: Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)	VP <sub>AHPND</sub> infected shrimp will be cultured in a greenwater simulated environment using macroalgae and mussel.	8,800
Activity 5: Technology extension and demonstration	The training aims to enhance the knowledge and skills of the Fish Health personnel, hence, the training will focus on updates (theory) on parasitic and bacterial diseases. In addition, emphasis on hands-on exercises will be targeted as such will be necessary in the conduct of accurate disease diagnosis.	14,000
Activity 6: Publication		0
Activity 7: Annual progress meeting and international workshop		
Sub-activity 7.1 Annual progress meeting	Annual progress meeting will be held to review the project achievement. Evaluators will be invited to join the meeting to review/evaluate the project achievements.	0
Sub-activity 7.2 International workshop		0
Activity 8: Coordination by the project leader	The project leader will coordinate and assist the research and dissemination, and also facilitate information exchange not only between activities but also among Member Countries so that environment-friendly resource enhancement will be effectively promoted in Southeast Asia. Semi-annual meeting will be held on July or 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.	5,510

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1: Development and acceleration of rapid and effective fish and shrimp health management	<ol style="list-style-type: none"> <li>1. Screening of experimental animal, tissue passage and preparation of bacteria</li> <li>2. Preliminary infection experiment by injection and/or immersion to determine test concentrations based on LD<sub>50</sub></li> <li>3. Infection experiment (Timecourse)               <ul style="list-style-type: none"> <li>- Detection and quantification of plasmid containing <i>PirAB</i> toxins with q-PCR using AP4 and/or Vp3 primers</li> </ul> </li> </ol>
Activity 2: Enhancement of efficacy of vaccine treatment	

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
in tropical cultured species	
Sub-activity 2.1 Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	1. A practical strategy of enhancing the immunity of groupers against a natural/experimental NNV infection via administration of inactivated NNV vaccine followed by booster injection with live NNV established. 2. The combined effects of this new approach in conjunction with immunogenicity (antibody titer level), conferment of protection (RPS), and suppression of NNV replication (NNV titer) in the brain of naturally or experimentally infected fish elucidated.
Sub-activity 2.2 Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	Field trial using oral delivery (through the feed) of the antiviral treatments in microparticle carriers conducted
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	1. Factors associated with the susceptibility or resistance of fish to parasite infection elucidated. 2. Hematological profile of -infected and non-infected fish established. 3. 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)	1. Clarified efficiency of greenwater using a macroalgae and a bivalve in a simulated pond environment. 2. Identified factors affecting the efficiency of the macroalgae and bivalve against VP <sub>AHPND</sub> .
Activity 5: Technology extension and demonstration	1. Persistent diseases (parasitic, bacterial, viral) affecting economically important fish species in SEAFDE Member Countries accurately diagnosed by Fish Health personnel using standard procedures 2. Practical and economically sound disease prevention and control strategies appropriate for the identified problem effectively formulated and accordingly disseminated to fish farmers 3. Linkage/ collaboration between DOF staff and industry practitioners/ academe strengthened through participation/ discussions during the on-site training 4. Basic research on fish disease carried out by fish health personnel and research outputs published in refereed journals.

### 3. Schedule of Activity for the Year 2019

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
Activity 1: Development and acceleration of rapid and effective fish and shrimp health management												
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												
Activity 3: Establishment of protective measures against												

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
persistent and emerging parasitic diseases of tropical fish												
Activity 4: Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)												
Activity 5: Technology extension and demonstration												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

	Project id: 201302001		
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	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		
<b>Strategy:</b>	III	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	MFRD	<b>Lead Country:</b>	Singapore
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 274,914
<b>Project Partner:</b>	ASEAN-SEAFDEC Member Countries	<b>Budget for 2019:</b>	USD 39,850
<b>Project Leader:</b>	Ong Yihang, Senior Scientist (PHTD, AVA)	<b>Involved Country:</b>	ASEAN-SEAFDEC 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 SEAFDECC'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 contaminate 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. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

#### 3.1 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 3: To improve knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in the ASEAN	Outcome 3: Improved knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and	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 in 3 <sup>rd</sup> qtr 2019

Objective	Outcomes	Outputs	Activities
region and facilitate information exchange among Member Countries	shellfish in the ASEAN region	Technical Compilation	Preparation and publication of Technical Compilation in 2018/2019
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 <sup>rd</sup> qtr 2015
		End-of-Project (EOP) Meeting	Organization and conduct of End-of-Project (EOP) Meeting in 3 <sup>rd</sup> 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 <sup>nd</sup> 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 <sup>nd</sup> 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 <sup>nd</sup> qtr 2018.

### 3.2 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 <sup>nd</sup> 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 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

Activity	Description
	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 Biotxin-producing HAB species Identification (2 days)	A Regional Technical Consultation meeting (RTC) will be held in Singapore in 3rd 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 <sup>nd</sup> 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 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 <sup>nd</sup> 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 <sup>nd</sup> 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 1 <sup>st</sup> 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	Description
Activity 9: End-of-Project (EOP) Meeting (2 days)	The End-of-Project (EOP) Meeting will be held in the 3 <sup>rd</sup> 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.

### 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: Regional Technical Consultation on Biotoxins (ASP, AZA and BTX) Monitoring in the ASEAN region		35,500	-	-	-	-	-	-
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	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
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
<b>Sub-Total</b>		<b>35,500</b>	<b>28,700</b>	<b>49,200</b>	<b>36,344</b>	<b>40,748</b>	<b>44,572</b>	<b>39,850</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

#### Biotoxin Monitoring Survey

Please update, Report on reminder to call for survey report submission and countries submitted. Country who dropped out. And reasons.

#### Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization

The Regional Training Course was successfully conducted in collaboration with the Institute of Ocean & Earth Science (IOES), University of Malaya (UM) at its Bachok Marine Research Station (BMRS) in Kelantan from 8 - 14 July 2018. The training course, which included both lectures and practical, was designed to expose participants to several aspects of harmful algae bloom monitoring and studies and has included fundamental knowledge of microalgal culturing and maintenance, species identification and detection using fluorescence and electron microscopy and flow cytometry. A total of 20 participants from 10 ASEAN Member Countries attended the training. The participants were satisfied with the course outline in general and they commented that the trainers were knowledgeable and willing to share information. They also felt that the materials and information provided during the course was beneficial to their work.

### 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 7: Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization	II. Training	20	2 (MFRD)	0	38,496

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 3: Biotoxins Monitoring Survey	- Submission of technical reports by Member Countries on the conduct and results of	- Please update which countries have submitted.

Planned activity	Expected outcome/output	Achievements
	their monitoring surveys.	
Activity 7: Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization	<ul style="list-style-type: none"> <li>- Organization and conduct of the training course in 2<sup>nd</sup> quarter 2018 (in collaboration with IOES-UM).</li> <li>- Participation by at least 8 ASEAN-SEAFDEC Member Countries.</li> <li>- Enhanced capabilities on culturing techniques for HAB species, identification and toxin characterization</li> </ul>	<ul style="list-style-type: none"> <li>- A total of 20 participants from 10 ASEAN Member Countries and 2 MFRD representatives attended and benefitted from the training which was successfully conducted by UM, Japanese &amp; Chinese experts on 8-14 July 2018.</li> <li>- The training enhanced the participants' knowledge and capabilities on specimen culturing and maintenance methods; use of fluorescence and electron microscopy, qPCR and flow cytometry and bioinformatics for HAB identification and characterization.</li> </ul>

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
Nil	-	-

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

Planned activity	Evaluation/ Views from Participants
Activity 7: Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization	<p>Participants agreed that the training was well organised and the trainers were very knowledgeable and helpful. They were able to assist the participants and allow them to understand the techniques. Nonetheless, continuous practice is necessary to build up competency.</p> <p>Majority of the participants found the duration of the course was just nice and it engaged them adequately. Some of the participants felt that there should be more hands on. Some of the participants found the course duration short as the course content was packed with information and the course was conducted too fast.</p>

#### 6. Major Impacts/Issues

The training course enhanced capabilities of Member Countries in HAB species culturing, identification and characterization.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 8: Technical Compilation	The Technical Compilation of the project will be prepared from 1 <sup>st</sup> quarter of 2018 after the completion of the biotoxin monitoring surveys in Member Countries, the submission of the results and reports. It will be published in the project's final year in 2019. The Technical Compilation will comprise of information such as the biotoxins analytical methods and biotoxins monitoring survey reports of the Member Countries, the methodologies for the isolation, culturing, preservation,	3,000

Proposed Activity	Description of Proposed Activity	Proposed Budget
	<p>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 directory of responsible national authorities and HAB experts in Member Countries.</p> <p>A technical poster, summarizing useful information derived from the training course on HABs, would be prepared for distribution.</p>	
Activity 9: End-of-Project (EOP) Meeting	The End-of-Project (EOP) Meeting will be held in the 3 <sup>rd</sup> 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.	36,850

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 8: Technical Compilation	Publication and distribution of Technical compilation
Activity 9: End-of-Project (EOP) Meeting	<p>Organization and conduct of the EOP in 2<sup>nd</sup> quarter 2019 (Jul – Sep 2019).</p> <p>Participation by at least 8 ASEAN-SEAFDEC Member Countries.</p>

## 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 8: Technical Compilation												
Circulation of draft to Member Countries												
Publication and distribution of Technical Compilation												
Activity 9: End-of-Project (EOP) Meeting												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

Project id: 201502002			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Cold Chain Management for Seafood		
<b>Strategy:</b>	IV	<b>Total Duration:</b>	2015 - 2018
<b>Lead Department:</b>	MFRD Programmes	<b>Lead Country:</b>	Singapore
<b>Donor/Sponsor:</b>	Singapore	<b>Total Donor Budget:</b>	USD 136,120
<b>Project Partner:</b>	SEAFDEC Member Countries	<b>Budget for 2018:</b>	USD 48,440
<b>Project Leader:</b>	Lim Ying Tsui, Scientist (PHTC, AVA)	<b>Involved Country:</b>	SEAFDEC Member Countries

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

Seafood is a perishable commodity that undergoes several chemical and biological changes immediately after capture. These changes deteriorate the quality and safety of seafood and are hastened by poor temperature control along the supply chain. Proper cold chain management and monitoring at every stage of the supply chain is a critical requirement to extend its shelf-life and ensure its freshness, safety and economic value along the supply chain. This project is funded by Singapore to upgrade the knowledge and technical capability in cold chain management for seafood in the ASEAN region. The objectives of the project are to assist in upgrading the regional seafood industry in cold chain management and technologies, as well as to develop generic guidelines on cold chain management for the ASEAN regional seafood industry. 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 Centre for MFRD Programmes, with participation from the ASEAN-SEAFDEC Member Countries. The key project activities include a Project Inception and Planning Meeting, Workshop on Cold Chain Management for Seafood, Supply Chain/Cold Chain pilot trials in Member Countries, followed by a Project Evaluation and Progress Meeting. Member Countries will use the results and data from the pilot trials, as well as technical knowledge gained from the Workshop, to develop the generic guidelines on cold chain management for seafood for publication. The project would conclude with an End-of-Project Meeting. The expected outputs for this project are: a Workshop on Cold Chain Management for Seafood and a publication on generic guidelines on cold chain management for seafood.

### 2. Background and Justification

Seafood is an important commodity in many ASEAN Member States 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 is accelerated by poor temperature control along the supply chain. Thus, good cold chain management is one of the most critical requirements to keep the seafood product fresh and safe, extend shelf life and to maintain its quality and economic value from catch to consumer.

Throughout the seafood supply chain, the seafood industry relies on proper cold chain to ensure the commercial viability of the seafood products. Modern technologies for seafood production at the aquaculture farms, seafood catch on the fishing vessels, pre-harvest considerations, post-harvest handling techniques, processing, packaging, storage, distribution and transportation modes, wholesale and retail constitute integral parts of the seafood cold chain management process. Only proper management at every stage of this cold chain would enable the supply of fresh, quality, wholesome and safe seafood to

consumers. This cold chain may take various forms including ice, refrigerated seawater, refrigerated compartments and cold stores. Low temperature conditions have to be supported by careful, hygienic handling practices during processing, storage and transportation to effectively reduce the spoilage of fish.

The implementation of cold chain for seafood in the ASEAN region involves a number of challenges. One of the major challenges is the lack of or limited integrated supply chains from farm to fork where each industry player regards itself as a separate entity and does not impose cold chain requirements on the next stage in the supply chain. However, any breakage in the cold chain would have cumulative effects on the final quality of the seafood. The great diversity of species combined with multiple international origins and production methods (fishing or farming) further complicate the cold chain requirements. Secondly, seafood and many other traditional fish products in the ASEAN region are largely handled by small and medium-sized establishments which lack appropriate facilities, technologies and knowledge in adopting cold chain practices. Lastly, cold chain management is still seen as non-mandatory in many countries; some cold chain guidelines may have been established but cannot be enforced as regulation.

Notwithstanding these challenges, there is substantial opportunity to create a platform for the ASEAN region to share knowledge, experiences and cost-effective technologies on the cold chain management for seafood. A set of general guidelines may be established to serve as a benchmark for when developing their own national guidelines. Cold chain management of seafood should be promoted to safeguard consumer health and food security and to ensure the sustainability of the seafood industry.

The project is proposed based on the following Resolution and Plan of Action as endorsed at the ASEAN-SEAFDEC Conference of 2011:

Resolution 20: Optimise the utilisation of catch from water to market by reducing post-harvest losses and waste to increase fish supply and improve economic returns through promotion of appropriate technologies and facilities along the supply chain.

Plan of Action D58: Introduce and provide support for the development and application of technologies that optimise the utilisation of catch, reduce post-harvest losses, wastes and discards in commercial and small-scale fisheries and processing operations, through improved processing, facilities and infrastructure development, on-board and on-shore handling, storage, distribution and marketing of fish and fishery products.

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.

### 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 assist in upgrading the regional seafood industry in cold chain management and technologies.	Outcome 1: Establishment and improvement of cold chain management and technologies in the regional seafood industry.	Output 1: Workshop on Cold Chain Management of Seafood.  Output 2: Supply Chain/ Cold Chain Pilot Trials	Activity 1: Organization and conduct of Project Inception and Planning Meeting, 19 – 20 May 2015, Singapore.  Activity 2: Organization and conduct of Workshop on Cold Chain Management for Seafood, 17 – 19 November 2015, Singapore.  Activity 3: Organization and conduct of one-year

Objective	Outcomes	Outputs	Activities
			Supply Chain/ Cold Chain pilot trials in participating Member Countries in 2016.  Activity 4: Organization and conduct of Project Evaluation and Progress Meeting, 25 – 27 July 2017, Singapore.
Objective 2: To develop generic guidelines on cold chain management for the seafood industry in the region.	Outcome 2: Development of generic guidelines on cold chain management for seafood.	Output 3: Generic guidelines on cold chain management for seafood.	Activity 5: Preparation and publication of Guidelines on Cold Chain Management for Seafood in 2017
		Output 4: End-of-Project Meeting	Activity 6: Organization and conduct of End-of-Project Meeting in 4 <sup>th</sup> qtr of 2017

### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Project Inception and Planning Meeting	A 2-day Project Inception and Planning Meeting will be held in Singapore to discuss and plan for all project activities. Two participants each from Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam who are involved in the seafood industry will be invited to attend; one of whom should be from the private sector. The meeting will provide an opportunity for a better overview and understanding of the seafood cold chain resources and practices in these countries, and briefly assess the requirements/deliverables for each project activity. The meeting will also identify the key project leader in each country and commercial co-operants, if any, for the project.
Activity 2: Workshop on Cold Chain Management for Seafood	<p>A Regional Workshop on Cold Chain Management for Seafood will be organized by MFRD and conducted in Singapore. MFRD proposes to engage an overseas expert in seafood cold chain management to be the resource speaker/trainer for this workshop. Two participants from each country will be invited to attend, one of whom should be from the private sector. The workshop will include lectures and hands-on practicals on the best practices and technologies for seafood cold chain management, incorporating discussion of end-user and food safety specifications. Participants will learn the temperature logging techniques to monitor the cold chain from harvest to end-user/consumer, with measurement of product quality parameters (e.g. microbiological analyses, drip loss, quality index development, etc.). Participants will also be taught how to undertake supply chain monitoring within companies or with specific seafood groups, and develop performance indicators to evaluate the impacts of adopting proper cold chain practices in the seafood business. Good manufacturing and handling practices to ensure product safety and quality will also be emphasized in the course. Field visits to a few Singapore seafood companies may be arranged to understand the supply chain practices in Singapore's seafood industry.</p> <p>The workshop will also discuss to agree on the necessary steps and timelines to meet the project objective to develop a set of generic guidelines on cold chain management for the seafood industry in the region.</p>

Activity	Description
Activity 3: Supply Chain/ Cold Chain Pilot Trials	Each participating Member Country will conduct pilot trials to implement cold chain management at either one stage of the seafood supply chain, or across the whole integrated supply chain. The performance of the cold chain practices adoption will be evaluated with the defined criteria by the country. This activity will be conducted for a period of about one year. The results and data of the pilot trials will be useful when developing the generic guidelines on cold chain management for the seafood industry in the region.
Activity 4: Project Evaluation and Progress Meeting	A 3-day Project Evaluation and Progress Meeting will be held in Singapore at the end of the pilot trials to discuss and evaluate the results of the pilot trials and to discuss and plan for the subsequent project activities <i>i.e.</i> drafting of the generic guidelines on cold chain management for seafood and the End-of-Project Seminar. Two participants from each country will be invited to attend.
Activity 5: Preparation and Publication of Guidelines on Cold Chain Management for Seafood	The preliminary draft Guidelines developed by Member Countries at the Project Evaluation and Progress Meeting will be edited by MFRD into a first draft which will be circulated to the relevant authorities in Member Countries for further comments and amendments, if any. MFRD will then revise the first draft into a final draft to be endorsed by Member countries at the End-of-Project Meeting.
Activity 6: End-of-Project Meeting	An End-of-Project Meeting will be organized in Singapore or another Member Country as agreed to share the results of the project among the Member Countries and to finalize and endorse the Guidelines for publication. Two participants from each Member Country will be invited to attend <i>i.e.</i> the Key Project Leader and SEAFDEC National Coordinator.

### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018
Activity 1: Project Inception and Planning Meeting	-	21,720	-	-	
Activity 2: Workshop on Cold Chain Management for	-	55,960	-	-	
Activity 3: Supply Chain/ Cold Chain Pilot Trials	-	-	10,000	-	
Activity 4: Project Evaluation and Progress Meeting	-	-	-	21,720	
Activity 5: Preparation and publication of Guidelines on Cold Chain Management for Seafood	-	-	-	-	5,000
Activity 6: End-of-Project Meeting	-	-	-		21,720
<b>Sub-Total Budget</b>		<b>77,680</b>	<b>10,000</b>	<b>21,720</b>	<b>26,720</b>



## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

#### Activity 6: End-of-Project Meeting

The End-of-Project Meeting was successfully conducted in Singapore from 18 to 20 April 2018 to share the results of the project and to finalise and endorse the final draft of the Guidelines by the Member Countries. The Meeting was attended by 21 participants from both government and private sectors of 10 ASEAN-SEAFDEC Member Countries. The Member Countries presented updates on the implementation status and progress of the seafood cold chain pilot trials conducted as well as discussed and evaluated the results of the pilot trials including issues and challenges encountered during implementation and national activities conducted. Further comments from Member Countries were collated, and the participants discussed and finalised the guidelines on Cold Chain Management for Seafood. The guidelines were distributed to Member Countries for endorsement by the relevant authorities, and will be presented at the next PCM in 2018 for approval to seek endorsement at the next SEAFDEC Council Meeting and AFCF in February 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 5: Preparation and publication of Guidelines on Cold Chain Management for Seafood	IV. Policy development activities	10 Member Countries	-	-	-
Activity 6: End-of-Project Meeting	VI. Others	10 Member Countries	-	-	19,264.42

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 5: Preparation and publication of Guidelines on Cold Chain Management for Seafood	1. Guidelines on Cold Chain Management for Seafood	1. Further comments from each member country was collated and discussed at the EOP meeting. Guidelines were finalised and distributed for endorsement by the relevant authorities from the Member Countries. The final draft of guideline will be presented to the next PCM in 2019 for approval to be submitted to SEAFDEC Council Meeting in Feb 2019.
Activity 6: End-of-Project Meeting	1. Organization and conduct of End-of-Project Meeting in 1 <sup>st</sup> qtr of 2018	1. The 2-day meeting was successfully organised and conducted in Singapore from 18-20 Apr 2018. 2. The meeting was attended by 21 participants from both government and private sectors of the 10 SEAFDEC Member Countries. 3. The progress, challenges, and issues faced in implementing good cold chain practices within each country was discussed. 4. Future activities such as publication of the Guidelines were discussed.

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
Regional Guidelines on Cold Chain Management of Fish and Fishery Products in ASEAN Region (by end 2017)	Print	-

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

Planned activity	Evaluation/ Views from Participants
Activity 6: End-of-Project Meeting	The meeting had achieved its objectives and also met the expectations of the majority of the participants who had positive feedback on its organization and conduct.

#### 6. Major Impacts/Issues

Member Countries benefitted from their conduct of pilot cold chain trials as it enabled them to identify the gaps in their cold supply chain and to rectify the gaps to improve the cold chain management and monitoring for their targeted seafood commodities. The results and data obtained in the pilot trials also provided useful information when developing the generic guidelines on cold chain management for the seafood industry in the region.

Cambodia and Lao PDR informed the meeting that they were unable to extract the temperature data from the button-type data loggers and its readers due to issues with obtaining the licence for the software programme required to read temperature data from the logger provided. MFRD has since provided assistance to both Lao PDR and Cambodia on the procedure to purchase and obtain the software licence. Cambodia had also faced other challenges in its implementation of cold chain pilot trials, such as tight budgets resulting in less samples taken and an uncooperative industry due to their lack of understanding on cold chain management.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 5: Preparation and Publication of Guidelines on Cold Chain Management for Seafood	The draft Guidelines developed by Member Countries at the Project Evaluation and Progress Meeting will be put up at next SEAFDEC, AFCE, ASWGF meetings for endorsement. MFRD will then send it for printing.	5,000

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 5: Preparation and Publication of Guidelines on Cold Chain Management for Seafood	Publication and distribution of Guidelines

#### 3. Schedule of Activity for the Year 2019

The publication should be printed by Dec 2019.

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 5: Preparation and Publication of Guidelines on Cold Chain Management for Seafood												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201304001
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products		
<b>Strategy:</b>	IV	<b>Total Duration:</b>	2013-2019
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Malaysia
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD181,442
<b>Project Partner:</b>	Secretariat	<b>Budget for 2019:</b>	USD 26,730
<b>Project Leader:</b>	Abdul Razak Bin Latun	<b>Involved Country:</b>	SEAFDEC Member Countries

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

Illegal, unreported and unregulated (IUU) fishing was identified as the biggest threat to the sustainable development of fisheries and aquaculture in the Asia-Pacific region (29th Session of APFIC). To combat IUU fishing, countries are asked to take actions among others to adopt on sub-regional cooperation in preventing, deterring and eliminating IUU fishing in the region. In response to this, the issue on management of fishing capacity and combating IUU fishing has been seriously addressed by ASEAN, SEAFDEC and the RPOA initiative to combat IUU fishing, as well as in the “Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020” adopted by the Ministers and Senior Officials during the ASEAN-SEAFDEC Conference in 2011. In addition to the afore-mentioned regional initiatives, there have been emerging trade-related measures and requirements aiming to combat IUU fishing and enhance responsible fishing practices, among which is the European Council Regulation (EC) No. 1005/2008. Therefore, it is urgently needed for Southeast Asian Countries to strengthen measures to exclude IUU origin fish and fishery products from the supply chain. In this regard, this program is aiming at formulation and dissemination of the “ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain” and establishment of an ASEAN Catch Documentation Scheme (ACDS). The guidelines and ACDS will serve as tools for Southeast Asian countries to combat IUU fisheries through controlling and monitoring trade of fish and fisheries products and help Southeast Asian countries to comply with IUU related trade measures.

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

#### 3.1 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 1.1 Core Expert Meeting 1.2 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

#### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Meetings for Effective Program Implementation	Core Expert Meetings (CEM) and Regional Technical Consultations (RTC) will be held for effective program implementation. The meetings were held in 2013, 2014, 2016 and 2017 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 IUU project will convene in 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-	MFRDMD will study 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

Activity	Description
scale fishery	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

### 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: Meetings for Effective Program Implementation	Sub-activity 1.1 Core Expert Meetings	32,604		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	396	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
<b>Sub-Total Budget</b>		<b>33,000</b>	<b>18,000</b>	<b>33,000</b>	<b>12,884</b>	<b>27,331</b>	<b>29,896</b>	<b>26,730</b>

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

MFRDMD compiled and summarized the feedback from 7 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, and Thailand. An interim report of the feedback and self-evaluation conducted on the implementation of the ASEAN Guidelines by visited AMSs will be published in 2018.

MFRDMD collaborated with the SEAFDEC/Sec to establish and implement a pilot project of the e-ASEAN Catch Documentation Scheme (eACDS) in Brunei Darussalam. The introduction of e-ACDS was launched during 49<sup>th</sup> SEAFDEC Council Meeting in Brunei Darussalam in April 2017. MFRDMD in collaboration with SEAFDEC/Secretariat conducted a 3rd on-site testing activities on e-ACDS through meetings and discussions with the relevant stakeholders and relevant government officials in Brunei Darussalam in March, 2018. An evaluation of the e-ACDS implementation in Brunei will be conducted, issues identified and the result of the implementation will be presented at the 2018 PCM and 2019 Council Meeting.

## 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: Core Expert Meetings / Regional Technical Consultation (RTC)	Policy Development				
Activity 2					
Sub-activity 2.2: Consideration of possible solutions to the problems	Information collected during country visits to Malaysia, Indonesia, Philippines, Cambodia, Myanmar LAO PDR and Thailand	7	2 MFRDMD		20,171
Activity 3					
Sub-activity 3.1: Establishment and dissemination of a catch documentation scheme for ASEAN countries	Policy Development	12 Brunei DS	1 MFRDMD		3,742

## 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 2		
Sub-activity 2.2: Consideration of possible solutions to the problems	Consultative meeting in AMSs to compilation information on the current status of implementation of the ASEAN Guidelines on preventing entry of fish and fishery products from IUU fishing activities into the supply chain.	MFRDMD compiled and summarized the feedback from 6 AMSs on the current status of implementation of the ASEAN Guidelines in AMSs based on information gathered during consultative visits to Malaysia, Indonesia, Philippines, Cambodia, Myanmar and LAO PDR. An interim report of the feedback and self-evaluation conducted on the implementation of the ASEAN Guidelines by visited AMSs will be published in 2018 (budget permitting).  Scores of self evaluation on implementation of the ASEAN Guidelines in AMSs:- 1. Malaysia (92.4%) 2. Indonesia (96.4%) 3. Philippines (96.4%) 4. Cambodia (84.8%)
Activity 3		
Sub-activity 3.1: Establishment and dissemination of a catch documentation scheme for ASEAN countries	The launched of the introduction electronic version of ASEAN Catch Documentation Scheme (eACDS)	The introduction of e-ACDS (electronic ASEAN Catch Documentation Scheme) was launched during the Meeting of SEAFDEC Council in Brunei Darussalam in April 2017. MFRDMD in collaboration with SEAFDEC/Secretariat conducted a 3 <sup>rd</sup> on-site testing activities on e-ACDS through meetings and discussions with the relevant

Planned activity	Expected outcome/output	Achievements
		stakeholders and relevant government officials in Brunei Darussalam in March 2018. During this 3 <sup>rd</sup> on-site testing, a kick-start for e-ACDS implementation in Brunei was undertaken involving fishing masters, boat owners, importers, exporters and fish processors. An evaluation of the e-ACDS implementation in Brunei will be conducted, issues identified and the result of the implementation will be presented at the 2018 PCM and 2019 Council Meeting.

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1. Abdul Razak Latun and Mazalina Ali (2018). Report of the 2 <sup>nd</sup> 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 "	Print	-
2. Abdul Razak Latun and Mazalina Ali (2018). 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	-

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

Planned activity	Evaluation/ Views from Participants
Activity 2	
Sub-activity 2.2: Consideration of possible solutions to the problems	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: Establishment and dissemination of a catch documentation scheme for ASEAN countries	The relevant stakeholders and government officials in Brunei Darussalam learned the usage of e-ACDS during the onsite testing for establishment and implementation of the e-ACDS.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
Sub-activity 1.2 Terminal Core Expert Meeting	MFRDMD will conduct Terminal Core Expert Meeting in the third quarter of 2019.	24,399
Activity 3		
Sub-activity 3.1: Establishment and dissemination of a catch documentation scheme for ASEAN countries	MFRDMD in collaboration with SEAFDEC/Secretariat will continue to monitor and assess implementation of the eACDS through meeting and discussion with the relevant stakeholders and government officials in Brunei Darussalam.	2,331

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
Sub-activity 1.2 Terminal Core Expert Meeting	The Terminal 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 will be held in the third quarter of 2019 in Kuala Lumpur, Malaysia to clarify current status and issues in implementation of the ASEAN Guidelines in AMSs, also the way forward after the project termination. The meeting report will be published in the end of 2019 or early 2020.
Activity 3	
Sub-activity 3.1: Establishment and dissemination of a catch documentation scheme for ASEAN countries	Establish and implement the e-ACDS in Brunei Darussalam. Sharing with all AMSs lessons learned during establishment and implementation of the e-ACDS in Brunei Darussalam and finally helping other AMSs to implement eACDS.

## 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activity 1.2:												
Activity 3												
Sub-activity 3.1			TBC **				TBC **					

\*\* TBC – To be confirmed with SEAFDEC Secretariat



**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

Project id: 201306001

<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Assistance for Capacity Building in the Region to Address International Fish Trade-related Issues		
<b>Strategy:</b>	V	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	Secretariat	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	Estimated USD 706,943
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 71,860
<b>Project Leader:</b>	Worawit Wanchana	<b>Involved Country:</b>	SEAFDEC Members Countries

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

Recognizing the issues on trade in fish and fish products are greatly discussed and driven by international market and by various organizations, which rarely involve from fisheries authorities and sometimes lack of contribution to sustainable fisheries development and management aspects. A number of international instruments have been agreed or enforced by international organizations could determine impacts on sustainable development of fisheries in the Southeast Asian region, particularly developing countries where most of fisheries contribution come from small-scale fisheries sub-sector. In accordance to this, it is important to not only reconcile the international driven issues with the promotion on sustainable fisheries development, but more active evaluate the regional impact and addressing the regional concerns to the international fora are also needed.

### 2. Background and Justification

Since 1990s, SEAFDEC has monitored the potential international issues on fish and fish products and provided regional consultative forum to the ASEAN-SEAFDEC Member Countries, through this mechanism SEAFDEC provides fisheries authority of Member Countries with necessary information of the 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 large group of importer like EC and USA. Through the technical consultation, the results of regional discussions and conclusion were analyzed and came up with recommendation for national/regional action plan as well as the regional common/coordinated position to safeguard the interests of ASEAN-SEAFDEC Member Countries at the global fora. Therefore, it is crucial that SEAFDEC should keep monitoring the emerging international fish trade-related issues as well as environment-related task and fisheries-related issues, meanwhile it is also need to provide support to Member Countries through appropriate channels in order to reflect the regional collaborative efforts in managing fisheries and assist the Member Countries in developing regional common/coordinated positions, as well as push forward integration of views from fisheries agencies into those international instruments.

This project supports the 2011 ASEAN-SEAFDEC RES. No. 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"

Recognizing the importance of continuous monitoring and responding to the issue of the international trade of fish and fish products, including CDS and CITES, it is proposed to extend the project 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:	Outcome 1: ASEAN Member States have increased their understanding and knowledge on the impact from the International Fish Trade-related issues, such as CITES-related issues, driven from market measures, IUU fishing, etc.	Output 1: Increased the 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 & Enhancing the Capacity on International Fish Trade-related Issues
Objective 2:	Outcome 2: Increasing the cooperation among ASEAN-SEAFDEC Member Countries to protect their fisheries and aquaculture development through the development of regional common/ coordinated positions on the international fish trade-related issues.	Output 2: Adopted/ agreed on ASEAN-SEAFDEC common position and/or coordinated position and regional policy recommendation 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 the awareness and disseminating from the Project outputs

#### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Monitoring & Enhancing the Capacity on International Fish Trade-related Issues	With the aims 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 the capacity and knowledge among the ASEAN-SEAFDEC Member Countries on the current movement of the international fish trade-related issues, and to encourage country's participation to the fora. In order to meet the objectives, the in-depth study on specific subjects is conducted 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 consideration and information.
Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations	This is the key activity of the project, SEAFDEC will provide platform for Regional Consultation Meeting 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 the RTC are the regional interest to be address at the International fora such as the draft of Regional Policy Recommendation, the ASEAN-SEAFDEC Coordinated Position and ASEAN Common Position. This draft would be further submission to the SEAFDEC Council director for endorsement and also submission to ASEAN for Common Position.
Activity 3: Building the awareness and disseminating from the Project outputs	Dissemination and promotion of the outputs from the project such as regional policy recommendations, ASEAN-SEAFDEC Coordination Positions and ASEAN Common Position to the public within and 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 the 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 Common/ coordinated position and policy recommendation	60,000	119,000	104,113	96,100	51,860	78,370	52,300
Activity 3	Sub-activity 3.1: Publicize the results within and outside the region	1,300	1,000	780	2,000	23,000	5,000	3,910
<b>Sub-Total Budget</b>		<b>80,000</b>	<b>139,000</b>	<b>108,983</b>	<b>131,470</b>	<b>95,260</b>	<b>80,370</b>	<b>71,860</b>

Remark: \* CITES Meeting on the year of 2013, 2016 and 2019

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

The key achievements of the project implementation for the year 2018 are as follows:

#### 1.1 Regional Policy Formulation

*SEAFDEC Regional Technical Consultation on International Fisheries-related Issues, Bangkok, 20-22 June 2018*

- Actions at national and regional level, and views to be reflected at the 33<sup>rd</sup> COFI Meeting of FAO on the following international fisheries-related issues:
  - Combating Illegal, Unreported and Unregulated (IUU) Fishing: Port State Measures; Global Record of Fishing Vessels
  - Small-scale and artisanal fisheries governance: Voluntary Guidelines for Securing Small-scale Fisheries (Status and International Approaches); Labor and Working Conditions and Social Sustainability in Fisheries Value Chains in Fisheries Sectors
  - Fish trade-related issues: Catch Documentation Scheme (CDS); Biodiversity and CITES-related matters; Impact of Marine Protected Areas on Livelihoods; Food Safety and Quality, and Market Access; Fisheries Subsidies
  - Inland fisheries
  - Sustainable aquaculture
  - Climate change and other environment-related issues
  - Global and regional ocean process
  - Marking of fishing gears to reduce abandoned and lost gears

## 1.2 Capacity Building of the ASEAN Member States and Information Dissemination of the Project Outputs/Results

*Printing of eACDS publications, media and other supplies to support the promotion of the eACDS in Southeast Asia in 2018-2019*

- eACDS Manual
- eACDS Guide Book
- eACDS VDO
- eACDS promotion materials

*Organization of the 3<sup>rd</sup> Onsite Training and Kickoff the Pilot Testing on the eACDS, Brunei Darussalam, 1-6 April 2018*

*Visit Myanmar for Introduction of eACDS and Observing Existing Port Control and Fishing Licensing for Future Improvement of Effective Management Scheme, Yangon, 11-14 June 2018*

*Conducting eACDS Activities in (1) Viet Nam in Hanoi on 11-14 September 2018; and Myanmar in Yangon on 25-28 September 2018*

*Development of eACDS in Viet Nam (target of completion in 2019)*

## 1.3 Participation of SEAFDEC at International/Regional Fora

*FAO Panel “Fighting IUU Fishing and Seafood Fraud: Enhancing Traceability and Transparency through Strengthened Governance Frameworks”, 11 March 2018*

- To improve international cooperation to ensure the effectiveness of market-related measures, covering public-private coordination and the industry’s key role in the broader context of complementary international instruments, regional mechanisms, and national laws that make up the global governance framework in the fisheries sector.
- SEAFDEC to join the FAO Panel as the panelist and co-speaker in this event

*14<sup>th</sup> Meeting of ASEAN Working Group on CITES and Wildlife Enforcement (AWG CITES-WE), Luangprabang, Lao PDR, 20-22 March 2018*

- SEAFDEC presented “Progress and Status of Issues with Regards to Endangered Aquatic Species”

*The CITES International Technical Workshop on Eels (*Anguilla spp.*), London, 18-20 April 2018*

- SEAFDEC presented preliminary result of the findings from the regional project on “Enhancing Sustainable Utilization and Management of Tropical Anguillid Eel Resources in Southeast Asia”

## 2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity	Number of Participants and Audients			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1: Monitoring & Enhancing the Capacity on International Fish Trade-related Issues					
Sub-activity 1.1 Review the status of international fish trade-related issues					
<i>Organization of internal meeting on eACDS Plan</i>	Collabo. program		20		157
Sub-activity 1.2: Coordinate and address the Regional Issues to other regional and international organizations					
<i>Participation of project staff to FAO Panel “Fighting IUU Fishing and Seafood Fraud: Enhancing Traceability and Transparency through Strengthened Governance Frameworks, Boston, USA, 11 March 2018</i>	Policy and Information		3		4,700

List of Actual Sub-activity	Type of activity	Number of Participants and Audients			Spent Budget (USD)
		MCs	SEAFDEC	Others	
<i>Participation of project staff to 14<sup>th</sup> Meeting of ASEAN Working Group on CITES and Wildlife Enforcement, Luangprabang, Lao PDR, 20-22 March 2018</i>	Policy and Information		3		600
<i>Participation of project staff to CITES International Technical Workshop on Eels, London, England, 18-20 April 2018</i>	Policy and Information		3		7,000
<i>Conducting eACDS activities, Hanoi, Viet Nam, 11-14 September 2018</i>	Collabo. program		4	2	6,000
<i>Conducting eACDS activities, Yangon, Myanmar, 25-28 September 2018</i>	Collabo. program		2	2	4,500
<i>Developing eACDS for Viet Nam (program development by FMO)</i>	Collabo. program				7,200
<b>Sub-total</b>					<b>30,157</b>
Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations					
Sub-activity 2.1: Provide platform to develop Common/ coordinated position and policy recommendation					
<i>Organization of the 3<sup>rd</sup> Onsite Training and Kickoff the Pilot Testing on the eACDS, Brunei Darussalam, 1-6 April 2018</i>	Collabo. Program	20	10		9,000
<i>Organization of the Regional Technical Consultation on International Fisheries-related Issues, Bangkok, 20-22 June 2018</i>	Policy and Information	22	34		25,770
<i>Consultation visit to Myanmar for introducing eACDS and observing Port control and fishing licensing</i>	Collabo. program	20	6	2	12,000
<b>Sub Total</b>					<b>35,970</b>
Activity 3: Building the awareness and disseminating from the Project outputs					
<i>Printing of eACDS publications, media and others for promoting eACDS in Southeast Asia</i>	Info				20,000
<b>Sub-total</b>					<b>20,000</b>

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1: Monitoring & Enhancing the Capacity on International Fish Trade-related Issues		
<u>Sub-activity 1.1 Review the status of international fish trade-related issues</u> <i>Organization of internal meeting on eACDS plan</i>	Updating project staff on work progress and future plan of activities in promoting eACDS in the region	<ul style="list-style-type: none"> <li>- Plan of activities for promoting the traceability system through the catch documentation system in 2018 onward: for Viet Nam and Myanmar</li> <li>- Summary of lessons learnt in promoting and developing eACDS in Brunei Darussalam</li> </ul>
<u>Sub-activity 1.2 Coordinate and address regional issues to other regional and international organization</u> <ul style="list-style-type: none"> <li>- Participation to FAO Panel</li> <li>- Participation to AWG CITES WE</li> <li>- Participation to CITES</li> </ul>	Disseminating outputs and promoting the application of the catch document system developed by the project activities, at international, regional, and national levels.	<ul style="list-style-type: none"> <li>- Updated the status for future international management of eels</li> <li>- Dissemination of information obtained from the research of SEAFDEC for sustainable management and conservation of eel resources in Southeast Asia</li> <li>- Updated status and disseminated</li> </ul>

<b>Planned activity</b>	<b>Expected outcome/output</b>	<b>Achievements</b>
<i>International Technical Workshop on Eels</i> - <i>Conducting eACDS activities: Viet Nam and Myanmar</i>		information on endangered commercially aquatic species in the region - Developing an eACDS system for the AMS: Viet Nam and Myanmar
Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations		
- <i>Organization of the 3<sup>rd</sup> Onsite Training and Kickoff the Pilot Testing on the eACDS, Brunei Darussalam, 1-6 April</i>	To start the process for testing the eACDS system in Brunei Darussalam	- Developed training materials/tools for eACDS application
- <i>Organization of the Regional Technical Consultation on International Fisheries-related Issues, Bangkok, 20-22 June 2018</i>	Formulate regional common/coordinated position on the international fisheries related issues.	- A set of national and regional policy recommendations on the international fisheries-related issues (referred to above mentioned outputs)
- <i>Consultation visit to Myanmar for introducing eACDS and observing Port control and fishing license</i>	Plan and activity for developing eACDS for Myanmar	- Agreed and proposed plan and activities of eACDS development in Myanmar
Activity 3: Building the awareness and disseminating from the Project outputs		
<i>Printing of eACDS publications, media, and others for promoting eACDS in Southeast Asia</i>	- A set of publications, media, and others: eACDS manual, guidebook, training materials, promotion materials, etc.	

#### 4. List of Completed Publications and Others

<b>List of completed publications for the year 2018</b>	<b>Type of media</b>	<b>Attached e-file</b>
2) Infographics on ACDS Guide (Second Edition)	Paper (PDF)	

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

<b>Planned activity</b>	<b>Evaluation/ Views from Participants</b>
Activity 1	Not available
Activity 2	Not available
Activity 3	Not available

#### 6. Major Impacts/Issues

After development of e-ACDS which are included all supply chains with aims to increase the traceability of marine capture fisheries. To implement the eACDS, AMSs are requested to compile all stakeholders information into the system, meaning that AMSs need to register all stakeholders which are one of the good management practices. In addition, Monitoring, Control, and Surveillance as well as good governance are the keys activities the AMSs have to implement. By this reason, the eACDS is an effective fisheries management tools that could help AMSs in long term management and this is linked and support the implementation of the EAFM (Ecosystem Approach to Fisheries Management) as well.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1: Monitoring & Enhancing the Capacity on International Fish Trade-related Issues		
Sub-activity 1.1	Review the status of international fish trade-related issues	0
	i. In-depth reviews the proposed listing of CEAS into the CITES Appendices to be addressed at the ASEAN-SEAFDEC Forum as a preparatory process for the inputs to the CITES-COP18 in 2019	
Sub-activity 1.2	Coordinate with other regional and international organizations	1,000
	i. Participate to international forum <i>e.g.</i> FAO	
	ii. Participate to regional forum	
Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations		
Sub-activity 2.1	Provide platform to develop Common/coordinated position or Policy recommendations or adoption of the regional cooperation-related issues	28,000
	i. <i>Brunei Darussalam</i> - Evaluation and monitoring e-ACDS implementation in Brunei Darussalam - Impacts Assessment on the eACDS system in Brunei Darussalam	
	ii. <i>Viet Nam</i> - Promotion and Capacity building on eACDS system in project site for fishery staff and stakeholder, Viet Nam - Evaluation and monitoring e-ACDS implementation in Viet Nam - To expansion eACDS system in Viet Nam	
	iii. <i>Myanmar</i> - Development e-ACDS system in Myanmar in cooperation with FMO - Observation and stakeholder meeting to promote eACDS system and trial e-ACDS system in pilot site in Myanmar (2 times) - Promotion and capacity building on eACDS system for fisheries staff and stakeholder (2 times)	
Sub-activity 2.2	Organization of the Regional Technical Consultation or having a questionnaire survey to develop the ASEAN-SEAFDEC Common Position or Coordinated Position of the CITES-related issues	6,000
Activity 3: Building the awareness and disseminating from the Project outputs		
Sub-activity 3.1	Develop and disseminate the publications-related to international fisheries related issues	860
<b>Total budget</b>		<b>71,860</b>

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1: Monitoring & Enhancing the Capacity on International Fish Trade-related Issues	
Sub-activity 1.1	4) Awareness building on the proposed listing of the CEAS into the CITES Appendices, 5) Capacity building on the status of proposed CEAS and solution to support the development of ASEAN-SEAFDEC Common position
Sub-activity 1.2	Enhanced capacity of AMSs on international fisheries-related issues or emerging issues
Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations	

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
Sub-activity 2.1	Coordination with Member Countries to develop and implement eACDS system to support traceability system for marine production and combating IUU fishing
Sub-activity 2.2	ASEAN-SEAFDEC Common Position and / or Coordinated Position on the CITES-related issues
Activity 3: Building the awareness and disseminating from the Project outputs	
Sub-activity 3.1	Publications-related to Regional Initiatives on Combating IUU fishing and ASEAN-SEAFDEC Common Position

### 3. Schedule of Activity for the Year 2019

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
Activity 1												
Sub-activity 1.1												
Sub-activity 1.2												
Activity 2												
Sub-activity 2.1												
Sub-activity 2.2												
Activity 3												
Sub-activity 3.1												



**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201301006
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2		
<b>Strategy:</b>	VI	<b>Total Duration:</b>	2004 ~
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	None
<b>Donor/Sponsor:</b>	Host Countries of the Survey	<b>Total Donor Budget:</b>	None
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	None (Under Cost sharing Scheme)
<b>Project Leader:</b>	Research and Development Division of SEAFDEC/TD	<b>Involved Country:</b>	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 resources and marine environmental situation by SEAFDEC's research vessel has been on the major mandate of SEAFDEC. After 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 Member Countries, region, sub-regional initiatives on marine fisheries resource exploration and monitor the environmental and human resources development researcher and scientist in the region. The major outputs from the survey is cruise reports, technical documents related to fisheries resource stock status, and other specific requirements, *e.g.* oceanography, 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 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 conduct the marine research 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 fifty six (56) cruises with three major components: (1) fisheries resources research survey; (2) oceanographic and marine environmental survey; (3) onboard navigation and marine engineering training and (4) sea trial on fishing operation, oceanographic instruments and fishing vessel. In year 2018, M.V. SEAFDEC 2 has been assigned for the sub regional collaborative research survey on marine fisheries resources and environmental in the Gulf of Thailand.

### 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 40<sup>th</sup> 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 45<sup>th</sup> 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 2017, the 40<sup>th</sup> Program Committee Meeting of SEAFDEC has adopted the Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand under the SEAFDEC Project entitled Offshore Fisheries Resources Exploration in Southeast Asia with the support from Japanese Government through Japanese Trust Fund for SEAFDEC. During August to October 2018, the cruise survey on marine fisheries resources and marine environment has been carried out in collaboration between Training Department of SEAFDEC, Fisheries Administration of Cambodia and Directorate of Fisheries of Viet Nam. The overall aims of collaborative research survey are; to encourage SEAFDEC Member Countries 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 SEAFDEC's Training and Research Vessel, M.V. SEAFDEC 2.

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

#### 3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: Assist Member Countries to conduct fisheries research resources survey	Outcome 1: Marine Fisheries Resources and Marine Environment survey in Southeast Asia	Output 1: A set of scientific data; Fisheries Resource, Oceanographic Data and the Phytoplankton, Zooplankton, Fish Larvae from the cruise survey	Activity 1: M.V. SEAFDEC 2 No.56-1/2018: Cruise Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand by M.V. SEAFDEC 2 (17 August - 18 October 2018). Total numbers of survey station are 73 stations. Total days of shipboard survey are 63 Days.
Objective 2: Assist Member Countries to build human resources capacity by using M.V. SEAFDEC 2	Outcome 1:	Output 1: 1. Competent researcher in the marine fisheries resources research survey	Activity 2.1: Human resources development through the shipboard survey for Thai and Cambodian Researchers in M.V. SEAFDEC 2 No.56-1/2018, Cruise Collaborative Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand by M.V. SEAFDEC 2 (17 August - 18 October 2018), Total days of

Objective	Outcomes	Outputs	Activities
			shipboard survey are 63 Days.
		2. Ship staffs of SEAFDEC Training Department (Navigator and Engineer)	Activity 2.3: Follow up Program on the Project for Improving Fisheries Research and Training Vessel M.V. SEAFDEC 2

### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 M.V. SEAFDEC 2 No.56-1/2018 Cruise Collaborative Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand by M.V. SEAFDEC 2 (17 August - 18 October 2018) Total days of shipboard survey are 63 Days.	The cruise survey of M.V. SEAFDEC 2 No.56-1/2018 entitled Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand has overall objectives to support SEAFDEC Member Countries to conduct marine fisheries and environment data and 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 Vessel, M.V. SEAFDEC 2. The major envisage outputs of the survey are (i) Baseline data on marine fisheries resources and marine environmental situation for scientific reference as well as the status of marine fisheries resources in the Gulf of Thailand, (ii) Increasing number of experience researchers on marine fisheries resources and marine environment of SEAFDEC Member Countries,(iii) Strengthen 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.
Activity 2 Sub-activity 2.1 Human resources development through the shipboard survey for Vietnamese Researcher in M.V. SEAFDEC2 No.56-1/2018 Cruise Collaborative Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand by M.V. SEAFDEC 2 (17 August - 18 October 2018)	During the cruise survey, researchers of host countries of SEAFDEC MCs has been enhanced on knowledge and experience on the marine fisheries resources and marine environment of SEAFDEC Member Countries. The strengthening on network of fisheries and oceanography scientist/researcher in Southeast Asia is one of the significant subjects that SEAFDEC proposed to develop among SEAFDEC MCs. To support the technique and the study on fisheries resources, oceanography and marine environment, scientists and researchers of Participating Countries have collaborated and shared their experience during the survey. Total number of personal involved in the shipboard survey are 83 person both onboard and supporting officers.
Sub-activity 2.2 Follow up Program for Project for Construction of a fisheries research and Training Vessel	Follow up program for Project for the Construction of the Fisheries Research and Training Vessel is a program to improve capacity of M.V. SEAFDEC 2 after her continuously long service at SEAFDEC for 14 years. SEAFDEC navigators and engineers gained their knowledge on new instruments both navigation aids and engine overall maintenance. Hence, the program enhanced competency of SEAFDEC crew members and better safety for vessel to serve SEAFDEC Member Countries on fisheries resources research survey and shipboard training program.

### 3.3 Activity, Sub-activity and Proposed Budget for 2018-2019

(Unit: USD)

Activity	Description	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1:	Sub-activity 1.1:	Cost sharing					JTF Project Offshore Fisheries	Cost sharing
Activity 2:	Sub-activity 2.1:	Cost sharing						Cost sharing
	Sub-activity 2.2:						JICA	

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

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

The major envisage outputs of the survey are 1) Updating the baseline data on marine fisheries resources and marine environmental situation for scientific reference; 2) Updating status of marine fisheries resources in the Gulf of Thailand; 3) Enhancing the skill and experience on marine fisheries resources and marine environmental of the researchers of SEAFDEC Member Countries 4) Promoting and developing the marine science study in Thailand, Cambodia and Viet Nam; 5) Strengthening network on the marine fisheries resources and marine environmental scientists in the Gulf of Thailand sub-region and 6) Maximizing the efficiencies and benefit of the SEAFDEC research vessel, research equipment through the collaborative research cruise survey of M.V. SEAFDEC 2. Total numbers of survey stations are 73 survey station in the Thailand waters and Cambodia waters.

### 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 Fisheries Resources and Marine Environment Survey M.V. SEAFDEC 2 No.56-1/2018 The Collaborative Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (17 August - 18 October 2018)	I	83	8	2	
Activity 2 Human resources development					
Sub-activity 2.1 Human resources development through the shipboard survey M.V. SEAFDEC 2 No.56-1/2018 The Collaborative Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (17 August - 18 October 2018)	II	83	8	2	
Sub-activity 2.3 Follow up Program on the improve Construction of a fisheries research and training Vessel	II		15		

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1	Complete sampling survey stations	1. Sampling survey of the bottom trawl has been conducted at the survey stations in Thailand and Cambodia waters. There was a total of 73 stations for bottom trawl carried out. 2. There were 73 stations of hydrographic and oceanographic data sampling including, wind, wave, water temperature, salinity, turbidity, chlorophyll-a, current, etc. at the survey stations and sampling of the phytoplankton, zooplankton, and fish larvae at survey stations.
Activity 2		
Sub-activity 2.1:	Experience Thai and Cambodian researchers on the marine fisheries resources survey	During the survey on the M.V. SEAFDEC 2 Cruise No.56-1/2018, the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (17 August - 18 October 2018), Thai and

Planned activity	Expected outcome/output	Achievements
		Cambodian researchers gained knowledge and experience on the marine fisheries resources survey, fishing operation and oceanographic survey as well as the shipboard survey management.
Sub-activity 2.2:	Competent SEAFDEC navigators and engineers in the improvement of M.V.SEAFDEC 2	1) Navigators of M.V.SEAFDEC 2 understood and were able to operate the new instrument <i>e.g.</i> navigation equipment, communication equipment on board M.V.SEAFDEC 2; 2) Engineers of M.V.SEAFDEC 2 gained 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 2018	Type of media	Attached e-file
1. Summary Report on the Regional Technical Meeting on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia, Thailand, and Viet Nam Waters) SEAFDEC Training Department	Hard copy	
2. 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	
3. 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	
4. 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	
5. Draft Standard Operation Procedure Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia, Thailand, and Viet Nam Waters)	Hard copy	
6. 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	

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1	All researchers participated in the survey expressed their satisfaction on the planning, operation and collaboration that implemented by SEAFDEC. However the data analysis is one of the important activities that requires time and budget support.
Activity 2	
Sub-activity 2.1	Participating Countries had limitations for this research study and sought assistance from SEAFDEC and all countries to complete the reports. Participating Countries agreed to develop the technical working group and were interested to assign researchers to join and dispatch.
Sub-activity 2.3	Ship personnel got more knowledge and skill on the instruments installed onboard M.V. SEAFDEC 2 that contribute to long-term enhancement of the staff competency <i>e.g.</i> navigation and engineering.

## 6. Major Impacts/Issues

The survey had major constraints on the weather condition (as affected by the Southeast Monsoon) in the Gulf of Thailand. In some survey areas, fishing ground were risky for trawling resulted in incomplete trawl operation. Due to the long cruise (63 days), M.V. SEAFDEC 2 required full support from the survey administration team of the Training Department both departure and arrival from and to the port of calls.

The concerns of Participating Countries requested the financial support for expenditure of the sample and data analysis, and reporting of the research study. However SEAFDEC/TD cannot support on the data analysis that requested by Participating Countries based on the agreement and conditions. Regulation on the exportation of samples outside countries has been raised by the Participating Countries that restricts the assistance of SEAFDEC on further analysis of the samples.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

(Unit: USD)		
Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1	Assist Member Countries to conduct National survey on marine fisheries research resources survey of SEAFDEC Member Countries	-
Activity 2	Assist Member Countries to build human resources capacity by using M.V. SEAFDEC 2	-
	Follow up Program on the improve Construction of a fisheries research and training Vessel	-

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	A set of scientific data <i>i.e.</i> hydro-acoustic data, fisheries resources, hydrographic/oceanographic data and phytoplankton, zooplankton, fish larvae from the cruise survey.
Activity 2	Competent fisheries researcher and oceanographer to handle the fisheries research resources shipboard survey
	M.V. SEAFDEC has boon improved navigation, communication system, engines, as well as some fishing equipment that enhance better safety and quality for the shipboard and navigation of the marine fisheries survey and shipboard training program.

#### 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activity 1.1												
Activity 2												
Sub-activity 2.1												
Sub-activity 2.2												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

		Project id: 201306002	
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Strengthening SEAFDEC Network for Sustainable Fisheries		
<b>Strategy:</b>	VI	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	Secretariat	<b>Lead Country:</b>	Indonesia
<b>Donor/Sponsor:</b>	JTF6	<b>Total Donor Budget:</b>	USD 399,454
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 52,810
<b>Project Leader:</b>	Dr. Worawit Wanchana, Secretariat	<b>Involved Country:</b>	All ASEAN 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 30<sup>th</sup> 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 particularly Japanese Trust fund projects 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
1.1 Support and strengthen the 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 respective countries.  In this activity, SEAFDEC 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.
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.
2.1 Monitoring and evaluation of SEAFDEC programs/project activities	Aside from the SEAFDEC program committee meeting, SEAFDEC-JTF programs/activities review meeting are conducted to monitor and evaluate the activities whether it is in line with the requirements of Member Countries. 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 evaluate the overall value of an endeavor and supply lessons learned to improve future actions,



Activity	Description
	planning and decision-making. Evaluations commonly seek to determine the efficiency, effectiveness, impact, sustainability and the relevance of the project or organization's objectives.
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 2013-2019

(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
<b>Sub-Total Budget</b>		<b>55,500</b>	<b>56,500</b>	<b>56,000</b>	<b>54,000</b>	<b>54,000</b>	<b>70,644</b>	<b>52,810</b>

## PART II: ACHIEVEMENTS OF 2018 PROJECT IMPLEMENTATION

### 1. Achievements of the project Implementation for the Present Year

The key achievements of the project implementation for the year 2018 are the continued support and capacity building of the 2 RFPN members from Cambodian and Lao PDR by this project (there was no RFPN for Viet Nam to station at the SEAFDEC Secretariat in 2018), enhanced the effective management of the SEAFDEC programs through the development of the database system 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 1.1					
1) 2 Regional Fisheries Policy Network (RFPNs) for Lao PDR and Viet Nam were supported	II	2	-	-	13,974 (On-going)
2) Enhanced 2 RFPN members capacity through participations of ASEAN-SEAFDEC Meetings as follows:	II	2 RFPN members	-	-	-
Gender Analysis in fishery management in coastal communities in Cambodia, Myanmar and Thailand, 6-9 February 2018					
Regional training on Port State Measures Implementation in Southeast Asia, 20-23 February 2018					
Capacity Development Workshop on Gender Analysis in Fisheries Sector, 5-9 March 2018					

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Technical Expert Meeting on Management of Trans-boundary species for the Northern Andaman Sea, 13-14 March 2018					
Technical Experts Meeting on Management of Trans-boundary Species for the Southern Andaman Sea, 4-5 April 2018					
Regional Technical Meeting of fisheries Resources Enhancement in Southeast Asia, 24-26 April 2018					
Workshop on Tropical Anguillid Eel in Southeast Asia, 7-8 June 2018					
Regional Technical Consultation on International Fisheries-related Issues, 20-22 June 2018					
2 <sup>nd</sup> Technical Experts Meeting on Information Compilation of Trans-boundary Species as Scientific basic for National Measures for Southern Andaman Sea, 10-11 July 2018					
2 <sup>nd</sup> Technical Experts Meeting on Management of Trans-boundary Species of Northern Andaman Sea Sub-region, 12-13 July 2018					
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					
Activity 2.1					
1) Developing the SEAFDEC program Database for effective management (improved system cost)	II	-	3	-	On-going (3,000)
2) Monitoring and review implementation of the ASEAN-SEAFDEC Resolution and Plan of Action (in relation to CCRF)	I	-	3	-	On-going (1,000)
Activity 3.1					
1) Publication and Dissemination of the Fish for the People (Vol. 16, I &II)	II	-	-	-	2,836 (On-going)
Total Budget Spent till Aug. 18					
Remaining Budget till end Dec. 18					

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1.1		
1) Regional Fisheries Policy Network (RFPN members) for Cambodia and Lao PDR 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 and Lao PDR (2 persons as RFPN members) were stationed at the SEAFDEC Secretariat. Their 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.
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.  RFPN members' English skills and proficiency were enhanced through the technical writing class (related to fisheries issues) offered by SEAFDEC.  In addition, the Country Profile on Fisheries of 2 countries (Cambodia and Lao PDR) were compiled and presented by those 2 RFPN members) through an assignment given to them.

Planned activity	Expected outcome/output	Achievements
Activity 2.1		
1) 1) Developing the SEAFDEC program Database for effective management (improved system cost)	Strengthened monitoring and evaluation of the SEAFDEC programs and projects	The 1 <sup>st</sup> draft of the SEAFDEC Program Database was developed and tested for further improvement for effective management and support the cost-benefit analysis.
2) Monitoring and review implementation of the ASEAN-SEAFDEC Resolution and Plan of Action (in relation to CCRF)		The country implementation on ASEAN-SEAFDC Resolution and Plan of Action was compiled for further reviews and report.
Activity 3.1		
1) Publication and Dissemination of the Fish for the people	Strengthened the information dissemination of SEAFDEC projects results	2 volumes of Fish for the People (approximately 3,000 copies) were published and disseminated to worldwide institutions related to fisheries (Vol. 16, No. 1 and No. 2, on-going)
2) Publication on Combating IUU Fishing (Ongoing)		<On-going>

#### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
Two (2) volumes of Fish for the People (Vol. 16, No. 1 &2)	Magazine	Cover image

#### 5. Evaluation from Participants of Member Countries

Planned activity	Evaluation/ Views from Member Countries
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.
Activity 1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	Projects and activities of SEAFDEC were evaluated through the FCG/ASSP Meeting conducting annually.
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 3.1: 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

##### 1. Database for SEAFDEC Programs/Activities

To enhance effectiveness of SEAFDEC's projects/activities implementation in collaboration with ASEAN Member States, the database system will be developed and used mainly for its planning, monitoring, and evaluation. In addition, this system would also provide a platform to enhance activities' ownership of the AMSs through the course of information input from the countries.

##### 2. 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: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

		(Unit: USD)
Proposed Activity	Description of Proposed Activity	Proposed Budget
1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	- Continue to 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	32,000
1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	- Continue to 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 - Continue to cooperate with National Fisheries University (NFU) of Japan through the use of KOYO Maru to support AMSs in conducting the fisheries resources survey in the ASEAN Region (Viet Nam for 2017 -2019) Other emerging matter	9,500
2.1 Monitoring and evaluation of SEAFDEC programs/ project activities	- Conduct full operation of the SEAFDEC program database to increase the effectiveness of program management	2,000
3.1 Produce and disseminate SEAFDEC special publications	- Continue to publish and disseminate the Fish for the People, to enhance its visibility to the Member Countries, regional and international arenas	9,310
<b>Total</b>		<b>52,810</b>

#### 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	- 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.
1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	- Strengthened other cooperation with SEAFDEC Partnership
2.1 Monitoring and evaluation of SEAFDEC programs/project activities	- Improved/developed database system for SEAFDEC Program - Improved monitoring and evaluation system
3.1 Produce and disseminate of SEAFDEC special publications	- Published and disseminated 2 volumes of SEAFDEC Publication "Fish For the People" ( 3,000 copies)

#### 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.1 Support and strengthen the Regional Fisheries												

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
Policy Network (RFPN) stationed at SEAFDEC Secretariat												
1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs												
2.1 Monitor and evaluation of SEAFDEC programs/project activities												
3.1 Produce and disseminate SEAFDEC special publications												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

	Project id: 201306003		
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia		
<b>Program:</b>	Special Project	<b>Total Duration:</b>	2013-2019
<b>Lead Department:</b>	SEAFDEC Secretariat	<b>Lead Country:</b>	Indonesia
<b>Donor/Sponsor:</b>	Sida (through the Embassy of Sweden, Bangkok)	<b>Total Donor Budget:</b>	Total budget 48 Millions SEK
<b>Project Partner:</b>	ASEAN, FAO, BOBLME, CTI-CFF, RPOA-IUU, MRC, UNEP, IUCN/MFF, ILO, USAID, UNEP/GEF	<b>Budget for 2019:</b>	8,000,000 SEK (Approx 960,000 USD)
<b>Project Leader:</b>	Ms. Pattaratjit Kaewnuratchadasorn SEAFDEC-Sweden Project Manager	<b>Involved Country:</b>	ASEAN Member States

## **PART I: OVERALL PROJECT DESCRIPTION**

### **1.1 Background and Justification**

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. SEAFDEC in cooperation with the ASEAN (under the ASEAN-SEAFDEC Strategic Partnership (ASSP)) and the ASEAN countries have been implementing regional collaborative programs to clarify regional policies and priorities as well as to support national efforts in addressing habitat and fisheries management and the management of fishing capacity. To cover all relevant aspects (social, governance and aquatic resources/environment), an ecosystems approach have been emphasized throughout the project and this includes management matters, such as (larger) fish resources conservation areas (*e.g.* building upon MPAs, *refugia*, etc), management of fishing capacity and combating IUU Fishing, social mobility and conflicts, etc. 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.

### **1.2 Project Overall Objectives, Outcomes, Outputs, Indicators and Activities**

**Overall Objectives (Outcome 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

<b>Outcome objectives</b>	<b>Outputs objectives</b>	<b>Activity as summarized from RAF indicated areas</b>	<b>Key Performance Indicators (Results Assessment Framework (RAF) targets)</b>
Sustainable use of aquatic resources and reduced vulnerability to climate change by coastal/rural (fishing) communities in the ASEAN Region	1: Capacity built for integration of habitat & fisheries management and adaptation to climate change	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 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.	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)
	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	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

Outcome objectives	Outputs objectives	Activity as summarized from RAF indicated areas	Key Performance Indicators (Results Assessment Framework (RAF) targets)
	<p>3: Capacity built and policy development processes improved for the drafting and implementation of regional &amp; sub-regional agreements</p>	<p>illegal fishing</p> <p>3:1/3.2 Collaboration is maintained and strengthened between SEAFDEC and other regional and international organizations</p> <p>3:3 Capacity increased to build upon national laws and policies Sub-regional and bilateral agreements established and agreed upon</p> <p>3:4 Important international conventions and regional agreements reviewed</p> <p>3:5 Information sharing promoted and facilitated among ASEAN countries on national legislation and institutional arrangements</p> <p>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</p> <p>3:9 The role of SEAFDEC as ASEAN's technical body has been supported, including strengthened in-house capacity</p>	<p>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</p>
	<p>Cross-cutting activities</p>	<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</p> <p>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>



Outcome objectives	Outputs objectives	Activity as summarized from RAF indicated areas	Key Performance Indicators (Results Assessment Framework (RAF) targets)
	4. Project Management and Coordination	4.1 Expenses of Staff, RFPN and administration, 4.2 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) 4.3 Reporting costs, editing and printing 4.4 Project monitoring and coordination, project mid-term review (year 3) and project evaluation (year 5) 4.5 Operating, equipments and maintenance expenses	

*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.*

### 1.3 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). In 2018, the perspective include the establishment of sub-regional agreements or other arrangements of relevance to fisheries and habitat management in the Gulf of Thailand, the Andaman Sea and to support processes for the cooperation among countries in the Sulu-Sulawesi Seas and the Mekong River Region.

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. 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 *Refugia* etc in recognition of steps being taken and impacts achieved.

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.

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.

- **Activity, Sub-activity and Proposed Budget for 2013-2019**

Budgets in the Table 2 show the relative balance between Output Objectives, cross-cutting elements has been divided between the groups. Various activities are implementing different output objectives. Actual need and use of funds will depend on 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 and 2019, the Project will request the disbursement from the Sweden annually 7,000,000 Swedish Kroners (equivalent to 28,000,000 Baht)

Table 2: Budget 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 Jan-Aug 2018)
Output objective1: Capacity built for integration of habitat & fisheries management and adaptation to climate change	Output objective 1 have 4 activity “indicators” (see above) together with annual targets	1,389,694.98	8,571,044.97	12,236,940.85	16,667,958.84	10,544,469.27	2,720,342.64
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	609,585.21
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	2,315,714.93
Cross-cutting issues – see above on RAF structure	In this table the activities included under 1, 2 and 3 above						

(Activity Group) Output Objective	Sub-Activity	2013 (actual expenses)	2014 (actual expenses)	2015 (actual expenses)	2016 (actual expenses)	2017 (actual expenses)	2018 (actual expenses Jan-Aug 2018)
4. Administration, personnel and coordination	1. Expenses of Staff, RFPN and administration 2. Planning meetings, regular coordination meetings (FAO/RAP/AP FIC, 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	12,907,594.53	14,422,775.56	8,528,853.09	7,681,277.11	9,019,017.95	4,871,635.83
<b>Sub-Total (THB)</b>		<b>10,146,556.76</b>	<b>23,696,876.08</b>	<b>26,644,350.15</b>	<b>34,667,309.39</b>	<b>30,613,350.04</b>	<b>10,801,356.37</b>
<b>Overhead charge</b>		<b>3,389,404.32</b>	<b>2,369,687.60</b>	<b>2,664,435.02</b>	<b>3,466,730.94</b>	<b>3,061,335.04</b>	<b>0</b>

Remark: Overhead charge based on actual expenses of each year.

## PART II: ACHIEVEMENT OF 2018 PROJECT IMPLEMENTATION

### 2.1 Achievements of the Project Implementation for the Year 2018

The SEAFDEC-Sweden Project has successfully continued to facilitate consultations between ASEAN Member States at regional, sub-regional and sub-sub-regional levels. The progress is focused on main thematic areas and cross-cutting issues: Neritic Tuna; transboundary species (mackerels and anchovies), fishing Capacity (MCS-network building); gender; small-scale fisheries and contracts with local partners for local capacity building including updates on recent developments. Specific sub-regional focus is given to strengthened cooperation around Gulf of Thailand, Andaman Sea, the Mekong and the Sulu-Sulawesi Seas.

#### 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*)

In the support of the implementation of the RPOA-Neritic Tuna, the activities implemented have gradually been strengthening cooperation among countries at regional and sub-regional level. Progress has been reported annually to SEAFDEC Council, the ASWGF and SOM-AMAF. The Scientific Working Group (SWG), is a group of scientist who play an important role to provide scientific information to ensure a scientific basis and improved assessments on the availability, distribution and migration of neritic tuna for the development of management plans and increased understanding on stock status and migration paths for Neritic Tuna in Southeast Asian waters. The following events were conducted in 2018 including on-going activities to continue:

- The Population Study on *Thunnus Tonggol* in the Southeast Asian region (1 October 2017-30 September 2018): This activity is led by MFRDMD and the Workshop on the preparation of final report was conducted on 8-9 August 2018. The results will be presented at next coming 5<sup>th</sup> SWG-Neritic and the national symposium (Marine Capture Fisheries Symposium, 2-3 Oct 2018 in Penang) and the 8<sup>th</sup> International Fisheries Symposium (IFS), 18-21 November 2018, Hatyai Thailand.
- The progress reported annually at the ASEAN Fisheries Consultative Group and ASWGF in 2018.
- Practical Workshop on Stock Assessments of Indo-Pacific King Mackerel and Narrow-barred Spanish mackerel in the Southeast Asian Waters on 16-20 July 2018 at SEAFDEC/TD in Samut Prakan, Thailand. A total number of participants was 16 persons (13 male and 3 female) attended in this Workshop which was organized with the aim to focus on stock assessment analysis of the Indo-Pacific King mackerel and narrow-barred Spanish mackerel using ASPIC, Kobe plot (stock status trajectory) as a decision making tool for management and other relevant programs. The outputs from this Workshop are the draft stock and risk assessment of Indo-Pacific King Mackerel and Narrow-Barred Spanish Mackerel in Pacific and Indian Ocean sides. The paper is expected to be published in 2019.

Pending the availability of the resource persons, the 5<sup>th</sup> Meeting of the Scientific Working Group on Neritic Tunas will be organized in January 2019.

- **Management of trans-boundary resources/stocks**

***Gulf of Thailand sub-region***

Based on the discussion among the Gulf of Thailand countries, the target species are 1) Anchovies, 2) Mackerels and 3) Blue Swimming Crab (AIB) around the Gulf of Thailand. However, to be able to consider the status of shared and transboundary species and available information, the Project conducted the “Experts Group Meeting on Stock Status and Geographical Distribution of AIB Species in the Gulf of Thailand” was organized in September 2016. A follow-up meeting was conducted to develop the plan for the continued stock study for AIB species was organized in February 2017. After consideration, it was suggested that SEAFDEC should facilitate completion of the information on stock structure of the Indo-Pacific mackerel conducted by Thailand as there was likely insufficient number of samples during the previous study. The SEAFDEC-Sweden Project organized the Inception Meeting for DNA study on stock structure of Indo-Pacific Mackerel in the Gulf of Thailand in December 2017 to finalize the DNA sampling plan in Cambodia, Viet Nam, Malaysia and Thailand. Later on in April 2018, the DNA Sampling conducted in selected sites of Cambodia, Viet Nam, Thailand and Malaysia. The result of DNA analysis will be completed by fourth quarter of 2018. SEAFDEC also plan to organize the scientific meeting in order to disseminate the research result to scientists and management level.

***Andaman Sea sub-region***

In the early 2018, the Project organized two (2) meetings: the 1<sup>st</sup> Technical Experts Meetings on Management of Transboundary Species for Northern Andaman Sea (between Myanmar and Thailand), 13-14 March and for Southern Andaman Sea (among Indonesia, Malaysia and Thailand), 4-5 April 2018, in Bangkok, Thailand, respectively. The main objective of the meetings was to identify available data of each of the countries on anchovies, mackerels and Neritic tunas with regards to their spawning grounds, spawning seasons, other biological data, habitats and migration patterns as well as existing fisheries regulations. The information will be used to produce maps of important features of the life cycle of the priority species covering the Northern and Southern Andaman Sea. These maps would serve as inputs to future coordination of national fisheries measures. In this regard, countries agreed on a list of maps and collected and compiled existing data for anchovies, mackerels and Neritic tunas in collaboration and coordination with other agencies, research institutions and universities. The developed maps would be agreed and discussed in the forthcoming meeting.

The process was followed up and later on in July 2018, the 2<sup>nd</sup> *Technical Experts Meeting on Information Compilation of Transboundary Species as Scientific Basis for National Measures for Southern Andaman Sea*, held on 10-11 July, and the 2<sup>nd</sup> *Technical Experts Meeting on Management of Transboundary Species for Northern Andaman Sea*, held on 12-13 July, 2018 in Chonburi Province, Thailand, respectively. The

Meetings revealed and analyzed information from the digital maps on spawning grounds, spawning seasons, other biological data, habitats and migration patterns as well as existing fisheries regulations on Anchovy, Mackerel and Neritic Tuna. The events were facilitated by SEAFDEC/TD. Based on the maps, the information are not sufficient to make conclusion or agreement. After the discussion, it was agreed to continue for the improvement of the data collection in each countries.

**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

One of the regional and sub-regional challenges is to monitor and control fishing effort and the legal status of fishing operations and catches being landed. This is closely connected to efforts by SEAFDEC in cooperation with partners to combat illegal (IUU) fishing. The Project finalized (with partners) the ASEAN RPOA-Fishing Capacity that is now adopted by ASEAN. Progress in the implementation of management and control of fishing capacity has been promoted through bilateral dialogues and sub-regional consultations conducted in 2018 with a focus on monitoring catches and landings and to raise awareness on procedures and systems for traceability of fisheries products. The main discussions in 2018 have been held on information sharing and the development of simple MCS-networks including control of fish landings across boundaries together with sub-regional implementation of the RPOA-Fishing Capacity.

- Support on the Establishment of Monitoring, Control and Surveillance (MCS) Networks

***Gulf of Thailand sub-region***

In following-up to the recommendation from the 6<sup>th</sup> Meeting of Gulf of Thailand sub-region (2017) that MCS systems should be strengthened among relevant inter-agencies including establishment of sub-regional/bilateral MCS networks, SEAFDEC facilitated the Sub-regional consultation on MCS for Gulf of Thailand in 2017 (31 October-2 November 2017). The Meeting addressed sub-regional cooperation and stressed common priorities with regards to the establishment of MCS Network(s) for improved transboundary fisheries management and control of fishing effort. It was agreed that the development of sub-regional MCS network(s) would be a major force in keeping track of the implementation of fisheries management plans and the legality of fishing efforts. Participating country representatives agreed to communicate and collaborate with responsible agencies to secure mandate and cooperation in order to establish the sub-regional MCS network(s) by linkages of existing national networks.

As a resulted from the Meeting, the SEAFDEC-Sweden Project developed steps to establish a sub-regional MCS body that included 1) National consultations, 2) Sub-regional meetings, and 3) Establishment of Networks. In line with the indicated steps Thailand organized a National consultation in July 2018 and Cambodia organized one in August 2018. Based on results of the national consultations the 2<sup>nd</sup> Sub-regional Consultation on MCS network in the Gulf of Thailand will be organize later in the year or early 2019.

***Andaman Sea sub-region***

In November 2017, SEAFDEC-Sweden project facilitated the discussion among Indonesia, Malaysia, and Thailand as part of the Southern Andaman Sea cooperation with the organization of *the Third Sub-regional Consultative Workshop of the Southern Andaman Sea*. Furthermore, in November 2018 dialogue was facilitated between Thailand and Myanmar as part of the Northern Andaman Sea cooperation with *the Third Sub-regional Consultative Workshop of the Northern Andaman Sea/Myeik Archipelago* in Bangkok, Thailand. Countries requested during both events SEAFDEC to develop work plans for the process and consultations for the establishment of MCS coordination among countries for the Northern and Southern Andaman Sea sub-sub-regions by building upon existing national and bilateral cooperation initiatives. Effective sub-regional coordination could facilitate trade through improved product traceability, coordinate national measures to secure fish resources as well as to improve scientific assessments and simplify surveillance measures. The combined and coordinated initiatives would support national efforts to reduce IUU fishing. A condition for such a cooperation to be successful is that all relevant authorities

involved in various aspects of fisheries management take part in the cooperation both nationally and bilaterally/regionally.

In July 2018, the SEAFDEC-Sweden Project organized the *MCS Sub-regional Cooperation Meeting in Northern Andaman Sea* which was held in Bangkok, Thailand. The national technical persons from Thailand and Myanmar discussed on common concerns and issues to address on cooperation, including information sharing needed as a basis for establishing an MCS network between the two countries. Both countries agreed to collaborate with different agencies respective of their mandates and responsibility and strengthen the cooperation sub-regional MCS network based on existing cooperation.

For the further steps, the SEAFDEC-Sweden Project will organize a similar MCS network meeting for Southern Andaman Sea sub-sub-region (among Indonesia, Malaysia and Thailand) by December 2018. Subsequently, MCS network coordination can be developed to cover the whole area of 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

In 2018, the SEAFDEC-Sweden Project made further progress on trans-boundary and sub-regional cooperation on fisheries and habitat management, including measures to monitor and control fishing effort and landings across boundaries.

In the Gulf of Thailand and Andaman Sea sub-regions, there has been direct implementation of activities under the Project, while activities in the other two sub-regions (Mekong and the Sulu-Sulawesi Seas) have been undertaken mostly in collaboration with partners or by partners with results monitored by SEAFDEC, *e.g.* MRC, USAID/Oceans, etc.

#### ***Gulf of Thailand Sub-region***

As recommended from the 6<sup>th</sup> Meeting of the Gulf of Thailand Sub-region organized in March 2017, the bilateral consultations that have been organized included Thailand-Malaysia in July 2017, Cambodia-Viet Nam in October 2017, Thailand-Viet Nam in June 2018, and Cambodia-Thailand in August 2018, sequentially.

In addition, the 7<sup>th</sup> Meeting of the Gulf of Thailand Sub-region is planned to be organized in November 2018 to discuss and agree on continued and strengthened Gulf of Thailand sub-regional information sharing in support of the management of transboundary fish stocks, the monitoring and management of fishing capacity and to combat illegal fishing as well as to follow-up on progress of initiative to establish MCS networks (by building upon existing national mechanisms).

Moreover, the SEAFDEC-Sweden Project supported the establishment of the Scientific Working Group on Stock Assessment on Neritic Tuna that have achieved improved stock assessment of Longtail tuna and Kawakawa in the Southeast Asia waters. The assessments have been ongoing since 2016 and the initiative is endorsed by ASEAN Member Countries. Further advancement has been made in 2018 and SEAFDEC has also supported the implementation of “Gulf of Thailand Tonggol Tuna Fishery Improvement Project”. The Joint Declaration between the Department of Fisheries (Thailand), SEAFDEC, World Wide Fund for Nature (WWF-Thailand) and the Thai Tuna Industries Association (TTIA) was signed on 29 May 2018. The initiative is a stepwise approach to create measurable changes and ensure the long-term sustainability of Tonggol tuna fisheries.

#### ***Andaman Sea Sub-region***

With reference to the signed MOU on Fisheries Cooperation between Thailand and Myanmar in the Northern Andaman Sea sub-sub-region, the Project have successfully facilitated the discussion between the two countries on several areas of mutual interest including aspects on management of trans-boundary

stocks, combating IUU fishing and specifically on the establishment of sub-regional MCS coordination efforts.

In parallel, the Project also facilitated the dialogues for the countries around Southern Andaman Sea sub-sub-region (Indonesia, Malaysia and Thailand) by the conduct of the Meetings for the compilation of available information to form the basis for digitized maps of spawning grounds, nursery grounds, migration patterns and fishing areas of Anchovies, Mackerels and Neritic Tuna in the Southern Andaman. The Project also facilitated the consultation on the MCS networking in the Southern Andaman (on-going).

The Project is also planning to organize the 4<sup>th</sup> Meeting of the Andaman Sea sub-region in November 2018.

### ***Mekong River Basin Sub-region***

The main emphasis during 2018 has been to continue to monitor developments in Mekong fisheries and progress achieved through partners such as the MRC and the WorldFish Center in Phnom Penh (a consultation was held in May 2018). Work on fisheries implemented by the MRC has been primarily focused on efforts to develop a project in support of the Basin Wide Fisheries Strategy. Other areas in focus have been two bilateral initiatives: one in the Champasak (Lao PDR)-Stung Treng (Cambodia) area and here the Project has been monitoring the wrapping up of a World Bank/MRC IWRM Project (no further activities planned by the Project). While the other area is located around Chiang Rai (Thailand) – Bokeo (Lao PDR) where the basis for bilateral cooperation is a MOU signed between Lao PDR and Thailand to strengthen fisheries cooperation and earlier works was done MRC in this area that could be used as reference. In line with the MOU between the two countries, SEAFDEC-Sweden Project has conducted recent fishing gears surveys in Bo Keo of Lao PDR and Chiang Rai of Thailand. The results will be discussed and provided as information for the development of bilateral management plans of fisheries resources in this area at the Bilateral Technical Meeting on Effective Fisheries Management between Lao PDR and Thailand in Chiang Rai Province during 29-30 October 2018. The meeting could promote cooperation between the two countries on the monitoring and control of fishing in the area. The aim would be to balance the use of available resources with the need for protection of critical habitats. The event is also expected to provide directions for strengthening transboundary resource management and conservation including monitoring and control of fishing efforts with reference to the fishing gear surveys and availability of resources in Bo Keo (Lao PDR)-Chiang Rai (Thailand) area.

As in other areas, the SEAFDEC-Sweden Project have also promoted the concept of an Ecosystem Approach to Fisheries Management (EAFM) through the integration of habitat and fisheries management by provided the training course for Lao PDR officers (Bo Keo) in December 2017. The concept could be basis knowledge for jointly efforts among relevant agencies to work towards the sustainability of fisheries and the conservation of important habitats.

### ***Sulu-Sulawesi Seas***

With regards to the Sulu-Sulawesi Seas, SEAFDEC has also during 2018 continued to mainly focus on the monitoring of experiences to be drawn from initiatives supported through the CTI-CFF and by the USAID Oceans and Fisheries Partnership. Regularly meetings are held with USAID Oceans for updates on progress and activities planned.

- **Gender and Social Development**

In 2018, the SEAFDEC-Sweden Project made good progress on the integration of gender aspects in project implementation and continued support to staff capacity building at SEAFDEC together with the incorporation of gender reviews in promoted research activities:

*The collaboration with IUCN/SEI/SEAFDEC-Sweden on Regional Gender Study, in collaboration with Mangrove for the Future and SEI at site levels (2017-2018)*

This collaboration comprise two (2) Phases namely: Phase I: Literature review of regional gender study (completed) and Gender Analysis at Kep (Cambodia), Trat (Thailand) and Kaw Thauung (Myanmar) (completed) and Phase II: Regional synthesis (to be completed by November 2018). In addition, the results of Gender Analysis from selected sites were presented at the national forum in Thailand (June

2018) and at the Gender in Aquaculture and Fisheries (GAF7) Conference at Asian Institute of Thailand in October 2018 and the 3<sup>rd</sup> World Small-Scale Fisheries Congress in Chiang Mai in October 2018. From the jointly conducted work, SEAFDEC staff and fisheries officers of Cambodia, Thailand and Myanmar gained a lot of knowledge on the data collection on Gender Analysis and interpretation of the research results to summarize gender perspectives in a given area.

#### *Development of Gender Toolkit*

The SEAFDEC-Sweden Project organized the Experts Consultation Workshop on Guidance to Monitoring and Evaluation of Gender Equity and Social Well-being in Fisheries Communities (8-10 August 2018) in Bangkok. In collaboration with participating regional partners a draft Gender Toolkit was discussed and developed that would assist researchers by having a Toolkit as Guidance to Monitoring and Evaluation of Gender Equity and Social Well-being in Fisheries Communities

#### *Development of Gender Strategy*

To support the integration of gender perspectives in fisheries within SEAFDEC and its Member Countries, SEAFDEC Council proposed during the 50<sup>th</sup> Meeting of the SEAFDEC Council in March 2018, in Siem Reap, Cambodia to develop a “SEAFDEC Gender Strategy.” It is envisaged that the SEAFDEC Gender Strategy 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. In line with the policy directives given by the Council, SEAFDEC by the Gender Working Team comprising members from SEAFDEC Secretariat and Training Department (TD), and in consultation with the SEAFDEC Gender Focal Persons from the other Departments, namely AQD, MFRDMD and IFRDMD, therefore convened an “Inter-Departmental Meeting on Development of SEAFDEC Gender Strategy” on 3-4 September 2018 in Bangkok, Thailand, and came up with the first draft of the SEAFDEC Gender Strategy. It is envisaged that this first draft SEAFDEC Gender Strategy, incorporating views and comments from the SEAFDEC Program Committee at its 41<sup>st</sup> Meeting, would be further submitted to the 51<sup>st</sup> Meeting of the SEAFDEC Council for consideration.

- Enhancing Coordination within ASEAN Countries through the Regional Fisheries Policy Network (RFPN)

Under the present arrangements, in 2018, 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 and Lao PDR. 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).

The Project coordinates closely with Mangroves for the Future (MFF)/IUCN in many aspects, such as transboundary areas management around Gulf of Thailand as well as the on-going study on the Regional Gender Study with MFF/SEAFDEC/SEI (2017-2018) Phase I-PhaseII.

On “Small Scale Fisheries” and Gender aspects, the Project coordinated with FAO/Rome, FAO/RAP, Too Big to Ignore (TBTI), AIT, MRC, ICSF. On “Labor aspects” the Project coordinated with the International Labour Organization (ILO) as well as a range of national partners.

### **Support to local capacity-building**

In 2018, SEAFDEC has continued support local organization to implement the activities entitle “Toward as Ecosystem-base Approach to Fisheries Management in Trat Bay” through the Sustainable Development Foundation from period of July 2017-June2018, key achievements included capacities built for small scale fishing communities on improved behavior to engage in fisheries management and marine coastal resources conservation, support to establish the Small-Scale Fisher Association of Trat province and promote the implementation of coastal resources conservation zones.

Furthermore, SEAFDEC plans to organize the National forum to disseminate the best practices and lessons learnt from coastal communities of Cambodia through activities implemented by CORIN-Asia Cambodia and Learning Institute. The Forum will be held in December 2018.

## **2.2 Activities Conducted 2018 within the framework of the Current Project**

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					
1 <sup>st</sup> Technical Experts Meeting on Management of Transboundary Species for the Northern Andaman Sea Sub-region, 13-14 March 2018	R	5	18	0	
1 <sup>st</sup> Technical Experts Meeting on Management of Transboundary Species for the Southern Andaman Sea Sub-region, 4-5 April 2018	R	9	18	0	
2 <sup>nd</sup> Technical Experts Meeting on Information Compilation of Transboundary Species as Scientific basis for National Measures for Southern Andaman Sea Sub-region, 10-11 July 2018	R	6	15	2	
2 <sup>nd</sup> Technical Experts Meeting on Management of Transboundary Species for the Northern Andaman Sea Sub-region, 12-13 July 2018	R	5	15	2	
Practical Workshop on Stock Assessments of Indo-Pacific King Mackerel and Narrow-barred Spanish Mackerel in the Southeast Asian Waters, 16-20 July 2018, SEAFDEC/TD, Samut Prakan, Thailand	T	5	7	1 (Resource person)	

Output objective 2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)					
Fishing Gear Survey in Bo Keo, Lao PDR, 4-11 February 2018	R				
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	P	10	17	0	
Fishing Gear Survey in Chiang Rai, Thailand, 20-24 August 2018	R				
Output objective 3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements					
Bilateral Technical Meeting on Effective Fisheries Management between Thailand and Viet Nam, 12-13 June 2018, Da Nang, Viet Nam	P	10	8	0	
Experts Consultation Workshop on Guidance to Monitoring and Evaluation of Gender Equity and Social Well-being in Fisheries Communities, which was held on 8-10 August 2018, Bangkok	P	8	12	10	
2 <sup>nd</sup> Sub-regional Technical Meeting on Effective Fisheries Management between Cambodia and Thailand, 29-30 August 2018, Koh Kong, Cambodia	P	20	8	3	
Bilateral Technical Meeting on Effective Fisheries Management between Lao PDR and Thailand, 29-30 October 2018, Chaing Rai	P	20	10	0	
Activity: Participation in the non-SEAFDEC-Sweden events and policy forum					
The Meeting on Drafting of the Fisheries Management Plan for Blue Swimming Crab, Phetchaburi, 5-6 February 2018	O		2		
Regional Technical Seminar Joining Forces in Fisheries Sector Promoting Safety, Decent Work, Fight against IUU fishing, 21-22 March 2018, Manila, Philippines	O		1		
Regional Cooperation Against Human Trafficking, Labor, 27-28 March 2018, Indonesia	O		1		
The 50 <sup>th</sup> Meeting of the SEAFDEC Council, 26-30 March 2018, Siem Reap, Cambodia	O		2		
The 10 <sup>th</sup> Meeting of the ASEAN Fisheries consultative Forum (AFCF), 7 May 2018, Thailand	O		2		
6 <sup>th</sup> Marine Science Conference, Chonburi, Thailand	O		4		
Gender in Aquaculture and Fisheries Conference (GAF7), 18-21 Oct 2018, AIT	O		1		
3 <sup>rd</sup> World Small-Scale Fisheries Congress, 22-26 October 2018,	O		3		

Chiang Mai, Thailand					
41 <sup>st</sup> Meeting of SEAFDEC Program Committee, 5-7 November 2018, Langkawi, Malaysia	O		1		
21 <sup>st</sup> Meeting of ASEAN-SEAFDEC Fisheries Consultative Group, 8-9 November 2018, Langkawi, Malaysia	O		1		

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

Below, the propose activities are just provided for information. The details of the draft Annual Workplan for 2019 will be submitted to the Swedish Embassy for approval by 30 November 2018

Project/Activity Title	Duration	Remarks
To address the components above, expected events to be carried out in 2019:		
1. Conduct the activities sub-regional meetings, Consultation and workshop, etc based on the thematic tissues	Jan-Dec	
2. Wrap-up on lesson learned on Three (3) Outputs objectives based on Four (4) sub-regions (Gulf of Thailand, Andaman Sea, Mekong River, and Sulu-Sulawesi Sea)	Jan-Dec	
3. Regional Cooperation to Promote Sustainable Utilization of Neritic Tuna Resources in Southeast Asia Waters	Jan-Dec	
3.1 5 <sup>th</sup> Meeting of the Scientific Working Group Meeting on Neritic tuna meeting		
3.2 Improve data collection for Neritic Tuna		
4. Active participation envisaged by the project to regional and international events organized by ASEAN, FAO/APFIC, Sida, CTI-CFF, USAID, IUCN/MFF, ILO, UNEP, MRC, RPOA-IUU, BOBLME, SEAFDEC, SwAM, SEAFDEC/ Japanese Trust Fund (JTF), and others.	Jan-Dec	
5. Strengthening the capacity of young fisheries officers with a variety of specializations and skills have been dispatched from the Member Countries through the SEAFDEC Regional Fisheries Policy Network (RFPN). (The SEAFDEC-Sweden collaborative project as well as by the SEAFDEC/JTF provide financial support to 8 Member countries).	Jan-Dec	
<i>Note: Aspects of climate change, gender will be integrated in all outputs groups as a cross-cutting matter to be considered.</i>		

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2018  
AND  
PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201506004
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	The Oceans and Fisheries Partnership (USAID Oceans)		
<b>Program:</b>	Special Project	<b>Total Duration:</b>	May 2015 - May 2020
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	U.S. Agency for International Development (USAID Oceans)	<b>Total Donor Budget:</b>	USD 19,953,018
<b>Project Partner:</b>	USAID, SEAFDEC, CTI-CFF	<b>Budget for 2019:</b>	USD 4,817,355*
<b>Project Leader:</b>	John Parks	<b>Involved Country:</b>	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, working 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; Expansion Country eCDT system development, implementation supported through limited, strategically-targeted technical assistance; support provided for implementation and expansion of the SEAFDEC eACDS.
- **EAFM** – Sulu-Sulawesi Seascape Sub-Regional EAFM Plan adopted; Learning Site EAFM Plans adopted; 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 CDTS 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 SFM 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	Outcome 3: Regional and national organizations engaged in and capable of using eCDT for enhanced sustainable fisheries	Output 3: SFMPs developed, adopted, and implemented in priority biodiversity areas	

Objective	Outcomes	Outputs	Activities
EAFM	management		
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 I (Thailand and Malaysia) and II (ASEAN and CTI) countries. USAID Oceans will work with local counterparts to support eCDT planning, sustainable fisheries management and human welfare interventions.

### 3.3 Activity, Sub-activity and Proposed Budget

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	802,892	426,264
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	1,605,785	852,528
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	1,605,785	852,528

Activity	Sub-Activity	Y1 2016	Y2 2017	Y3 2018	Y4 2019	Y5 2020
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	802,892	426,264
<b>TOTAL</b>		<b>3,835,697</b>	<b>4,577,642</b>	<b>4,164,739</b>	<b>4,817,355</b>	<b>2,557,585</b>

\*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: ACHIEVEMENT OF 2018 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 Third Annual Technical Working Group Workshop and to hold a SEAFDEC and CTI-CFF Member Country Learning Exchange in the Bitung, Indonesia Learning Site.
- 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 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 two CDT thought leadership publications, the Data Requirements for Catch Documentation and Traceability in Southeast Asia: Critical Tracking Event and Key Data Element Framework and Glossary, or the “KDE Manual” for short, and Fisheries Catch Documentation and Traceability in Southeast Asia: Technical Specifications, or the “CDT 201,” which provides guidance on USAID Oceans’ approach to system design, development and technical specifications—as well as the key data elements required for full end-to-end traceability.
- 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).
- 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.

*Objective 3: Develop and strengthen human and institutional capacity of regional organizations to conserve marine biodiversity through an EAFM*

- Finalized draft of Sub-Regional Sulu-Sulawesi Seascape Sustainable Fisheries Management Plan and continued efforts to secure endorsement through extensive coordination with CTI-CFF and finalization/socialization workshops.
- Progressed learning site Sustainable Fisheries Management Plans adoption through ongoing socialization and support for capacity building.

*Objective 4: Address and strengthen capacity for human welfare, including gender and labor across all program activities*

- Engaged a Grants Evaluation Committee to evaluate grantee applications received from Philippine and Indonesian organizations; selected the National Network on Women in Fisheries and Perkumpulan KELOLA as the program’s learning site grantees for implementation of Human Welfare and Gender interventions.



- 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.
- Publicly announced partnership 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.
- 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 FY18, USAID Oceans conducted the following training activities:

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1: Regional					
Sub-activity 1.1: Third TWG Planning Workshop	T	57			
Sub-activity 1.2: Workshop for the Finalization of Sulu-Sulawesi Seascape Sub-region EAFM Plan	T	16			
Sub-activity 1.3: e-CDT learning exchange and ASEAN Tuna Ecolabelling Consultative Workshop	T	21			
Activity 2 - Philippines					
Sub-activity 2.1- EAFM Planning Workshop for Crafting the Sarangani Bay and Sulawesi Sea Fisheries Management Plan with the Technical Working Group and Stakeholders	T	25			
Sub-activity 2.2 - BFAR eCDTS Development workshop	T	82			
Sub-activity 2.3 - Seafood Watch Standard and Methodology workshop	T	35			
Sub-activity 2.4 - Workshop for the Use of FAME Technology and Simplified Catch Report	T	60			
Activity 3: Indonesia					
Sub-activity 3.1 - Formulation of Management Measures and Quantitative References to Develop Harvest Strategy for Fisheries in the FMA 716	T	17			
Sub-activity 3.2 - Seafood Watch Standard and Methodology workshop	T	39			
Activity 4: Expansion					
Sub-activity 4.1 - Validation Meeting eCDTS in Viet Nam	T	30			

### 3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
<b>Activity 1: Regional</b>		
Sub-activity 1.1: Third TWG Planning Workshop	Enhanced coordination, capacity, work plan development	Inputs received from TWG members on regional priorities; Increased capacity and coordination for Year 4 Work Plan
Sub-activity 1.2: Workshop for the Finalization of Sulu-Sulawesi Seascape Sub-region EAFM Plan	Regional EAFM Plan, Enhanced Capacity	Finalization and socialization of draft Regional Sustainable Fisheries Management Plan
Sub-activity 1.3: e-CDT learning exchange and ASEAN Tuna Ecolabelling Consultative Workshop	Enhanced capacity for eCDT	Learning site lessons learned shared with regional partners; capacity increased on eCDT development and implementation
<b>Activity 2: Philippines</b>		
Sub-activity 2.1: EAFM Planning Workshop for Crafting the Sarangani Bay and Sulawesi Sea Fisheries Management Plan with the Technical Working Group and Stakeholders	Sustainable Fisheries Management	Furthered development of learning site Sustainable Fisheries Management Plan
Sub-activity 2.2: BFAR eCDTS Development workshop	Enhanced capacity for eCDT	Capacity increased on eCDT development and implementation
Sub-activity 2.3: Seafood Watch Standard and Methodology workshop	Capacity building, Sustainable Fisheries Management	Engaged stakeholders; built capacity and understanding of importance of data-drive sustainable fisheries management
Sub-activity 2.4: Workshop for the Use of FAME Technology and Simplified Catch Report	Capacity building for eCDT implementation	Capacity increased on eCDT development and implementation
<b>Activity 3: Indonesia</b>		
Sub-activity 3.1: Formulation of Management Measures and Quantitative References to Develop Harvest Strategy for Fisheries in the FMA 716	Sustainable Fisheries Management	Furthered development of learning site Sustainable Fisheries Management Plan
Sub-activity 3.2: Seafood Watch Standard and Methodology workshop	Capacity building, Sustainable Fisheries Management	Engaged stakeholders; built capacity and understanding of importance of data-drive sustainable fisheries management
<b>Activity 4: Expansion</b>		
Sub-activity 4.1: Validation Meeting eCDTS in Viet Nam	Stakeholder Engagement, CDT Development and EAFM Planning	Engaged stakeholders, furthered development of eCDT planning

### 4. List of Completed Publications and Others

List of completed publications for the year 2018	Type of media	Attached e-file
1. Overview of the Sulu-Sulawesi Seascape Sub-Regional Plan: Taking an Ecosystem Approach to Fisheries Management	Factsheets	Link

List of completed publications for the year 2018	Type of media	Attached e-file
2. USAID Oceans' Mid-Term Review Report	Reports and Studies	Link
3. Thai Union eCDT and Crew Communications Pilot: Assessment Report	Reports and Studies	Link
4. Making Waves: Issue 3	eNewsletters	Link
5. Workstream Factsheets (English/Bahasa/Tagalog/Thai): CDT, PPP, EAFM, Human Welfare	Factsheets	USAID Oceans Factsheet: English/ Thai/ Tagalog/ Bahasa CDT: English PPP: English/ Bahasa EAFM: English/ Human Welfare: English/ Bahasa
6. Quick Reference KDE Guide	Guidelines	Link
7. Indonesia Stakeholder Validation Workshop Proceedings	Reports and Studies	Link
8. Indonesia Value Chain Assessment: Key Data Elements Gaps Analysis	Reports and Studies	Link
9. Fisheries Catch Documentation and Traceability in Southeast Asia: Technical Concept and Specifications (CDT 201)	Reports and Studies	Link
10. Data Requirements for Catch Documentation and Traceability in Southeast Asia	Reports and Studies	Link
11. Workshop Report: Regional Gender Strategies Implementation Workshop	Reports and Studies	Link
12. Workshop Report: Southeast Asia Fisheries Management Planning Workshop	Reports and Studies	Link
13. 2nd Annual Regional Technical Working Group Planning Workshop	Reports and Studies	Link

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1: 3 <sup>rd</sup> Annual TWG Meeting and Planning Workshop	Evaluations scored positively, with average ratings scored at over 4 points (where 1 equals strongly disagree and 5 equals strongly agree) that the training met expectations, provided valuable skills and materials, and was an environment that encouraged open participation.

## 6. 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.*

USAID Oceans did not experience any major issues during the reporting period that impacted the achievement of project targets or plans. The project did experience some longer than anticipated timeframes for learning site implementation, wherein each link of the learning site eCDT systems must still be connected in FY19 to demonstrate *full, end-to-end* traceability. While this delayed the program from demonstrating end-to-end traceability in FY18, it provided valuable lessons to the program that are useful to Expansion Site partners who are beginning to develop and implement eCDT systems. USAID Oceans was pleased to continue providing support to the eACDS and considered FY18 a successful year for growing, demonstrated interest and demand for the scheme by ASEAN Member States.

USAID Oceans also continued to encounter some challenges resulting from USAID funding restrictions for some of the ASEAN member states due to their developed or advanced developing country status and associated approval requirements. Over the course of the year, the Activity was able to navigate this

challenge through the active USAID DOI grant to SEAFDEC and CTI-CFF. The project is grateful for the support of SEAFDEC and its donors as well as Member Countries for their flexibility and assistance to address this challenge.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2019

#### 1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2019

		(Unit: USD)
Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1: Regional Support and Engagement		\$802,892
Sub-activity 1.1: Support Regional Capacity Building and Coordination	<ul style="list-style-type: none"> <li>- Provide capacity building support to Regional Partner Organizations (SEAFDEC; CTI-CFF) via short-term technical assistance</li> <li>- Develop technical addendum to existing ACDS Regional Guidelines in coordination with SEAFDEC, including development support for national government roadmap to implement regional guidelines</li> </ul>	
Sub-activity 1.2: Develop and Implement a Regional PPP and Industry Engagement Strategy	<ul style="list-style-type: none"> <li>- Maintain partnership with Inmarsat (satellite service provider) to test and pilot mobile satellite solution for data capture at sea</li> <li>- Support Seafood Watch and its partner network on Seafood Technology Workshop, distribution of USAID Oceans communications products, and in engaging buyers in the US and EU markets to support eCDT expansion</li> <li>- Provide technical guidance for regional Seafood and Fisheries Emerging Technologies Conference (with WWF)</li> <li>- Partner with Marine Stewardship Council, Indonesian Coastal Tuna Sustainability Alliance (ICTSA), and private sector companies to align and strengthen the coordination of regional seafood CDT efforts</li> <li>- Form partnership to design and test blockchain-based design for eCDT data exchange</li> </ul>	
Sub-activity 1.3: Build Regional Capacity for CDT	<ul style="list-style-type: none"> <li>- Conduct regional workshop for blockchain-based design of eCDTS data exchange</li> <li>- Provide technology support (software development/coding; hardware) to support eACDS implementation in expansion countries</li> <li>- Provide technical support to SEAFDEC on rollout, testing, and implementation of eACDS with interested expansion countries</li> <li>- Partner and support Global Dialogue for Seafood Traceability in the development and testing of eCDT system architectures and standardized KDEs</li> <li>- Conduct research on KDE collection, exchange, verification, and privacy processes and effectiveness within regional eCDT systems, including the business Return on Investment</li> <li>- Conduct regional Business Innovation Competition to strengthen start-up private sector capacity to provide regional eCDT solutions/services</li> </ul>	
Sub-activity 1.4: Support Development of Regional Fisheries Management Plan(s)	<ul style="list-style-type: none"> <li>- Socialize Sulu-Sulawesi Seas Sub-regional EAFM Plan in preparation of CTI SOM-14</li> <li>- Support SEAFDEC on advancing sub-regional EAFM planning efforts with interested Member Countries</li> </ul>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
Sub-activity 1.5: Integrate Fair Labor and Gender Equity Considerations at the Regional Level	<ul style="list-style-type: none"> <li>- Support, participate in the 7th Global Symposium on Gender in Aquaculture and Fisheries (GAF7)</li> <li>- Coordinate with SEAFDEC on regional capacity building and policy development, including via regional workshops and training events</li> <li>- Support the coordination and capacity building of CTI-CFF's Women Leaders' Forum (WLF) in learning sites and CT6 countries</li> </ul>	
Sub-activity 1.6: Implement Regional Communication Strategy	<ul style="list-style-type: none"> <li>- Manage and update USAID Oceans' Technical Working Group Facebook Group</li> <li>- Create event and exhibit materials for high-profile events</li> <li>- Manage and update USAID Oceans project website (hosted by SEAFDEC)</li> <li>- Develop quarterly e-newsletter to project stakeholders; disseminate</li> <li>- Develop and/or update project informational materials (e.g., fact sheets, infographics, case studies, success stories) regularly; disseminate</li> <li>- Develop multimedia project informational materials (videos)</li> <li>- Support SEAFDEC external communications activities via procurement of external communications-related goods and services</li> <li>- Develop and publish news articles on project impact</li> <li>- Create Workstream Knowledge and Capstone Communications Products; disseminate</li> </ul>	
Activity 2: Support to the Philippines and Learning Site of General Santos City		\$1,605,785
Sub-activity 2.1: Integrated Support for National and Local Activities	<ul style="list-style-type: none"> <li>- Conduct Philippines TWG Meetings to share lessons learned and best practices</li> <li>- Conduct training-of-trainers for national eCDT implementation; consistent with regional guidance; to support national roadmap design</li> <li>- Support the crafting of the interagency Joint Administrative Order in support of provincial and local government eCDT implementation</li> <li>- Develop national and site-level informational materials (e.g., fact sheets, infographics, case studies, success stories); disseminate nationally/locally</li> <li>- Support relevant local stakeholders (e.g., Association of Tuna Handliners) on implementation of municipal/small-scale eCDT systems</li> <li>- Support sharing of project legacy products, learning site experiences, and lessons learned with Philippines TWG members and relevant national and local stakeholders at the 21st National Tuna Congress</li> </ul>	
Sub-activity 2.2: Support and Develop Partnerships to Strengthen National and Local Impact	<ul style="list-style-type: none"> <li>- Conduct partnership training with government (BFAR National and Region 12) and local industry partner (via SFFAII) representatives</li> <li>- Develop and maintain partnership with SFFAII to support the demonstration and expansion of eCDT system</li> <li>- Develop a partnership to support eCDT expansion and fisheries data collection through sustainable business or investment models</li> <li>- Develop a partnership with a small-scale fisheries association (other than SFFAII) to legitimize supply</li> </ul>	

<b>Proposed Activity</b>	<b>Description of Proposed Activity</b>	<b>Proposed Budget</b>
	<p>from small-scale suppliers</p> <ul style="list-style-type: none"> <li>- Collaborate with BFAR on the implementation of eCDT systems for municipal fishers within tuna conservation management zones (TCMZ)</li> <li>- Convene national roundtable discussion regarding emerging role of private sector eCDT solutions and services available to government</li> <li>- Create partnership to grow availability of private sector eCDT solutions/services in support of Business Innovation Competition</li> </ul>	
<p>Sub-activity 2.3: Strengthen Capacity for CDT/Develop and Implement CDTS</p>	<ul style="list-style-type: none"> <li>- Conduct rapid value chain assessment in General Santos City to identify private fisheries industry priorities and gaps on the implementation of an eCDT system</li> <li>- Conduct CDT gap analysis to identify private fishing industry stakeholder priorities and gaps relating to the design and testing of an eCDT system in General Santos City (GenSan)</li> <li>- Partner with Philippines BFAR to support the development of a national eCDT system with relevant administrative and policy support</li> <li>- Localize and test mobile hardware and eCDT software solutions from vessel point-of-capture through export within fisheries supply chains</li> <li>- Support eCDT testing in GenSan through airtime subsidies for at-sea and land-based two-way communications</li> <li>- Socialization and training of FAME eCDT solutions for municipal/small-scale fishers across participating GenSan local government units (LGUs)</li> <li>- Support the modification of internal traceability systems with GenSan partners and for national eCDT system use via BFAR</li> <li>- Provide technological support for national and local eCDT data exchange and use within BFAR Fisheries Operation Centers</li> <li>- Partner with Philippines BFAR to support the socialization of national eCDT system with relevant stakeholders in GenSan and other regions</li> </ul>	
<p>Sub-activity 2.4: Develop Fisheries Management Plan</p>	<ul style="list-style-type: none"> <li>- Socialize Sustainable Fisheries Management Plan (SFMP) for Sarangani Bay Protected Seascape in consultation with National BFAR and BFAR Region 12 Offices</li> <li>- Monitor Sarangani Bay SFMP implementation</li> <li>- Demonstrate use of eCDT data to improve fisheries management decision making and strengthen fish stock assessment efforts</li> <li>- Consult with stakeholders and conduct training on the use of eCDT data for improved fisheries management decision making</li> </ul>	
<p>Sub-activity 2.5: Integrate Fair Labor and Gender Equity Considerations</p>	<ul style="list-style-type: none"> <li>- Conduct capacity building and training on relevant topics (gender sensitivity training, health and safety, financial management, alternative livelihoods) to raise awareness and strengthen the role of women in national and local fisheries management</li> <li>- Implement gender interventions through a grant on “Raising Awareness of Gender Equity and Women Empowerment in Fisheries Management in General</li> </ul>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	Santos and Sarangani Bay Area, Philippines” - Conduct trainings on relevant human welfare issues to raise awareness and address human welfare needs in national and local fisheries	
<b>Activity 3: Support to Indonesia and Learning Site of Bitung</b>		<b>\$1,605,785</b>
<b>Sub-activity 3.1: Integrated Support for National and Local Activities</b>	<ul style="list-style-type: none"> <li>- Conduct Indonesia TWG Meetings to share lessons learned and best practices</li> <li>- Conduct training-of-trainers for national eCDT implementation; consistent with regional guidance; to support national roadmap design</li> <li>- Facilitate Alliance meetings with the Indonesia TWG</li> <li>- Quarterly meetings with Indonesia TWG nationally and locally to report on project activities and progress</li> <li>- Coordination meetings with MMAF and relevant national stakeholders related to workstream activities</li> <li>- Coordination meetings with Bitung/Manado government and other local stakeholders to maintain communications and collaboration</li> <li>- Develop national and site-level communications materials to support workstream activities</li> </ul>	
<b>Sub-activity 3.2: Support and Develop Partnerships to Strengthen National and Local Impact</b>	<ul style="list-style-type: none"> <li>- Develop partnership with ICTSA to support eCDT system demonstration and expansion, sustainable fisheries management and human welfare in Indonesia pole-and-line and handline tuna fisheries</li> <li>- Maintain partnerships with MDPI and first mover companies to strengthen collection of eCDT data and conduct analyses to strengthen fisheries management and understand cost/benefit impacts</li> <li>- Conduct external communications and outreach at national and local levels to share eCDT benefits and lessons, including involvement in relevant events and activities to increase stakeholder awareness</li> <li>- Conduct fisheries stakeholder mapping to show important aspects of fisheries and USAID Oceans’ contribution</li> <li>- Develop partnership with commercially available traceability system to improve its interoperability and capacity of potential early adopter companies on the implementation of complete eCDT system</li> <li>- Support and coordinate with MMAF on the private sectors including technology providers participation in the development, testing, and implementation of national-level downstream traceability (STELINA)</li> <li>- Create partnership to cultivate availability of private sector eCDT solutions/services in support of Business Innovation Competition</li> </ul>	
<b>Sub-activity 3.3: Strengthen Capacity for CDT/Develop and Implement CDTS</b>	<ul style="list-style-type: none"> <li>- Localize and test eCDT hardware and software solutions from vessel point-of-capture through export within fisheries supply chains</li> <li>- Support eCDT testing in Bitung through airtime subsidies for at-sea and land-based two-way VMS via Inmarsat partnership</li> <li>- Support the inclusiveness small-scale fishers in the use of eCDT through technology adoption, training, and socialization for scaling</li> <li>- Support MMAF’s development, testing, and</li> </ul>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	implementation of downstream traceability (STELINA) under national eCDT system <ul style="list-style-type: none"> <li>- Provide technological support for national and local eCDT data exchange and use within MMAF Fisheries Operation Centers</li> <li>- Partner with MMAF to support the socialization of national STELINA with relevant stakeholders in Bitung/Manado and other regions</li> </ul>	
Sub-activity 3.4: Develop Fisheries Management Plan	<ul style="list-style-type: none"> <li>- Socialize and finalize, support regulatory implementation, and monitor proposed SFMP draft for WPP 716 in consultation with MMAF and Provincial Government Offices</li> <li>- Demonstrate use of eCDT data to improve fisheries management decision making and strengthen fish stock assessment efforts</li> <li>- Consult with stakeholders and conduct training on the use of eCDT data for improved fisheries management decision making</li> </ul>	
Sub-activity 3.5: Integrate Fair Labor and Gender Equity Considerations	<ul style="list-style-type: none"> <li>- Implement gender interventions through a grant on "Raising Awareness of Gender Equity and Women Empowerment in Fisheries Management in Bitung, North Sulawesi, Indonesia"</li> <li>- Conduct trainings on relevant human welfare issues to raise awareness and address human welfare needs in national and local fisheries</li> <li>- Hand-over of USAID Oceans Human Welfare and Gender Study to appropriate actors (Indonesia-based organization/institution)</li> </ul>	
<b>Activity 4: Support to Expansion I and II Sites</b>		<b>\$802,892</b>
Sub-activity 4.1: Support Expansion I Sites	<ul style="list-style-type: none"> <li>- SEAFDEC support provided to TWG reps from expansion countries to national/site level training and workshops</li> <li>- Test application of "Trafiz" eCDT software in Thailand to enhance national eCDT system and provide technical assistance</li> <li>- Conduct Malaysia validation workshop to support eACDS implementation roadmap development &amp; provide technical assistance</li> <li>- Provide software, training, and documentation on data exchange server functionality to SEAFDEC for eACDS</li> <li>- In partnership with CTIP, support activities relating to the assessment of technology for connectivity at sea by providing expertise, high-level recommendations and facilitating connections to the relevant technology companies in the fishing industry</li> <li>- Conduct Malaysia Private Sector Partnership Appraisal</li> <li>- Facilitate the regional networking and recognition of women leaders in fisheries promoting human welfare and gender equity</li> <li>- Provide in-country training on gender sensitivity/equity and human welfare tools in Thailand and Malaysia, as per country request</li> </ul>	
Sub-activity 4.2: Support Expansion 2 Sites	<ul style="list-style-type: none"> <li>- Facilitate eCDT exchanges/study tours between expansion II sites (Mekong region; non-ASEAN CTI Member Countries) and learning sites (Bitung/Manado; General Santos)</li> </ul>	



Proposed Activity	Description of Proposed Activity	Proposed Budget
	<ul style="list-style-type: none"> <li>- SEAFDEC support provided to TWG reps from expansion countries to national/site level training and workshops</li> <li>- Bundled technology solutions, software, guidance, and technical specifications for eCDT systems; "CDT in a box"</li> <li>- Support SEAFDEC design of Viet Nam eACDS implementation and roadmap development</li> <li>- Support validation of Viet Nam CDT gaps; provide technical assistance to support Viet Nam eACDS roadmap implementation</li> <li>- Facilitate the regional networking and recognition of women leaders in fisheries promoting human welfare and gender equity</li> <li>- Provide in-country training on gender sensitivity/equity and human welfare tools in Mekong (Expansion II) countries/sites, as per member country request</li> </ul>	

## 2. Expected Outcomes/Outputs of Activity for the Year 2019

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1: Regional Support and Engagement	<ul style="list-style-type: none"> <li>- Enhanced regional capacity across program workstreams (CDT, EAFM, human welfare)</li> <li>- Increased coordination across regional bodies, including SEAFDEC, CTI-CFF and national governments through the Technical Working Group mechanism</li> <li>- Development of technical addendum to existing ACDS Regional Guidelines in coordination with SEAFDEC, including development support for national government roadmap to implement regional guidelines</li> <li>- Support provided to SEAFDEC on rollout, testing, and implementation of eACDS with interested expansion countries</li> <li>- Programmatic and learning site activities, best practices communicated to key stakeholders; documented through core Legacy Documents across workstreams</li> </ul>
Activity 2: Support to the Philippines and Learning Site of General Santos City	<ul style="list-style-type: none"> <li>- Enhanced capacity of stakeholders, TWG representatives across program workstreams (CDT, EAFM, human welfare)</li> <li>- Increased coordination between relevant stakeholders, including government and private sector partners</li> <li>- Learning site eCDT system fully operational, with end-to-end traceability demonstrated</li> <li>- Learning site SFMP socialized, monitored; use of eCDT data to improve fisheries management decision making and strengthen fish stock assessment efforts demonstrated</li> <li>- Gender interventions implemented through a grant on "Raising Awareness of Gender Equity and Women Empowerment in Fisheries Management"</li> </ul>
Activity 3: Support to Indonesia and Learning Site of Bitung	<ul style="list-style-type: none"> <li>- Enhanced capacity of stakeholders, TWG representatives across program workstreams (CDT, EAFM, human welfare)</li> <li>- Increased coordination between relevant stakeholders, including government and private sector partners</li> <li>- Learning site eCDT system fully operational, with end-to-end traceability demonstrated</li> <li>- Learning site SFMP socialized, monitored; use of eCDT data to improve fisheries management decision making and strengthen fish stock assessment efforts demonstrated</li> <li>- Gender interventions implemented through a grant on "Raising Awareness of Gender Equity and Women Empowerment in Fisheries Management"</li> </ul>

	Management”
Activity 4: Support to Expansion I and II Sites	<ul style="list-style-type: none"> <li>- Provide technical support and guidance to Expansion Site countries on development and implementation of eCDT technologies; conduct and complete eCDT and Partnership Appraisals</li> <li>- eCDT exchanges/study tours facilitated between expansion II sites (Mekong region; non-ASEAN CTI Member Countries) and learning sites (Bitung/Manado; General Santos)</li> <li>- Regional networking facilitated and recognition of women leaders in fisheries promoting human welfare and gender equity</li> </ul>

### 3. Schedule of Activity for the Year 2019

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1: Regional Support and Engagement												
Sub-activity 1.1: Support Regional Capacity Building and Coordination												
Sub-activity 1.2: Develop and Implement a Regional PPP and Industry Engagement Strategy												
Sub-activity 1.3: Build Regional Capacity for CDT												
Sub-activity 1.4: Support Development of Regional Fisheries Management Plan(s)												
Sub-activity 1.5: Integrate Fair Labor and Gender Equity Considerations at the Regional Level												
Sub-activity 1.6: Implement Regional Communication Strategy												
Activity 2: Support to the Philippines and Learning Site of General Santos City												
Sub-activity 2.1: Integrated Support for National and Local Activities												
Sub-activity 2.2: Support and Develop Partnerships to Strengthen National and Local Impact												
Sub-activity 2.3: Strengthen Capacity for CDT/Develop and Implement CDTS												
Sub-activity 2.4: Develop Fisheries Management Plan												
Sub-activity 2.5: Integrate Fair Labor and Gender Equity Considerations												
Activity 3: Support to Indonesia and Learning Site of Bitung												
Sub-activity 3.1: Integrated Support for National and Local Activities												
Sub-activity 3.2: Support and Develop Partnerships to Strengthen National and Local Impact												
Sub-activity 3.3: Strengthen												

<b>Proposed Activity</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
Capacity for CDT/Develop and Implement CDTS												
Sub-activity 3.4: Develop Fisheries Management Plan												
Sub-activity 3.5: Integrate Fair Labor and Gender Equity Considerations												
<b>Activity 4: Support to Expansion I and II Sites</b>												
Sub-activity 4.1: Support Expansion I Sites												
Sub-activity 4.2: Support Expansion 2 Sites												

## Annex 6

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES FOR THE YEAR 2018-2019****I. Aquaculture Department (Appendix 1)**

<b>Programs/Projects</b>	<b>2018</b>	<b>2019</b>	<b>Appendix No.</b>
1. Quality Seed for Sustainable Aquaculture	Y	Y	2
2. Healthy and Wholesome Aquaculture	Y	Y	3
3. Adapting to Climate Change	Y	Y	4
4. Maintaining Environmental Integrity through Responsible Aquaculture	Y	Y	5
5. Meeting Social and Economic Challenges in Aquaculture	Y	Y	6
6. Priority and Special Projects	Y	Y	7

**II. Training Department (Appendix 8)**

<b>Programs/Projects</b>	<b>2018</b>	<b>2019</b>	<b>Appendix No.</b>
7. Promotion on Strengthening of SEAFDEC Visibility and Image	Y	Y*	9
8. Tailor-made Training Programs	Y		10
9. Improvement of Fisheries Technology and Reduction of the Impact from Fishing	Y	Y	11

**III. Marine Fishery Resources Development and Management Department**

<b>Programs/Projects</b>	<b>2018</b>	<b>2019</b>	<b>Appendix No.</b>
10. Collaboration Research between JIRCAS and SEAFDEC/MFRDMD	N	Y	12

**IV. Inland Fishery Resources Development and Management Department (Appendix 13)**

<b>Programs/Projects</b>	<b>2018</b>	<b>2019</b>	<b>Appendix No.</b>
11. Stock Assessment and Fish Production Potential of Inland Fisheries	Y	Y	14
12. Center of Excellence for Fisheries Management on Inland Waters	Y	Y	15



**Overall Review  
of the Departmental Program Implementation in the Year 2018**

**AQUACULTURE DEPARTMENT**

**1. Quality Seed and Sustainable Aquaculture (QSSA)**

QSSA aims to generate, verify and promote technologies to ensure the sustainable production of quality seedstock for aquaculture as well as for stock enhancement.

The program successfully conducted studies to develop good quality broodstock for Philippine native catfish, tropical abalone, and black tiger shrimp including stock improvement of seaweeds.

The program also conducted studies in refining hatchery and nursery management to improve seedstock production of commodities including anguillid eel, silver therapon, groupers, seaweeds, milkfish, mangrove crab, sandfish, and abalone. Successful production and rearing of natural food with algal paste and polychaetes were also optimized. There are 18 studies under this program.

**2. Healthy and Wholesome Aquaculture (HWA)**

HWA 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.

Under fish health management, the use of conventional and new diagnostic methods for emerging diseases and biosecurity were promoted by using Quantitative Reverse Transcription – PCR to detect and quantify Tilapia Lake Virus (TiLV) in pond soil, water and fish samples as well as sampling of diseases and pests in seaweeds for compilation in open-access database and biobanks. Efficacy of different therapeutants was tested to control *Caligus* sp. (sea lice) infestation in pompano as a part of finding effective and safe alternative drug to manage aquaculture diseases. Production of shrimp (*Penaeus vannamei* and *Penaeus indicus*) were also demonstrated in using bio-secured methods to ensure sustainable supply.

For nutrition, alternative protein sources were studied for black tiger shrimp, mangrove crab, tilapia larvae, and economically-important finfish. Nutrients to enhance growth performances was also tested including quantifying of amino acid requirement of Asian seabass juveniles and assessing the potential of thraustochytrid as alternative lipid source for fish oil in hatchery-bred abalone. The program conducted a total of 13 studies in 2018.

**3. Adapting to Climate Change (CC)**

CC aims to identify changes in the environment brought about by the changing climate that may affect the aquaculture sector. It also prepares the sector to the possible effects of these changes, minimize and mitigate the adverse impacts of climate, and ensure the continued operation of all aquaculture production systems under changing climatic conditions.

The program generated scientific information on the effects of high water temperature on reproductive performance and recruitment of economically important aquaculture commodities.

**4. Maintaining Environmental Integrity Through Responsible Aquaculture (MEITRA)**

MEITRA aims to develop environment-based aquaculture technology by integrating environmental factors in SEAFDEC/AQD research activities and to maintain environmental integrity by promoting responsible aquaculture practices.

The program successfully develops and promotes efficient and suitable environment-friendly culture systems. Culture methods were improved for abalone (developed technology using pipes for grow-out), giant freshwater prawn (stock ablation and management), polychaetes (using cheese cloth installed in

brackishwater ponds), and finfish, crustacean, mollusks, and seaweeds (sustainable hatchery and grow-out technologies).

Underwater assessment of SEAFDEC/AQD's stations (Tigbauan Main Station and Igang Marine Station) were done to assess status and environmental conditions.

## **5. Meeting Social and Economic Challenges in Aquaculture (MSECAP)**

MSECAP aims to develop and implement social and economic strategies in aquaculture and resource management to secure food and income through stakeholder collaboration.

Collaborative research and development in aquaculture were prioritize to have a clear regional assessment and understanding of the role of aquaculture in poverty alleviation. A survey on anguillid eels aquaculture industry resulted to identification of problem areas including presence of diseases, illegal trade of glass eels, and high cost of feeds. The results will be used to recommend future policies. Seaweed farming was also assessed to view its current and potential contribution to poverty reduction, and sustainable and resilient economic growth.

Emerging issues on the impacts of climate change and global trade was also assessed through the study of economic benefits and losses by using climate change indicators in seaweed farming.

The program established collaboration and linkages with local and fisherfolk association in Guimaras, Philippines to enable local stakeholders to manage the IMTA set-up and prepare the fisherfolks to independently continue the aquaculture operations upon end of the project.

## **6. Priority and Special Projects**

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.

*Oplan Balik Sugpo* activities commenced including production of quality and pathogen-free fry and demonstration for grow-out in ponds are ongoing. Biosecurity of hatcheries and ponds in SEAFDEC/AQD stations were also enhanced. Low-cost feed formulations for commercially important finfishes starting with the successful demonstration low-cost feeds for milkfish.

Sixteen trainees successfully graduated from the Manpower Development internship training to augment the need for aquaculture experts across the country.

SEAFDEC/AQD, funded by Bureau of Fisheries and Aquatic Resources, conducted site assessment on legislated hatcheries to prepare for the development plans in the establishment of 15 multi-species fish hatcheries in seven provinces around the Philippines.

## **SEAFDEC Departmental Programs of Activity For The Year 2018-2019**

### **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 32 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) Adapting to Climate Change Impacts, and (v) Meeting Social and Economic Challenges in Aquaculture. Priority and special projects are also included in this year's activities.

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. Adapting to Climate Change Impacts
4. Maintaining Environmental Integrity through Responsible Aquaculture
5. Meeting Social and Economic Challenges in Aquaculture
6. Priority and Special Projects



## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Quality Seed for Sustainable Aquaculture  
**Responsible Department:** Aquaculture Department  
**Total Duration:** 2016-2020  
**Funding Sources:** AQD and Global Seaweed Star  
**Estimated Budget for 2019:** Php 39,205,000.00

### 1. INTRODUCTION

For years, Southeast Asia has been known as a major contributor to world aquaculture production. This can be attributed to the fact that most Asian countries have developed and refined seed production and farming techniques for major commercially important aquaculture species and are now more aware of the merits of using quality seeds in aquaculture.

Good quality seedstock means fit, clean, uniformly-sized fry, fingerlings, and juveniles that subsequently express good performance attributes during culture. These beneficial traits are desirable color, shape, good growth, health, efficient feed conversion, high reproduction, tolerance to and survival in poor and/or extreme environmental conditions.

### 2. PROJECT

#### 2.1 Goal /Overall Objectives

The goal of the program is to generate, verify and promote technologies to ensure the sustainable production of quality seedstock for aquaculture as well as for stock enhancement.

#### 2.2 Outcomes and Expected Outputs

- Develop good quality broodstock for both traditional and emerging species through domestication, genetic and nutritional intervention, and the implementation of proper stock management protocols
- Improve quality and production of seedstocks through the refinement of hatchery and nursery management methods
- Develop schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks
- Produce sufficient seedstocks through economically viable seed production systems

#### 2.3 Project Description/Framework

This program focuses on studies and activities that determine the optimal conditions and methods for the production of quality seed stock in sufficient quantities. The research activities entail the use of methods of stock improvement such as domestication, broodstock management, strain evaluation and selective breeding or genetic improvement of traditional and emerging freshwater and marine species.

- Activity 1: Explore genetic intervention to enhance traits such as growth rate, survival, disease and stress tolerance that ultimately lead to the production of good quality seedstock
- Activity 2: Consider nutritional intervention for broodstock and seedstock improvement
- Activity 3: Develop and refine suitable hatchery and nursery protocols on the level of technology for each species. Once technology matured, it shall be verified and packaged into viable or cost-effective method for broodstock and seed production
- Activity 4: Inform industry stakeholders, primarily fish farmers, of the advances in seed production methods through training, information dissemination and extension work

**3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018**

Project/Activity Title	Duration	Remarks
<p><u>Philippine native catfish broodstock development and management</u></p> <p>Developing good quality Philippine native catfish (<i>Clarias microcephalus</i>) broodstock is ongoing. Stocks were sourced from Zambales and Quezon, however mostly are <i>Clarias batrachus</i> and only one was morphologically identified as <i>C. microcephalus</i>. Collection will continue until <i>C. microcephalus</i> is found. With this, it was suggested to cover <i>C. batrachus</i> since it is also a native species.</p> <p>Development of cost-efficient maturation diets for use in aquaculture and for the sustainable production of fry, fingerling and marketable size of native catfish is being done. Prior to spawning, stocks from the wild were fed with broodstock diets for weeks with the following: (1) diet + paprika; (2) diet + mango peel; and (3) diet + combination of paprika and mango peel. Following the feeding experiments, broodstocks from Zambales were induced to spawn. Spawning of stocks from Quezon will be slated as soon as stocks are mature.</p>	<p>January-September 2018</p>	<p>Ongoing</p>
<p><u>Domestication of the Philippine native eel</u> <u><i>Anguilla</i> spp. (Teleostei: Anguillidae)</u></p> <p>Domestication studies on Philippine native eel (<i>Anguilla</i> spp.) are currently being done. The study aims to compare the growth and survival of glass eels and young elvers under various schemes and formulated diets. Test runs are being done in three experiments in Aparri and Mindanao glass eels with different weaning duration.</p> <p>Protocols on health management for anguillid eels nursery is also being developed. Species and water samples were collected from commercial farms as well as in AQD nursery facility for analysis of bacteria and other pathogens.</p> <p>Morphological and genetic confirmation of identities of different eels species (glass eel stages) is underway. So far, AQD identified 77 <i>A. luzonensis</i> and 19 <i>A. marmorata</i> from Aparri and 94 <i>A. marmorata</i> and only one <i>A. bicolor pacifica</i> from Mindanao. Identification by morphology requires further confirmation by metric and genetic analysis using mitochondrial cytb gene.</p>	<p>January-September 2018</p>	<p>Ongoing</p>
<p><u>Domestication of silver therapon</u></p> <p>Nutritional evaluation of wild-sourced and hatchery-bred stocks for feed development. Reproductive performance of wild and hatchery-bred silver therapon</p> <p>This year, study on the reproductive performance of wild-sourced and hatchery-bred silver therapon was completed. Out of four treatments (CW at 30%, 40% and 50%, and BFT at 50%), two treatments (40% and 50%) yielded 100% spawning success.</p>	<p>January-September 2018</p>	<p>Ongoing</p>
<p><u>Breeding and seed production of the giant grouper <i>Epinephelus lanceolatus</i></u></p> <p>Production of hybrid groupers is being conducted. The produced hybrid juveniles between <i>Epinephelus lanceolatus</i> and <i>E. coioides</i> were found to have improved growth and are diseases resistance.</p>	<p>January-September 2018</p>	<p>Ongoing</p>

Project/Activity Title	Duration	Remarks
<p>Induced spawning of giant groupers are also being done. However, due to low fertilization and unsynchronized oocyte and sperm cycle; strip spawn or artificial fertilization was done as an alternative. The use of <i>Proales similis</i> as initial food was also studied under the project and percent larval survival for <i>E. coioides</i> and <i>E. fuscoguttatus</i> were tested for 35 days.</p>		
<p><u>Developing transport techniques for milkfish <i>Chanos chanos</i> juveniles</u></p> <p>Development of transport techniques for milkfish <i>Chanos chanos</i> juveniles is ongoing. Results shows that juveniles (5-7 in) can be transported for up to 12 hours in a closed system under various salinities, treatments and combinations with minimal mortalities. Stock 2 fish per liter with four weeks of conditioning yields best survival rate (100.00±0.00<sup>a</sup>) but the treatment with 4 fish per liter at 50 ppm with one week conditioning garnered optimum results (83.33±3.63).</p>	January-September 2018	Ongoing
<p><u>Effects of water depth, temperature and methyl farnesoate on the mating behavior and reproductive performance of black tiger shrimp (<i>Penaeus monodon</i>) broodstock</u></p> <p>For tiger shrimp, effects of various factors (water depth, temperature and methyl farnesoate) on mating behavior and reproductive performance on <i>Penaeus monodon</i> is in progress. Mating performance between captive and wild-caught tiger shrimp are being tested and the effects of depth and temperature are being evaluated.</p>	January-September 2018	Ongoing
<p><u>Safeguarding the future of the Seaweed Industry of the Philippines: Stock Improvement</u></p> <p>Studies on stock improvement for seaweed is also in progress. It aims to characterize, conserve and exploit algal genetic resources towards crop improvement. The staff under the project had undergone capacity building in United Kingdom to enhance both technical and professional skills. Initial collection of wild (12) and (18) farmed <i>Kappaphycus</i> and <i>Eucheuma</i> had been done. Seven wild and two farmed samples have epiphyte infestation, one farmed has ice-ice disease, one wild and five farmed seaweeds have other possible, unidentified diseases and nine of the wild samples are fertile.</p>	January-September 2018	Ongoing
<p><u>Production of <i>Kappaphycus</i> plantlets</u></p> <p>An ongoing study on production of <i>Kappaphycus</i> plantlets had successfully demonstrated production of plantlets in all phases from land-based nursery (3 months) to sea-based nursery (2 months) to transplantation to farms in the Philippines. Transplantation activities yielded 89.1 kg (Guimaras.), 24 kg (Samar), 13.3 kg (Zamboanga), and 77 kg (Antique).</p>	January-September 2018	Ongoing
<p><u>Refinement of mud crab hatchery technology: Sustainable production of mud crab through selective breeding</u></p> <p>Genetic improvement of mangrove crab (<i>Scylla serratta</i>) to develop selective breeding techniques was done for sustainable production of the species. Breeding performance for various generations were recorded and will be correlated to genetic (marker variation) data. Genetic diversity of stocks from each generations will be analyzed and genetic changes will be monitored for inbreeding.</p>	January-September 2018	Ongoing

Project/Activity Title	Duration	Remarks
<p><u>Use of algal paste in the larval rearing of mangrove crab <i>Scylla serrata</i></u></p> <p>For nutrition of mangrove crab, the use of algal paste in larval rearing is being studied. It aims to evaluate the efficiency of rotifer production using algal paste compared to cultured algae. It was recommended for daily addition of paste in the rotifer culture.</p>	January-September 2018	Ongoing
<p><u>Seed production of mangrove crab <i>Scylla serrata</i></u></p> <p>Mass production of crab instars for income generation at AQD's hatchery is still being continued. Latest records show that 278,420 pieces (Php 1,121,736.00) of instars were sold.</p>	January-September 2018	Ongoing
<p><u>Assessment of tank-based nursery system of sandfish <i>Holothuria scabra</i></u></p> <p>Tank-based primary and secondary nursery system of sandfish (<i>Holothuria scabra</i>) is being assessed. Early juvenile sandfish stocks reared in AQD's Big Hatchery have good survival (~85%) weighing 0.5 g for 30 days. Upon transfer to AQD's Integrated Marine Hatchery, it yields more than 90% survival but with slower growth of less than 2 g in 90 days of culture.</p> <p>In secondary nursery system for late juveniles, sandfish in Integrated Marine Hatchery tank bottom yields a growth of 15 to 20 g in 15 to 30 days. From May to August, a total of 2,457 juveniles became available.</p>	January-September 2018	Ongoing
<p><u>Optimizing hatchery production of early juveniles sandfish <i>Holothuria scabra</i></u></p> <p>Hatchery enhancement e.g. refurbishing of sandfilter system and possible installation of heating systems in larval tanks are being done to optimize the hatchery production of early juvenile sandfish. It aims to increase the survival of sandfish juveniles to 5% and produce at least 20,000 early juvenile sandfish per spawning batch.</p> <p>Broodstock for the experiment are being maintained in Sagay and Concepcion. By January to April, the average survival is 2.16% and by June to August it decreased to 0.22%-0.82% due to low salinity.</p>	January-September 2018	Ongoing
<p><u>Verification of the effectiveness of SEAFDEC/AQD broodstock diets in improving reproductive performance in the tropical abalone <i>Haliotis asinina</i></u></p> <p>The effectiveness of SEAFDEC/AQD broodstock diets in improving reproductive performance and larval quality in tropical abalone (<i>Haliotis asinina</i>) is being verified. Formulated treatment diets for testing are as follows: diet 1 (control, seaweed); diet 2 (37% P : 3750 kcal/kg E feed); and diet 3 (42% P : 3750 kcal/kg E feed). Wild caught breeders from Sagay spawned in February and F1s are being reared to pre-broodstock stage prior the commencement of the feeding experiment. Hatchery-bred stock also spawned in August and is for further rearing before feeding experiment starts.</p>	January-September 2018	Ongoing
<p><u>Large-scale production of donkey's ear abalone <i>Haliotis asinina</i> juveniles</u></p> <p>For abalone, a large-scale production of juveniles to achieve increased production efficiency at a lower production cost is still ongoing. Abalone juvenile production had increase in 2018 by increasing the frequency of diatom feeding and adoption of micro-particulate diet.</p>	January-September 2018	Ongoing

Project/Activity Title	Duration	Remarks
<p><u>Optimization of electrolytic flocculator for paste production of important locally available microalgae in aquaculture</u></p> <p>Paste production of locally available microalgae using electrolytic flocculator is being optimized. The number of aluminum tubes and lead plates were tested together with different voltage settings during <i>Chaetoceros calcitrans</i> production. Highest <i>C. calcitrans</i> paste biomass obtained was using 10 volts at <math>0.646 \pm 0.17</math> kg followed by 6 volts with <math>0.366 \pm 0.06</math> kg. Biochemical and Chlorophyll analysis of samples are ongoing. Samples for Lead analysis were sent to Negros Prawn Diagnostic Laboratory. This is to establish the optimum conditions for microalgae productions in terms of current or power source, salinity, and metal type or fouling. It also aims to determine paste quality based on viability, storage, and metal residue.</p>	January-September 2018	Ongoing
<p><u>Refinement of rearing and feeding techniques for sustainable mass production of polychaete <i>Marphysa</i> sp.</u></p> <p>Polychaetes (<i>Marphysa</i> sp.) rearing and its feeding techniques are still being refined. The effectiveness of biofloc technology (BFT) was compared against natural food items as started feed and settlement substrate for early state polychaetes. Polychaete survival was found higher in BFT by 60% compared to diatom treatments. Critical phase of early larval development of polychaete is at 45 days with 13% survival rate. Effect of irradiance and photoperiod on egg hatch ability and larval growth was assessed and having no irradiance is the best condition for <i>Marphysa</i> sp. in grow-out.</p>	January-September 2018	Ongoing

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p><u>Nile tilapia</u></p> <ul style="list-style-type: none"> <li>- Continue GOJ-TF study on agricultural wastes as feed ingredient</li> <li>- Collaborate with Central Luzon State College and De La Salle University on Tilapia Genomics (assessment of 36<sup>th</sup>-38<sup>th</sup> generation FAST Tilapia for performance traits <i>e.g.</i> growth, FCE, survival, disease resistance) and for DOST funding, if approved</li> </ul>	2019	Ongoing
<p><u>Philippine native catfish broodstock development and management</u></p> <p>To continue breeding and feed development study</p>	2019	Ongoing
<p><u>Domestication of the Philippine native eel <i>Anguilla</i> spp. (Teleostei: Anguillidae)</u></p> <p>To continue domestication study</p>	2019	Ongoing
<p><u>Domestication of silver therapon</u></p> <p>Study on nutrition and reproductive performance will continue</p>	2019	Ongoing
<p><u>Breeding and seed production of the giant grouper <i>Epinephelus lanceolatus</i></u></p> <p>To continue further studies on breeding and seed production</p>	2019	Ongoing

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
<u>Effects of water depth, temperature and methyl farnesoate on the mating behavior and reproductive performance of black tiger shrimp (<i>Penaeus monodon</i>) broodstock</u>  To continue ongoing breeding study and propose new studies on other aspects of breeding	2019	Ongoing
<u>Safeguarding the future of the Seaweed Industry of the Philippines: Stock Improvement</u>  To continue GlobalSeaweedSTAR project on genetic characterization	2019	Ongoing
<u>Production of <i>Kappaphycus</i> plantlets</u>  To continue improving and testing of new production methods for <i>Kappaphycus</i>	2019	Ongoing
<u>Refinement of mud crab hatchery technology: Sustainable production of mud crab through selective breeding</u> - Complete the data analysis (4 <sup>th</sup> quarter of 2018), write up of terminal report for 2018, and publish DOST-funded selective breeding study in scientific publications by 2019 - Continue algal feed study and mangrove crab production - Collaborate with De La Salle University, University of the Philippines – Marine Science Institute and University of San Agustin for mangrove crab genetics (nutrigenomics and pathogenomics) study and for DOST funding, if approved	2019	Ongoing
<u>Use of algal paste in the larval rearing of mangrove crab <i>Scylla serrata</i></u>  To evaluate efficiency of rotifer production using algal paste compared to batch culture of algae and determine performance of crab larvae given algal paste-fed rotifers	2019	Ongoing
<u>Seed production of mangrove crab <i>Scylla serrata</i></u>  Seed production operations will continue at SEAFDEC/AQD to supply the needs for both research and stakeholders	2019	Ongoing
<u>Assessment of tank-based nursery system of sandfish <i>Holothuria scabra</i></u>  Continue both studies (assessment of tank-based nursery system and optimizing hatchery production of early juveniles) in 2019	2019	Ongoing
<u>Optimizing hatchery production of early juveniles sandfish <i>Holothuria scabra</i></u>  Experiments to further optimize hatchery production of sandfish will continue	2019	Ongoing
<u>Verification of the effectiveness of SEAFDEC/AQD broodstock diets in improving reproductive performance in the tropical abalone <i>Haliotis asinina</i></u>  Actual feeding experiments following the growth of F1s into pre-broodstock stage	2019	Ongoing
<u>Large-scale production of donkey's ear abalone <i>Haliotis asinina</i> juveniles</u>  The large-scale production of juveniles for research and for the industry will continue	2019	Ongoing
<u>Optimization of electrolytic flocculator for paste production of important locally available microalgae in aquaculture</u>	2019	Ongoing

Project/Activity Title	Duration	Remarks
Experiments will continue to determine paste quality based on viability, storage, and metal residue		
<u>Refinement of rearing and feeding techniques for sustainable mass production of polychaete <i>Marphysa</i> sp.</u>  Experiments to define optimum stocking density in the nursery phase and sediment requirement in growout phase are ongoing and will continue	2019	Ongoing

#### 4.2 Expected Outcomes/Outputs

The program aims to develop good quality broodstock to bridge the gap of inadequate and unreliable supply of good quality seedstocks. For 2018, broodstock of priority commodities will be improved through domestication, evaluation of genetic markers, enhancing reproductive performance, and finding cost-effective and healthy diet formulation.

Production of disease-free seedstocks is also one of the expected outputs under the program. Through refining hatchery and nursery management, it can improve seedstock production. Activities under this objective includes development of health management protocols, hybridization, development of transport techniques, genetic improvement, production of natural food *e.g.* algal paste and polychaetes.

**PROJECT DOCUMENT**

**Program Categories:** Departmental Programs  
**Project Title:** Healthy and Wholesome Aquaculture  
**Responsible Department:** Aquaculture Department  
**Total Duration:** 2016-2020  
**Funding Sources:** AQD and Global Seaweed Star  
**Estimated Budget for 2019:** Php 34,490,000.00

**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 the world today.

**2. PROJECT**

**2.1 Goal /Overall Objectives**

The goal of the program is to improve aquaculture production through innovations in nutrition and feeding, and fish health management in aquaculture.

**2.2 Outcomes and Expected Outputs**

- Find alternative protein sources to replace fish meal in dietary formulations
- Determine specific ingredients that enhance growth performance
- Promote practices or strategies to improve production
- Investigate the efficacy of probiotics
- Rationalize the need and application of diagnostics that will ensure biosecurity within culture systems
- Promote wider use of conventional and new diagnostic methods, especially for emerging diseases
- Find effective and safe alternative drugs and chemicals (including natural products) to manage aquaculture diseases

**2.3 Project Description/Framework**

The strategies invoked in this program will concentrate on the following:  
 Activity 1: Nutrition to promote healthy farmed aquatic animals;  
 Activity 2: Disease diagnosis, control, monitoring and surveillance of aquatic animals;  
 Activity 3: Environmental integrity, certification, and food safety

**3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018**

Project/Activity Title	Duration	Remarks
<p><u>Evaluation of raw meal, fermented and live green macroalgae <i>Chaetomorpha linum</i> as food source for farmed <i>Penaeus monodon</i></u></p> <p>Raw meal, fermented and live green macroalgae (<i>Chaetomorpha linum</i>) was evaluated as food source for farmed tiger shrimp <i>Penaeus monodon</i>. <i>C. linum</i>, collected from two locations in AQD’s Tigbauan Main Station, contains the following nutrients: crude protein = 15-17%; crude fat = 0.9 = 1.6% and nitrogen-free extract = 19-48%.</p>	<p>January-September 2018</p>	<p>Ongoing</p>



Project/Activity Title	Duration	Remarks
<p><u>Evaluation of Phytoecdysteroids Crude Extract (PCE) from Spinach in Molting and Growth of Mangrove Crabs, <i>Scylla serrata</i></u></p> <p>Using of PCE from spinach to induce mangrove crab molting, which is important in the production of soft-shell crabs, was evaluated. Three experimental runs were done: (1) 1 kg of fresh spinach produced 120 g freeze-dried powder; (2) 143 g freeze dried spinach produced 0.647 g colloidal substance; and (3) 8 kg fresh spinach yielded 4.34 g colloidal substance (PCE).</p>	January-September 2018	Ongoing
<p><u>Hatchery production &amp; semi-intensive pond culture of <i>Peneaus indicus</i></u></p> <p>The hatchery production and semi-intensive pond culture of white shrimp <i>Peneaus indicus</i> are being improved for sustainable supply.</p> <p>For hatchery, broodstocks were sourced from Antique and were placed in tanks with 10 pairs of male and female. After 30 days of culture, a total of 17,000 postlarvae (PLs) were produced. Most larvae were discarded or did not proceed to PL due to lack of diatoms.</p> <p>For semi-intensive pond culture, a study compares shrimp growth by using formulated feeds for <i>P. vannamei</i> and tilapia. Six ponds (700-800 m<sup>2</sup>/pond) in AQD's Dumangas Brackishwater Station were prepared (cracked dried and applied with lime) with inorganic fertilizers (46-0-0 and 16-20-0), teased powder and crustascide. Each ponds were stocked at 20 ind/ m<sup>2</sup> wherein three ponds are for testing <i>P. vannamei</i> feeds and the other three is for tilapia feeds.</p>	January-September 2018	Ongoing
<p><u>Evaluation of protein enhanced copra meal (PECM) as dietary protein source for economically important finfish</u></p> <p>Protein enhanced copra meal (PECM) was also evaluated as dietary protein source for economically-important finfish. PECM has the following nutrient composition: crude fat = 41.32%; crude fat = 5.47%; nitrogen-free extract = 43.18%; ash = 8.19%; and crude fiber = 5.82%. Grouper (<i>Epinephelus fuscoguttatus</i>) juveniles were used for trials and were fed with experimental diets (PECM levels: 0%, 4%, 8%, 12%, 16% and 16% plus amino acids) for 70 days. Compared to soybean meal, there's no significant differences in fish performance parameters (e.g. body weight, survival, feed intake). In addition, normal structures of the digestive tract were observed and liver morphology was not altered by the dietary treatments.</p>	January-September 2018	Ongoing
<p><u>Quantitative amino acid requirements of juvenile Asian sea bass (<i>Lates calcarifer</i> Bloch): requirements for Leucine, Isoleucine and Histidine</u></p> <p>Amino acid (leucine, isoleucine and histidine) requirement for Asian sea bass juveniles are being quantified. In lieu of sea bass due to unavailability during testing period, grouper (<i>E. fuscoguttatus</i>) juveniles were tested in six diets for leucine (levels: 0%, 0.25%, 0.5%, 0.75%, 1.0% and 1.25%). Each test diets have amino acid mixture with aspartic acid (13.5%) and Peruvian fish meal with squid meal (60%). Following the 8-week trial, the leucine requirement for grouper is 2.89%. Proximate composition analysis, amino acid analysis, and protein retention together with more data analysis are still ongoing.</p>	January-September 2018	Ongoing

Project/Activity Title	Duration	Remarks
<p><u>Effect of thraustochytrid on reproductive performance of hatchery-bred abalone, <i>Haliotis asinina</i></u></p> <p>The potential of thraustochytrid as alternative lipid source for fish oil in hatchery-bred abalone (<i>Haliotis asinina</i>) was assessed. Abalone juveniles had been reared to broodstock sizes specifically for the experiment. Protocol for harvesting cultured thraustochytrid changed from 4 days to 3 days. Culture and harvesting of thraustochytrid is ongoing to meet the required amount of extracted thraustochytrid oil.</p>	January-September 2018	Ongoing
<p><u>Detection, quantification and viability of Tilapia Lake Virus (TiLV) in pond soil and water as influenced by water quality parameters and culture management</u></p> <p>Tilapia Lake Virus (TiLV), an RNA virus, is an emerging disease that could be a serious threat to aquaculture of tilapia in Asia. Hence, a study on detection and quantification and viability of TiLV in pond soil and water influenced by water quality parameters and culture development is ongoing.</p> <p>The study aims to detect and quantify TiLV in pond soil, water, and fish samples using Quantitative Reverse Transcription – PCR (qRT-PCR) and correlate these with water quality parameters. It also aims to evaluate if there is significant difference among ponds in terms of the following: (1) number of tilapia positive for TiLV; (2) number of dead tilapia positive for TiLV; (3) TiLV load in the soil, water, and tilapia samples.</p> <p>Soil and tilapia samples were taken from the wild; one in Laguna de Bay and three other farms. Two of the farms (Bata-an and Pampanga) have history of TiLV and one has none (Tarlac). High amount of RNA were yielded from the soil samples using Phenol-Chloroform Isoamyl method (Miura, <i>et al</i> 2011 with modifications).</p>		
<p><u>Efficacy of different therapeutants against <i>Caligus</i> sp. infestation in tropical fish under laboratory conditions</u></p> <p>A newly approved study to test the efficacy of different therapeutants against <i>Caligus</i> sp. (sea lice) in tropical fish under laboratory conditions had begun. The objectives of the study include the investigation of toxic effects of emamectin benzoate in pompano (<i>Trachinotus blochii</i>), determine the effective dose in laboratory assay by exposing pre-adult and adult sea lice collected from infested pompano; and evaluate the efficient oral administration of emamectin benzoate in the control of sea lice infestation in pompano. The researchers are now currently rearing pompanos to juvenile stages to be used for the testing.</p>	January-September 2018	Ongoing
<p><u>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</u></p> <p>The production of <i>Penaeus vannamei</i> using Biofloc System with sludge removal facility in old earthen brackishwater ponds during wet season as well as verifying the economic benefits of using the system, was demonstrated. Soil preparation was completed, biosecurity facilities <i>e.g.</i> bird-scare, crab fence were installed, and pond facilities <i>e.g.</i> feeding bridge, feeding boat, discharge pipe, depth gauge, secchi disks and others were fabricated. Supplies were purchased and awaiting arrival. The stocking will commence mid-October of this year.</p>	January-September 2018	Ongoing

Project/Activity Title	Duration	Remarks
<u>Safeguarding the future of the Seaweed Industry of the Philippines: Disease and Pest Detection</u>  Trial sampling has been done for detection of diseases and pests in (farmed and wild) seaweeds. Seaweed samples were taken from Inampulugan Island in Guimaras and were positive of various unidentified epiphytes. The objective of the study is to produce detection and molecular diagnostic tools to properly identify the pests and diseases in seaweeds. The identified samples will be compiled in a central, open-access database and biobanks.	January-September 2018	Ongoing
<u>Safeguarding the Future of the Seaweed Industry of the Philippines: Farm Management and Biosecurity</u>  This study is being conducted to determine the effectiveness of current biosecurity and legislation on seaweed farming in the Philippines. Existing legislative policies on seaweed farming were compiled and analyzed for a systematic review. Questionnaires were prepared and will be used for interviewing farmers in top three seaweed producing regions in the country to identify gaps in legislations and provide recommendations for future policy, legislation and farm management. Researchers under this study undergone a 6-month capacity building in the United Kingdom as part of the initial phase of the project.	January-September 2018	Ongoing

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Viability of hatchery-bred <i>P. indicus</i> in semi-intensive culture in ponds demonstrated and hatchery operations manual will be drafted	2019	Ongoing
Phytoecdysteroids Crude Extract (PCE) from Spinach for molting in crabs will be demonstrated	2019	Ongoing
Green macroalgae <i>C. linum</i> as food source for farmed <i>P. monodon</i> will be evaluated	2019	Ongoing
Requirement level of amino acid leucine of grouper will be identified	2019	Ongoing
Milkfish by-product hydrolysate for larval diets of tilapia will be evaluated	2019	Ongoing
Protein enhanced copra meal (PECM) as dietary protein source for two grouper species will be evaluated	2019	Ongoing
Thraustochytrid on reproductive performance of hatchery-bred abalone will be evaluated	2019	Ongoing
Poultry by-product meal as feed ingredient in milkfish grow-out diet will be demonstrated	2019	Ongoing
Requirement levels of three essential amino acids in seabass/grouper will be identified	2019	Ongoing
Existing grow-out diet for <i>P. indicus</i> will be refined/modified	2019	Ongoing
Effective level of PCE to induce crabs to molt will be identified	2019	Ongoing
Effective levels of alternative feed ingredients (PECM, fish hydrolysate, thraustochytrid extract, and <i>C. linum</i> ) for fish, tilapia larvae, abalone, milkfish and farmed <i>P. monodon</i> will be established	2019	Ongoing
Tilapia Lake Virus - Start 1-year sampling and monitoring - Samples positive for qRT-PCR detection of virus will be confirmed by histopathology - Cell culture work and pathogenicity of virus isolated in water,	November 2018 until 2019	Ongoing

Project/Activity Title	Duration	Remarks
soil and tilapia samples - Molecular analysis of virus isolated in water, soil and tilapia samples		
Efficacy of different therapeutants against <i>Caligus</i> sp. - evaluate the efficacy of other possible therapeutants such as hydrogen peroxide and herbal extract of onions at various concentrations as a preventive treatment against sea lice in pompano	2019	Ongoing
<i>Penaeus vannamei</i> using Biofloc System - Another run during the dry season to compare results with that of the wet season	2019	Ongoing
Seaweed (diseases and pest detection) - Surveillance/ monitoring of current & emergent diseases/ pest in seaweed farms/ producing regions - Formulation of proactive management protocols and tools for seaweed diseases	2019	Ongoing
Seaweed (farm management and biosecurity) - Interview farmers in ARMM and Region 4B as well as government officials e.g. personnel of BFAR - Work on Objective 2.3 and produce innovative 'tools', biosecurity protocols and legislative frameworks in collaboration with local and national stakeholders	2019	Ongoing
Address the issues and gaps per commodity - Continue studies on emerging diseases such as <i>Streptococcal</i> infection and vibriosis in marine fish - Incorporate a more in-depth study of the sea lice problem in pompano (elucidation of the mechanism of infection and development of prevention/control measures) to existing studies - Studies on prevention and control of <i>Amyloodinium</i> infections and update manual on finfish diseases - Address the lack of good quality shrimp fry by using probiotics in the hatchery phases and disinfection of <i>P. monodon</i> egg against diseases - Produce more rearing shrimp through polyculture and/or extensive method and create protocols to prevent diseases for small scale shrimp farmers - Update manuals and publications on shrimp diseases - Continue mangrove crab pathogenomics - Epidemiological and surveillance studies for emerging, re-emerging and mortality cases in fish and shrimp	2019	Ongoing

#### 4.2 Expected Outcomes/Outputs

This program is expected to improve aquaculture production through innovations in nutrition and feeding, and fish health management. Through the proposed activities, the program will continue to promote the wider use of conventional and new diagnostic methods for emerging diseases and biosecurity. The activities in studying Tilapia Lake Virus (TiLV) will continue as it is one of the most serious aquaculture threats in Asia.

Finding effective and safe alternative drugs to manage aquaculture diseases is also one of the expected outputs. For example, different therapeutants will be tested for efficacy in controlling sea lice infestation in pompano. The program will also produce whiteleg shrimp *Penaeus vannamei* using Biofloc System and the effectivity of the strategy will be tested through verification of its economic benefits.

Reducing the cost of feed formulations by using alternative ingredients will significantly benefit the fish farmers and the industry. Under this program, the following alternative ingredients are being studied: (1)

raw meal, fermented and live green macroalgae for shrimp; (2) PCE from spinach for mangrove crab molting; (3) milkfish by-product hydrosolysate for tilapia larvae; and (4) PECM for finfish.

Aside from alternative and low-cost feeds, determining specific nutrients that enhance growth performance is an important objective of this program. For example, amino acid (leucine, isoleucine and histidine) requirements for Asian sea bass juveniles and alternative lipid source (thraustochytrid) for abalone juveniles will be quantified.

## 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 2019:** -

### 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

Identify the accompanying changes in the environment brought about by the changing climate that may affect the aquaculture sector, prepare the sector to the possible effects that these changes may have on aquaculture operations, minimize and mitigate the adverse impact/s of climate change in aquaculture, and ensure the continued operation of all aquaculture production systems under changing climatic conditions.

#### 2.2 Outcomes and Expected Outputs

- Gather scientific information on the susceptibilities of various aquaculture species to the combined effects of increasing water temperature and acidity;
- Collect scientific data on the effects of climate change on production of natural live food organism for hatcheries and for pond culture systems;
- Promote public awareness on the possible effects of climate change on aquaculture activities and to the fish farmers;
- Assist other government agencies in the country and in the regional in gathering baseline information on aquaculture areas/sites that are vulnerable to climate change effects;
- Gather scientific information that will serve as basis for the formulation / design of alternative aquaculture systems that are adaptive to climate change;
- Collaborate with other institutions in the country and in the region in gathering baseline information on the effects of climate change on mangrove and coral reef ecosystems;
- Explore potential adaptive measures to mitigate the impact/s of climate change on the different aquatic farming systems

### 2.3 Project Description/Framework

Activities of the program address the important issues and recommendations that were discussed during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020, Fish for the People 2020: Adaptation to a Changing Environment. Areas in the region that are vulnerable to climate change-related effects will be identified and the kind of probably impacts will be determined so that appropriate adaptive measures can be proposed. The fish farmers and the general public will need to have better understanding about climate change and its likely impact/s to their livelihood opportunities for better preparation and adaptation. Since largely almost nothing is known how climate change will affect the biology of various species presently farmed and the various support systems, important data on this aspect will be generated to serve as basis for the mitigation measures that will be provided. Improvements and innovations on the different aquaculture holding systems and structures are also necessary in order to lessen and/or reduce the impact to fish supply production. How climate change affects important related ecosystems like the mangrove and coral reef ecosystems will be ascertained as well.

- Activity 1: Generate scientific information on the effects of increasing temperature and acidity on reproductive performance, early development, and susceptibility to diseases,
- Activity 2: Generate scientific data on the effect of climate change on the reproductive success, growth, survival and nutritional profile of microalgae and zooplankton commonly used in hatcheries
- Activity 3: Investigate effect of wide and abrupt temperature and salinity fluctuations on *lablab* production and composition in ponds
- Activity 4: Determine temperature and acidity levels that will induce occurrence of diseases, inhibit reproduction and consequently reduce production
- Activity 5: Conduct survey to search for high temperature and more acidic-tolerant species (stocks) and conduct trials to develop breeding, seed production and culture techniques for candidate resilient species
- Activity 6: Promote awareness on the potential effects of climate change on aquaculture
- Activity 7: Conduct survey of sites and areas used for aquaculture activities in the country and the region that are most vulnerable to climate change

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018

Project/Activity Title	Duration	Remarks
<p>Reproduction, spawning and recruitment are among the physiological processes that are highly affected by environmental temperature.</p> <p>In marine fish, gonadal development, spawning, embryonic development, hatching and larval survival were severely affects at 33°C.</p> <p>Larval development and survival in mangrove crab were affected at the same temperature.</p> <p>Abalone can experience poor gonadal development, spawning, embryonic development, hatching and survival of broodstock and larvae at 31°C and 33°C</p> <p>Growth and survival of rotifers and copepods were affected by temperature, salinity and acidity caused by sudden change in weather conditions.</p> <p>Seaweeds also experienced poor growth during prolonged periods when water temperature is high together with higher incidence of diseases and epiphytic infestation.</p>	January-September 2018	

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Adopt and promote adaptive practices such as culture of fast growing species, use of larger fingerlings; use of recirculating aquaculture systems, IMTA, rice-fish culture, aquaponics, precision farming, etc.	2019	
Continue evaluating potential alternative ingredients for fish feeds	2019	
Implement zoning, monitoring, early warning systems	2019	
Promote seaweeds and mollusk farming for carbon sequestration; also mangrove reforestation	2019	
<p>Long-term plans for the program includes:</p> <ul style="list-style-type: none"> <li>- Continue basic studies on effects of climate change impacts on important aquaculture species (<i>e.g.</i> on maturation and spawning of mud crab, abalone; occurrence of diseases)</li> <li>- Breeding program/genetic improvement for climate change resilience (salinity, temperature, pH, stress, pathogen, poor water quality tolerance, disease resistance)</li> <li>- Diversification of species: breed or develop culture techniques for alternative species, especially low trophic level ones</li> </ul>		

##### 4.2 Expected Outcomes/Outputs

The program is expected to generate scientific information on the effects of high water temperature on the reproductive performance and recruitment of economically important marine aquaculture fishes. The activities aim to find solution to the following problem areas: (1) change in spawning habitats, spawning time and seed availability for aquaculture; (2) fluctuating water quality and reduced oxygen and carrying capacity affecting stocking densities and production in general; (3) changes in species' growth due to fluctuations in water parameters and increased cost of aquaculture production; (4) shortage (or inaccessibility) of fish meal for aquaculture; and (5) changing and increased susceptibility to diseases and parasites.



## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Maintaining Environmental Integrity through Responsible Aquaculture

**Responsible Department:** Aquaculture Department

**Total Duration:** 2016-2020

**Funding Sources:** AQD

**Estimated Budget for 2019:** Php 7,770,000.00

### 1. INTRODUCTION

This program was developed to address issues on the negative impacts of aquaculture on the environment and how these impacts will be minimized. It has been known that the phenomenal growth of aquaculture caused modification, destruction or complete loss of habitat; unregulated collection of wild broodstock and seeds; translocation or introduction of exotic species; loss of biodiversity; introduction of antibiotics and chemicals to the environment; discharge of aquaculture wastewater, thus caused coastal pollution; salinization of soil and water; dependence on fishmeal and fish oil as aquaculture feed ingredient, to name a few. 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.

### 2. PROJECT

#### 2.1 Goal /Overall Objectives

The goal of the program is to develop environment-based aquaculture technology by integrating environmental factors in SEAFDEC/AQD research activities and to maintain environmental integrity by promotion responsible aquaculture practices.

#### 2.2 Outcomes and Expected Outputs

- Assess impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems
- Identify appropriate extractive species that may be used in Integrated Multi-Trophic Aquaculture (IMTA)
- Develop and promote efficient and suitable environment-friendly culture systems
- Conduct biological and ecological studies on species with potentials for resource enhancement

#### 2.3 Project Description/Framework

The program will generally focus on the impacts of the aquaculture on the environment and how to minimize them. Aside from the goals that the program aims to achieve, it will also take into consideration the following issues:

Activity 1: Better management of the aquaculture sector, particularly in the use of feeds and fertilizer, antibiotics and other chemicals

Activity 2: Enabling policies to address environmental imbalance due to the destruction of habitats which leads to depletion of fish population and loss of biodiversity

Activity 3: Development of Integrated Multi-Trophic Aquaculture (IMTA) in a tropical environme

## 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018

Project/Activity Title	Duration	Remarks
<p><u>Grow-out culture of abalone in pipes</u></p> <p>A three-year study on abalone (<i>Haliotis asinina</i>) to verify a newly developed technology using pipes for grow-out culture in different areas of Panay Island is ongoing. The first site is Sicogon, to be followed by Aklan in 2019 and Antique in 2020, where 1125 abalone were successfully stocked out of 1325 transported abalone. Growth rates after 50 days were 5.72 mm mo<sup>-1</sup> and 3.62 g mo<sup>-1</sup> for shell length and body weight, respectively.</p>	January-September 2018	Ongoing
<p><u>Giant freshwater prawn culture in lake-based cages: Strategies to improve production through stock manipulation and management</u></p> <p>Strategies to improve giant freshwater prawn through stock manipulation and management is continuing until the end of the year. Advanced juveniles of <i>Macrobrachium rosenbergii</i> were stocked in 2 x 2x 1.5 m net cages in the AQD's Binangonan Freshwater Station floating cage set-up at a stocking density of 15 pieces m<sup>-2</sup>. Prawns with mean weight of 2.6 g were stocked with the following treatments: all male (AM), all female (AF), and mixed sex (MS).</p> <p>Results after four months of cage culture showed that there was significant difference in the mean weight prawns with those from AM having significantly higher mean weights (30.6 ± 3.3g) compared to both AF (21.6 ± 3.0g) and MS (25.3 ± 2.2). No significant difference was noted between the weights of AF and MS. Survival was 68% (MS), 73% (AF) and 74% (AM) with no statistically significant difference among the three treatments.</p>	January-September 2018	To finish in December 2018
<p><u>Cage culture of polychaetes in brackishwater ponds</u></p> <p>Due to the successful run last year producing polychaetes (<i>Marphysa</i>) using <i>katsa</i> (cheese cloth) cages installed in brackishwater ponds, another experiment is ongoing using two culture beds (soil surrounded by <i>katsa</i> without bottom and soil inside <i>katsa</i> cages supported by false bottom). Polychaetes trocophores cultured for three months in soil surrounded by <i>katsa</i> without bottom had better growth and survival than those reared in soil inside <i>katsa</i> cages supported by false bottom.</p> <p>Another experiment was testing on varying stocking density levels (500, 1,000, 1,500, and 2,000 per m<sup>2</sup>). As a result, polychaetes trocophores cultured in soil inside <i>katsa</i> cages supported by false bottom had higher survival at stocking density of 500/m<sup>2</sup>; growth was better at stocking density not more than 1500/m<sup>2</sup>.</p> <p>Verifying of culture methods in tanks is also being done. Using 19 grow-out tanks with each tank containing soft processed soil with a depth of 5 cm. Feeding is done once a week at 10 g of milkfish diet per tank for 5 months. Polychaetes will be harvested in the months of September and October.</p>	January-September 2018	Ongoing

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Grow-out of abalone in pipes and cage culture of polychaetes in brackishwater ponds	2019	Ongoing
Start a study on the comparison of oyster <i>Crassostrea iredalei</i> growth and survival in brackishwater pond and river using pouch	2019	Preparation is ongoing
Begin commercial production of soft-shell crabs	2019	Preparation is ongoing
Propose biodiversity studies in mariculture areas and inland waters used for aquaculture	2019-2020	No proponent yet
Bioremediation potential of seaweeds in shrimp ponds and feasibility of seaweed-shrimp polyculture	2019-2020	No proponent yet
Strengthen law enforcement and support from local government unit	2019	No proponent but identified as follow up activities
Further information, education and communication activities to all stakeholders	2019	No proponent but identified as follow up activities
Increase and enhance capacity Northern Iloilo Polytechnic State College (a local fisheries college) hatchery	2019	No proponent yet but identified as follow up activities
Consider other sites for establishment and expansion of sea ranch areas and/or nurseries.	2019	Identified areas and awaiting proposal
Production of high value crops from aquaculture effluents	2019	Identified areas and awaiting proposal
Feasibility of IMTA methods to small scale farmers in the Philippines will be established	2019	Identified areas and awaiting proposal
Training and information dissemination to address issues on Code of Conduct for Responsible Fisheries (CCRF) will be updated and conducted	2019	Identified areas and awaiting proposal
AQD operations and collaborating farms regarding compliance with CCRF-Aquaculture will be assessed	2019	Identified areas and awaiting proposal
Compliance of farms in SEAFDEC Member Countries with CCRF will be assessed	2019	Identified areas and awaiting proposal

##### 4.2 Expected Outcomes/Outputs

Development and promotion of efficient and suitable environment-friendly culture systems for various commodities are being undertaken under MEITRA. It focuses on abalone, giant freshwater prawn, polychaetes, and other finfish, crustacean, mollusks, and seaweeds.

## 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, JAIF, and Global Seaweed Star

**Estimated Budget for 2019:** Php 8,115,000

### 1. INTRODUCTION

Growth in aquaculture in the region is driven by scientific and technological breakthroughs developed in the region, and the adoption of these culture technologies among receptive entrepreneurs. However, the development of aquaculture in the region has brought and caused a number of unintended problematic scenarios, such as the following: (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. However, the present and future role of aquaculture in the regional offer optimism as its population is projected to remain as fish-eating as Asia consumed more than two-thirds (106 million tonnes at 24.0 kg per capita) of the world's fish production.

### 2. PROJECT

#### 2.1 Goal /Overall Objectives

The goal of the program is to develop and implement social and economic strategies in aquaculture and resource management to secure food and income through stakeholder collaboration.

#### 2.2 Outcomes and Expected Outputs

- 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;
- 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
- 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.

#### 2.3 Project Description/Framework

In response to the persistent and emerging social and economic issues in aquaculture in Southeast Asia, the R&D activities of this program intend to address the four categories of problems discussed and adopted for development of action plans during ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020, held last June 2011. These issues define the scope and coverage of this program as follows:

- Activity 1: Enhancing the role aquaculture in addressing food, income and livelihood security through improved governance, multi-agency collaboration, and comprehensive and inter-disciplinary approaches;
- Activity 2: Promoting sustainable aquaculture through enabling policies that support the management of natural and environmental resources;
- Activity 3: Enabling mechanisms, institutions and infrastructure to encourage adoption of better aquaculture practices;

- Activity 4: Understanding and improving linkages from production to marketing and trade of fishery products to support small and medium enterprise (SME) development; and
- Activity 5: Strengthening the capacity of aquaculture stakeholders by mainstreaming specific rural and peri-urban aquaculture programs and policies in local, national, and international development programs.

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018

Project/Activity Title	Duration	Remarks
<p><u>Assessment of Anguillid eel nursery industry in the Philippines and selected Southeast Asian countries</u></p> <p>Due to the demand of eels seeds for aquaculture in recent years, survey of anguillid eel aquaculture industry with focus on glass eel nursery is included in AQD's programs. Problems with species identification of glass eels, presence of diseases <i>e.g.</i> gas bubble disease, fungal and bacterial infection, illegal trade of glass eels, and cost of feeds resulted from the survey. Future policies are to be recommended including changing of legal export size (150 g size instead of 15 cm elvers), mandatory registration of eel farms, and implementation of eel fishery and culture policies in other ASEAN Member States.</p>	<p>January-September 2018</p>	<p>Ongoing</p>
<p><u>Economic benefits and losses of seaweed farmers in Guimaras, Philippines, due to some climate change indicators</u></p> <p>By using climate change indicators, economic benefits and losses in seaweed farming in Guimaras was studied. Incidents of seaweed diseases were mapped and correlated by seasons (dry-hot and wet-cold). During dry and hot seasons, diseases <i>e.g.</i> epiphytes and ice-ice occurred. Salinity and temperature readings in both deep and shallow area of the testing site. Both deep and shallow area has the same salinity (average of 33-36 ppt) which is too high based on FAO standard (24-34 ppt). Temperature readings varied, the deep area has an average sea surface temperature (SST) of 27°C-30°C while the shallow end recorded an average of 26°C-30°C. The threshold SST is between 25°C-30°C.</p>	<p>January-September 2018</p>	<p>To finish in December 2018</p>
<p><u>Safeguarding the Future of the Seaweed Industry of the Philippines: Socio-economic resilience</u></p> <p>Seaweed (<i>Kappaphycus alvarezii</i>) farming has become a significant source of income for migrants and those displaced by war especially in Zamboanga City and Tawi-tawi. A project under GlobalSeaweedSTAR aims to view the current and potential contribution of the seaweed industry to poverty reduction, and sustainable and resilient economic growth. The researchers under the project undergone profession and academic skills training related to seaweed aquaculture from January to June. Activities for June and December includes the finalization of data collection protocol <i>e.g.</i> formulation of interview guides and pilot testing of tools in top seaweed-producing areas in the Philippines including Zamboanga City, Tawi-tawi and Bohol.</p>	<p>January-September 2018</p>	<p>Ongoing</p>
<p><u>Community-managed Small-holder IMTA Milkfish Mariculture and Value-adding in Guimaras, Philippines</u></p> <p>The program established collaboration and linkages with local and fisherfolk association in Guimaras. The tri-party collaboration between organized fisherfolk, the local government and SEAFDEC/AQD, successfully demonstrated, promoted and achieved the social and economic objectives for the IMTA set-up in Guimaras. This project aims to enable local stakeholders to manage</p>	<p>January-September 2018</p>	<p>Ongoing</p>

Project/Activity Title	Duration	Remarks
the IMTA set-up and prepare the fisherfolks to independently continue the aquaculture operations upon end of the project.  Socioeconomics survey was conducted to assess the status of fisherfolks in terms of Sustainable Livelihood Asset Framework. Six runs of stocks and harvests and cost-and-profit are being conducted and are subject for comparison.		

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
For anguillid eels, study will continue and aims to apply possible policies identified following the survey	2019	
A model estimation of the technical economic efficiency of IMTA in small-holder milkfish mariculture in the Philippines will be conducted followed by an IMTA post-project assessment	2019	
A study on establishing small-scale aquaculture livelihoods (sustaining supply of tilapia breeders in inland production areas in Panay) will be conducted	2019	
Update economic analysis of various production systems (broodstock maintenance and larval production, fry and fingerling production, grow-out), including new culture species such as sandfish	2019	
A study on aquaculture adoption pathway and market potential of pompano will be conducted to develop new livelihood options through aquaculture of high-value indigenous species	2019	
A collaborative stock enhancement of <i>P. monodon</i> in New Washington Estuary will be conducted in partnership between SEAFDEC/AQD, Aklan State University, LGU and BFAR Region VI to enhance the role of aquaculture in securing food and fishing livelihoods	2019	

##### 4.2 Expected Outcomes/Outputs

Results from the survey on anguillid eel aquaculture industry under this program are essential in the recommendation of policies including changing legal export sizes of elvers, mandatory registration of eel farms, and implementation of eel fishery and culture policies in the Philippines and other ASEAN Member States. As for seaweeds, collaboration with the local community will be done to explore the possibility of seaweed farming as a significant source of income for migrants and those displaced by war especially in Zamboanga City and Tawi-tawi in the Philippines. Through these activities, the goal of prioritizing collaborative research and development in aquaculture in the region to have a clear regional assessment and understand of the role of aquaculture in poverty alleviation can be achieved.

The program also addressed the emerging issues on the impacts of climate change by studying the economic benefits and losses of seaweed farming and its correlation by seasons in Guimaras, Philippines.

This project aims to enable local stakeholders to manage the IMTA set-up and prepare the fisherfolk to independently continue the aquaculture operations upon end of the project through multi-agency collaboration and information sharing.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Priority and Special Projects  
**Responsible Department:** Aquaculture Department  
**Total Duration:** 2016-2020  
**Funding Sources:** AQD and Bureau of Fisheries and Aquatic Resources (BFAR)  
**Estimated Budget for 2019:** -

### 1. INTRODUCTION

Over the years, SEAFDEC/AQD has developed technologies in broodstock development, seed production and grow-out of economically-important finfishes, crustaceans, mollusks and seaweeds in various stages of development. Several of these technologies already been successfully 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.

In order to accelerate fish production and export revenues from the aquaculture sector, SEAFDEC/AQD is committed to intensify technology-transfer of matured aquaculture technologies to stakeholders which will provide additional and alternative livelihood to fisherfolk through sustainable aquaculture technologies that are economically viable, environment friendly and socially-equitable.

Collaborative projects (mostly with Bureau of Fisheries and Aquatic Resources) is being conducted.

### 2. PROJECT

#### 2.1 Goal /Overall Objectives

Streamline SEAFDEC/AQD research and development program to focus more on enhanced technology-transfer of mature technologies for food security and poverty alleviation

Outcomes and Expected Outputs

- 1) Formulate and produce low-cost but quality feed and practical fish diets for marginal fish farmers
- 2) Enhance biosecurity for hatchery and grow-out operations of black tiger shrimp and other commercially-viable species
- 3) Enhance technology-transfer program on commercially viable species in collaboration with government agencies and SEAFDEC Member Countries
- 4) Develop critical mass of aquaculturists
- 5) Intensify publications of aquaculture extension manuals to cater to the needs of the industry

#### 2.2 Project Description/Framework

Activity 1: Oplan Balik Sugpo

A program focuses on the reviving the production of black tiger shrimp (*Penaeus monodon*) with enhanced biosecurity in hatchery and grow-out operations

Activity 2: Multi-species Finfish Hatchery

Step-up fisheries production in the country, the BFAR tapped SEAFDEC/AQD to conduct surveys and prepare development plans for the establishment of 15 multi-species fish hatcheries in seven provinces around the Philippines.

Activity 3: Low-cost feed formulations

Formulate and produce low-cost and quality feed for milkfish

Activity 4: Biosecurity of hatchery and ponds

Implement proper biosecurity measures to prevent occurrence and spread of diseases

Activity 5: Manpower development

Enhance the capacity of aquaculture and fisheries graduates on various aquaculture technologies and enable them to become better fisheries and aquaculture managers, local government officers, non-government personnel

**3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018**

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
<p><u>Oplan Balik Sugpo</u></p> <p>Following its launching in 2017, Oplan Balik Sugpo activities to revive the production of black tiger shrimp had commenced.</p> <p>Shrimp Hatchery Complex and Spawner and Broodstock Facility were established at AQD's Tigbauan Main Station to cater to the production of shrimp. The hatchery operations already produced quality and pathogen-free fry.</p> <p>Demonstration for grow-out techniques for shrimp in ponds is ongoing at AQD's Dumangas Brackishwater Station.</p>	January – September 2018	Ongoing
<p><u>SEAFDEC/AQD and BFAR Establishment of Multi-Species Fish Hatcheries</u></p> <p>SEAFDEC/AQD conducted the site assessments on all legislated hatcheries around the country to find only 10 of 15 sites that are feasible for the establishment of multi-species hatcheries. However, these sites still have problems and are subject to recommended repairs and improvements. Out of the 10 sites, only three have progressed to near completion of the recommended actions.</p>	January – September 2018	Ongoing
<p><u>Low-cost feed formulations</u></p> <p>First round of low-cost feeds for milkfish had been formulated. Compared to the commercial feeds (Php 31/kg) and poultry BP (Php 45/kg), the price of the low-cost feed (Php 22.05/kg) is lower. However, distiller's dried grains with solubles (DDGS) is still the lowest at Php 19/kg.</p> <p>There's no significant difference between commercial feeds and the low-cost diet on performance based body weight and survival.</p>	January – September 2018	Ongoing
<p><u>Biosecurity of hatchery and ponds</u></p> <p>To prevent the occurrence and spread of diseases, proper biosecurity measures are implemented in SEAFDEC/AQD's hatchery and ponds. Biosecurity fences, bird scare, crab fence, and tire bath had been installed and constructed. Stocks in ponds are also monitored regularly by the disease-diagnostic laboratory.</p>	January – September 2018	Ongoing
<p><u>Manpower Development</u></p> <p>An internship training on aquaculture technologies was conducted by SEAFDEC/AQD together with its Training Section. Sixteen trainees successfully finished the course and are now part of SEAFDEC/AQD's roster of aquaculturists to carry our technical activities of new and upcoming projects</p>	March – May 2018	Done



#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
A partnership between BFAR and SEAFDEC/AQD on the establishment of feedmill plant for low-cost broodstock diets of commercially-viable finfishes and crustaceans is under review.	2019	
Continuation of activities under the Joint Mission for Accelerated Nationwide Technology Transfer Program for Aquaculture (JMAN TPP II) to promote sustainable hatchery and grow-out technologies for fishfish, crustacean, mollusks and seaweeds	2019	
Continuation of activities under the agreement between BFAR and SEAFDEC/AQD for the establishment of legislated multi-species hatcheries	2019	
Another internship training on manpower development will be conducted	2019	
Encourage researchers to publish helpful information materials for stakeholders	2019	

##### 4.2 Expected Outcomes/Outputs

The abovementioned activities can hasten the transfer of technology from demonstration sites to the fish farmers and the industry. Technology verification activities by field-testing culture systems will be intensified and its economic and commercial viabilities will be determined. Productive and profitable technologies will then be packaged and disseminated to the Philippines (through Department of Agriculture-Bureau of Fisheries and Aquatic Resources) and the Southeast Asian Region (through SEAFDEC Member Countries).

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITY FOR THE YEAR 2018-2019:  
TRAINING DEPARTMENT**

Programs/Projects	Responsible Department
<b>Project Activities Implemented in the Year 2018</b>	
1. Promotion on Strengthening of SEAFDEC Visibility and Image	TD
2. Tailor-made Training Programs	TD
3. Improvement of Fisheries Technology and Reduction of the Impact from Fishing	TD
<b>Proposed Project Activities for the Year 2019</b>	
1. Promotion on Strengthening of SEAFDEC Visibility and Enhancing Human Capacity Building	TD
2. Improvement of Fisheries Technology and Reduction of the Impact from Fishing	TD

**Overall Review  
of the Departmental Program Implementation in the Year 2018**

**TRAINING DEPARTMENT**

**1. Promotion on strengthening of SEAFDEC visibility and image**

The fisheries information through SEAFDEC role and TD implementation activities was imparted to public via four national and an international exhibitions. More than 150,000 audiences visited TD booths in totally. Two issues of Advance Fisheries Technology in theme of “Ship Technology for the Future”, and “Underwater Vehicle for Oceanography”, were produced and distributed about 4,000 copies to TD networks and the public by mail and e-mail. In the activities of management information system, the project collaboration with the Secretariat developed database system for managing overall SEAFDEC programs. Otherwise, capacity building for SEAFDEC staff for develop her skill for apply to information work were enhanced via relevant training course and annual SEAFDEC seminar.

**2. Tailor-made Training Programs**

More than 60 participants were attended in three tailors-made training courses, based on the need and requirement from the partners. The programs were 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 to build up human capacity on the fisheries related.

**3. Improvement of Fisheries Technology and Reduction of the Impact from Fishing**

Seven sub-activities from three main activities as promotion of appropriate technologies and practices of fishing marine engineering, fisheries research, and database for fisheries management were conducted to transfer appropriate technologies and practices to support sustainable utilization of coastal and marine fisheries resources, including capture fishery, marine engineering, and fishery information, and strengthen collaboration with relevant agencies at national and regional level

**SEAFDEC Departmental Programs of Activity  
For The Year 2018-2019**

**TRAINING DEPARTMENT**

**1. Overall Review**

In 2018, TD conducted three projects under Departmental program. The project of Promotion on strengthening of SEAFDEC visibility and image was implemented to strengthen and encourage TD and SEAFDEC visibility to public. Imparting knowledge of fisheries information through SEAFDEC role to public is main output by conducted exhibition, AFT magazines. Moreover, the electronic files of AFT magazine and other information were produced and distributed to TD network by this channel. In 2019, the project is continued, The project title will be changed to "*Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building*". Understanding on SEAFDEC / Departments role and activities, delivery of fisheries information and enhance knowledge through capacity building of fisheries issues to stakeholders and the public, tools and management information system of organization are expected output of this project implementation.

The project of Tailor-made Training Program was organized three tailors-made training programs, based on the need and requirement from the partners to develop of human capacity building of partner and also Member Countries. According to this, the tailor-made training programs will be continued to conduct, 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 totally new topics and programs. The organization or course fee will be estimated base on the cost recovery and actual expenses

Moreover, the project of Improvement of Fisheries Technology and Reduction of the Impact from Fishing was conducted. The main activities are promotion of appropriate technologies and practices of fishing marine engineering, fisheries research, and database for fisheries management. The outcomes and expected outputs is technology transfer and development through enhancement of strengthening on coordination and collaboration with other relevant agencies on the issues related to fishing technology, marine engineering, fisheries information and database. In 2019, ten sub-activities under three main activities will be conducted.

**2. List of Projects**

1. Promotion of strengthening of SEAFDEC visibility and image
2. Tailor-made Training Programs
3. Improvement of Fisheries Technology and Reduction of the Impact from Fishing

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Promotion on Strengthening of SEAFDEC Visibility and Image  
**Responsible Department:** Training Department  
**Total Duration:** 2019  
**Funding Sources:** Training Department  
**Estimated Budget for 2019:** 87,000 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.

Moreover, the Plan of Action on Sustainable Fisheries for Food Security Towards 2020 which was adopted in ASEAN-SEAFDEC Conference, “Fish for the People 2020” and “Adaptation to a Changing Environment” in Bangkok, Thailand during 13-17 June 2011 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 2020 through promotion of SEAFDEC role, implementation activities, visibility and image to Member Countries, other international institutions and the public, TD will propose and implement the project of “Promotion on strengthening of SEAFDEC visibility and image” under Departmental program.

### 2. PROJECT

#### 2.1 Goal /Overall Objectives

SEAFDEC role, responsibility, visibility and image are promoted and enhanced among Member Countries, others international institutions and the public

#### 2.2 Outcomes and Expected Outputs

##### Outcomes

- Strengthening of SEAFDEC and Departments visibility and image
- Building up human capacity on the fisheries related issues

##### Expected Outputs

- Understanding on 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

#### 2.3 Project Description/Framework

Activity 1: Promotion and Enhancement of SEAFDEC Visibility and Image

SEAFDEC role and implementing activities as knowledge on fisheries information in collaboration with other SEAFDEC Departments will be promoted and enhanced among others 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 SEAFDEC Department such as to develop database and management information system which support SEAFDEC's project. 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 program with outside institutions such as strategy of Public Relation, website design, *etc.* Moreover, skill of writing and present on research activities for SEAFDEC staff will be developed and enhanced via annual SEAFDEC seminar.

##### *For fishery stakeholder and public*

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 totally new topics and programs.

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018

Project Activity Title	Duration	Remarks
1) Promotion and Enhancement of SEAFDEC Visibility and Image - Exhibition on Fishery Resource Conservation and promotion SEAFDEC and TD activities for Children Day at Pomprachunlajomklao Navy was organized.	14 Jan 17	
- Exhibition in marine science seminar at Chonburi Province, Eastern part of Thailand. The theme of exhibition, TD presented collaboration activities on research survey in Antarctic by TR/V Umitaka Maru. A research staff from TD joined in this research survey. The physical and biological oceanography surveys were conducted in the Antarctic Ocean. Moreover, the promotion of organization was also conducted through dissemination of SEAFDEC technical document, magazine and so on.	18-20 Jun 18	
- Exhibition at the annual national fair "Pramong Nomklao" was organized in collaboration with the Thai Department of Fisheries. TD presented the "Fish Enhancing Devices (FEDs) for Fisheries Resources Conservation" as a research project which was conducted and promoted by TD. In this regard, the model of FEDs was 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.	29 June-8 July 18	

Project Activity Title	Duration	Remarks
- Special event on SEAFDEC Mini-marathon and promotion of SEAFDEC visibility	Will be organized on 16 Dec 18	
2) Production of Information Materials - Two issue of Advance Fisheries Technology in theme of “Development of fishing vessel for the future”, and “Sustainable in aquaculture”, 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.	Jan and May 18	
3) Management Information System - Maintenance and update TD website and integration website	Jan-Dec 18	
- Development of TD repository	Jan-Dec 18	
4) Human capacity building - Annual SEAFDEC seminar to development and enhancement skill of writing and presentation on research activities for SEAFDEC staff.	Will be organized in 19 Dec 18	

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

In 2019, this project title will be changed to “*Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building*”.

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1: Promotion and Enhancement of SEAFDEC Visibility and Image  National and international exhibitions as required will be organized to promote and enhance SEAFDEC role, visibility and image through present knowledge on fisheries information in collaboration with other SEAFDEC Departments.	Jan-Dec	
Activity 2: Production of Information Materials  - Three issues of Advance Fisheries Technology (AFT). - Fisheries information package to promote awareness understanding for fishermen, stakeholder and public will be produced. The package will include books, brochures, CD-ROM, etc.	Jan-Dec	
Activity 3: Management Information System  The Training Department will cooperate with SEAFDEC Department such as to develop database and management information system which support SEAFDEC’s project. 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.	Jan-Dec	
Activity 4: Enhancing on human capacity building  - 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, etc. Moreover, skill of writing and present on research activities for SEAFDEC staff will be developed and enhanced via annual SEAFDEC seminar. - 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	Jan-Dec	

Project/Activity Title	Duration	Remarks
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 totally new topics and programs.		

#### 4.2 Expected Outcomes/Outputs

- Strengthening of SEAFDEC and Departments visibility and image
- Understanding on role and SEAFDEC / Departments activities of public
- Delivery and enhance knowledge through capacity building of fisheries issues to stakeholder and public



## **PROJECT DOCUMENT**

**Program Categories:** Departmental Programs  
**Project Title:** Tailor-made Training Programs  
**Responsible Department:** Training Department  
**Total Duration:** 1 year (2019)  
**Funding Sources:** Training Department  
**Estimated Budget for 2019:** -

### **1. INTRODUCTION/BACKGROUND**

In each year TD has conducted several regional training courses, that are a channel to transfer activities outcomes and technology which are found out or developed by SEAFDEC to its Member Countries, therefore the participants will come home with knowledge about “how they learn and how they do in SEAFDEC/TD, Thailand”. However continuously, in every year SEAFDEC/TD has requested to conduct some tailor made courses and study tour programs that are a direct follow-up of its advisory activities with and for, organizations in this region. Such courses/programs are referred to as tailor-made courses/programs because they are set up at the request and need of the organizations, with this they can be enormous benefit in developing the capabilities of the workforce, training doesn’t come cheaply. Training needs to be for the right people, it needs to be the right type/design of training and it needs to be at the right time. Due to this the participants background, work responsibilities, objectives and expectation to be able to do at the end of the training course/program will be used for the course designing, it is tailored to the specific training needs of the requesting organization's staff. The tailor-made training courses and study tour programs which are conducted by TD emphasize learning by doing, observing. This is an approach that relies heavily on the participants' active involvement. An important part of learning by doing and seeing are that lecturers act more often as facilitators than as teachers in the traditional sense. The course will not focus on the theory but more dealing with practical application.

### **2. PROJECT**

#### **2.1 Goal/Overall Objectives**

This project goal is to continue in giving support to the interested of SEAFDEC Member Countries and others for strengthening the capability of the training partners’ target participants which will be directly meet to their own specific need and required of the technical areas in related to the fisheries. Moreover, the specific objectives of the project are as following:

1. Wide range of tailor-made training courses in the field of fisheries and other relevance aspects will be continued to support by TD.
2. Training facilities of TD will be fully utilized and made use for member countries and the region.

#### **2.2 Outcomes and Expected Outputs**

TD will continuously be a part to support Member Countries or other organizations/institutes to build up human capacity on the fisheries related issues especially base on the need and requirement aspects of the training partners/donors.

#### **2.3 Project Description/Framework**

The tailor-made training courses and study tour programs will be conducted based on the need and requirement from the partners. 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 totally new topics and programs. The organization or course fee will be estimated base on the cost recovery and actual expenses.

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018

#### 3.1 Activities Achievements in the Year 2018

Achievements based on Activities	Duration	Remarks
1. The Training Course on Safety at Sea and Convention C 188. This training course was conducted at Pattani Province, Thailand in collaboration with DOF, Thailand and partners which introduce information on safety at sea and convention C188 to fishermen.	3 February	
2. The Training on Capacity Building of Thai Crew for Fishing Vessels. This training was conducted in collaboration with National Farmer Council, Department of Fisheries, Thai Fisheries Association, Ministry of Labor, Marine Department, Internal Security Affairs Bureau and Naval Operations Department. There were fifteen (15) participants who are Thai Agriculturist. The training was aimed at developing capacity and skill on fishing activities of participants to better understand on fishing operation and can be crew on fishing vessels. Furthermore, the training focused on fishing gear and operation, safety at sea, fishery and labor law. Moreover, the participants had a chance to practice on fishing operation at sea.	11 March – 2 April	
3. The Short-term Training Course for University Students on Ecosystem Approach to Fisheries Management" (Batch-61). The training course was conducted at SEAFDEC/TD, there were 26 students from eight difference Universities attended in the training course.	11 days 12-22 June	

#### 4. PROPOSED ACTIVITIES FOR THE YEAR 2019

Since next year, the activities under this project will be integrated and conducted under the project of *"Promotion on strengthening of SEAFDEC visibility and enhancing human capacity building"*

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Improving of Fisheries Technology and Reduction of the Impact from Fishing

**Responsible Department:** Training Department (TD)

**Total Duration:** 2019-2020

**Funding Sources:** Department of Fisheries, Thailand

**Estimated Budget for 2019:** -

### 1. INTRODUCTION

Over the years, TD has initiated several projects/programs aiming to promote responsible fishing technology and practices, including reduction of the impact from fishing through improvement of onboard current fishing practice; develop deck machineries; and conduct practical research on fishing technology and fisheries marine engineering. This program covers a wide range of activities, implemented in collaboration with the Department of Fisheries-Thailand and other government agencies (*e.g.* Fish Marketing Organization of Thailand, Fisheries Academies, Institutes and Universities). 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, however the titles of main components of activities are slightly adapted with regard to the present fisheries situation. Three (3) main components are listed as below;

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 to marine ecosystem; and
3. Development of database to support the fisheries management for Thailand

### 2. PROJECT

#### 2.1 Goal/Overall Objectives

- 2.1.1 Application of the multidisciplinary research on fisheries resource, fisheries environment, fishing technology and socioeconomic to mitigate impact of fisheries to marine ecosystem;
- 2.1.2 Dissemination of the appropriate technologies and practices to support sustainable utilization of coastal and marine fisheries resources including capture fisheries, marine engineering, and fishery information system;
- 2.1.3 Strengthening the collaboration with relevant national, regional, and international agencies.

#### 2.2 Outcomes and Expected Outputs

Through the technology transfer and development, it is envisaged that capture process will be improved. In addition, coordination and collaboration with other relevant agencies on the issues related to fishing technology, marine engineering, fisheries information and database will also be strengthened.

#### 2.3 Project Description/Framework

**Activity 1:** Promotion of appropriate technologies and practices of fishing and marine engineering to enhance sustainable marine fisheries resource utilization

Series of activities have been focused on the promotion on appropriate technology and practices of fishing and marine engineering. Activities on energy saving in fishing emphasized on fishing gear design and standard energy auditing for shrimp trawlers in the Gulf of Thailand. The outputs include comprehensive

scientific report of the result from the field test onboard trawlers. In order to investigate the impact of fishing gear and underwater structure of fishing gear, by-catch observation, productivity and quality of catch, sub-project activity, Remotely Observation Vehicle and Underwater camera system for fishing operation observation has been proposed and introduced to perform and overcome a limited scope of study in partnership with relevant institutes and agencies. SEAFDEC/TD in collaboration with the Department of Fisheries-Thailand, and Fish Marketing Organization-Thailand has finished carrying out the improvement of fishing port facilities in Rayong Province, eastern part of the Gulf of Thailand and Bangkok Fishing Port.

There are three (3) sub-activities under this program as follows;

- 1.1 Study on improvement of fishing technology to sustain marine fisheries resource utilization
- 1.2 Support on the fisheries resource enhancement program and management program under Department of Fisheries and Department of Marine and Coastal Resources
- 1.3 Improve references for fishing technology
  - a) Human resources development programs and improve the training materials of fishing technology subject for staffs of the Department of Fisheries and undergraduate students of Thailand
  - b) Improve references for fishing gear marking for Department of Fisheries
  - c) Support monitoring and survey on fishing technology to support Fisheries Management of Thailand and other specific purposes

**Activity 2:** Fisheries research on impact of fishing to marine ecosystem

This program has been focused on impact of fishing practices to marine ecosystem. Activities have been jointly implemented by SEAFDEC/TD, Department of Fisheries-Thailand and relevant institute and agencies *e.g.* RIHN (Research Institute for Humanity and Nature, Japan), and Department of Marine Technology of Burapha University, aiming to monitor the change of bottom sediment around the Rayong Set Net Pilot Project area (terminated) and monitoring discards and garbage in small-scale gillnet fisheries operating in the coastal area of Rayong province, Thailand. There are 2 (two) Sub-activities under this program as follows;

- 2.1. Compilation on the environmental impact information from fishing operation
- 2.2. Study on bycatch and discards from fishing operation

**Activity 3:** Database for fisheries management

SEAFDEC/TD in collaboration with the Department of Fisheries-Thailand has developed database system for managing data collected and obtained from the cruise resource surveys. The activities aim to harmonize data collection for the research cruise survey on fisheries resources between DFTRDI (Deep Sea Fisheries Technology Research and Development Institute) of Department of Fisheries-Thailand and SEAFDEC/TD. Since 2013, a series of workshop to develop a manual for data collection of the fisheries resources survey onboard research vessels (R/V Chulabhorn, R/V Mahidol, M.V. SEAFDEC, and M.V. SEAFDEC2) has been organized continuously. SEAFDEC/TD in collaboration with Department of Fisheries-Thailand has verified the systematic data collection, data storage, management and sharing in order to improve national database collection from the cruise survey of their national research vessels for future data compilation.

- 3.1. Development of database system for management of data from the cruise surveys

**3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018**

Project/Activity Title	Output	Remarks
1. Follow up the dog conch resource management in Krabi province, Thailand	Updated status of dog conch resource and management/conservation measures in Krabi province	Working in collaboration with the DoF-Thailand, EnLife Foundation and the Electricity Generating

		Authority of Thailand (EGAT) and local fishers
2. Follow up the coastal fisheries management by local community of Thailand		
3. Human Resources Development and improve the training material of fishing technology subject for staffs of the Department of Fisheries and undergraduate student of Thailand	Production of training materials for fishing technology subject for staffs of the Department of Fisheries and undergraduate student of Thailand	
4. Improve reference for fishing gear marking for Department of Fisheries-Thailand	Presentation of references for fishing gear marking for Department of Thailand	
5. Compilation on the environmental impact from fishing operation	Presentation of references for environmental impact from fishing operation	
6. Support fisheries research survey in the Gulf of Thailand and the Andaman Sea	Conduct of resources survey in the Gulf of Thailand and Andaman Sea	
7. Development of database system for management of data from the cruise surveys	On-going	

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

##### Project Description/Framework

**Activity 1:** Promotion of appropriate technologies and practices of fishing and marine engineering to enhance sustainable marine fisheries resource utilization

- 1.1 Study on improvement of fishing technology to sustain marine fisheries resource utilization
- 1.2 Support the research on coastal fishing activities, *e.g.* set net, bamboo stake trap, for specific proposes, *e.g.* fish sampling
- 1.3 Advanced sustainable technology: Development and improvement of Remotely Observation Vehicle and Underwater camera system for fishing operation observation
- 1.4 Improve facilities for fishing ports
- 1.5 Improve references for fishing technology
  - a) Human resources development programs and course curriculum of fishing technology subject for staffs of the Department of Fisheries and undergraduate student of Thailand
  - b) Improve reference for fishing technology subject for undergraduate student of Thailand
  - c) Support monitoring and survey on fishing technology to support Fisheries Management of Thailand and other specific purposes

**Activity 2:** Fisheries research on impact of fishing to marine ecosystem

- 2.1 Research and study on the status and impact of fisheries oceanography and marine environmental from fishing operation
- 2.2 Research and study on by-catch and discards from fishing operation
- 2.3 Research and study on fisheries resource enhancement in in coastal area of Thailand

**Activity 3:** Database for fisheries management

- 3.1 Development of database system for fisheries resources survey
- 3.2 Development of database system to support fisheries socio-economic study

**Planning of the Project Activities for 2019**

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
<p>Activity 1: Promotion of appropriate technologies and practices of fishing and marine engineering</p> <p>1.1 Study on improvement of fishing technology to enhance sustainable marine fisheries resource utilization (Improve purse seine fishing of Thailand)</p> <p>1.2 Research on coastal fishing activities, <i>e.g.</i> set net, bamboo stake trap, for specific proposes, <i>e.g.</i> fish sampling</p> <p>1.3 Advanced sustainable technology: Remotely Observation Vehicle and Underwater camera system for fishing operation observation</p> <p>1.4 Improve facilities of the fishing ports in collaboration with DoF and FMO, Thailand</p> <p>1.5 Improve references for fishing technology</p> <p>a) Human resources development programs and improve the course curriculum of fishing technology subject for staffs of the Department of Fisheries and undergraduate student of Thailand</p> <p>b) Improve references for fishing technology subject for undergraduate student of Thailand</p> <p>c) Support monitoring and survey on fishing technology to support fisheries management of Thailand and other specific purpose</p>	Jan-Dec 2019	<p>Waiting for request from DoF</p> <p>Waiting for the 2<sup>nd</sup> Memorandum of Understanding</p> <p>Waiting for request from DoF</p>
<p>Activity 2: Study on the impact on fisheries resources, marine environmental, social well-being and livelihood from fishing activities</p> <p>2.1 Research and study on the status and impact of fisheries oceanography and marine environment from fishing operation</p> <p>2.2 Research and study on impact of social well-being and livelihood from fishing activities</p>	Jan - Dec 2019	
<p><b>Activity 3:</b> Database for fisheries management</p> <p>3.1 Development of database system for fisheries resources survey</p> <p>3.2 Development of database system to support fisheries socio-economic and small-scale fisheries study</p>	Jan - Dec 2019	

**Expected Outcomes/Outputs**

1. Study report on feasibility to improve deck machinery for fisheries installed in Thai fishing vessels, socioeconomic and fishing technology perspective
2. Improved curriculum and activity report on human resources development on specific detail of Fisheries Management for DoF officers
3. Documents as references for fishing technology for undergraduate students of Thailand
4. Developed and updated database system as a result of the fisheries resources surveys to support fisheries management plan
5. Developed database system to support research on the fisheries socio-economic and small-scale fisheries
6. Study report on the status and impact of fisheries oceanography and marine environment from fishing operation
7. Study report on the impact of social well-being and livelihood from fishing activities

## Project Document

**Program Categories:** Departmental Programs

**Project Title:** Collaboration research between JRCAS and SEAFDEC/MFRDMD

**Responsible Department:** SEAFDEC/MFRDMD

**Total Duration:** 2019 – 2020 (2 years)

**Funding Sources:** JIRCAS and MFRDMD

**Estimated Budget for 2019:** 50,000 USD

### 1. Introduction

The Japan International Research Center for Agricultural Sciences (JIRCAS) was established in October 1993, through the reorganization of its predecessor, the Tropical Agriculture Research Center (TARC), in order to include overseas forestry and fisheries research in its mandate. It was again restructured in April, 2001 as an Incorporated Administrative Agency under the Ministry of Agriculture, Forestry and Fisheries (MAFF). On 13 August 2018, a team members from JIRCAS lead by Dr Osamu Abe has visited SEAFDEC/MFRDMD, just to introduce JIRCAS ongoing and future activities related to agriculture sector including fisheries matters. So far JIRCAS already established collaboration with the Fisheries Research Institute in Penang, Malaysia however mainly focus on survival and growth of blood cockle on the west coast of Peninsular Malaysia. After a brief discussion, SEAFDEC/MFRDMD is interested to establish collaboration work with JIRCAS in matter related to livelihood of coastal community due to monsoon season, normally occur annually in November to February in the east coast of Peninsular Malaysia.

### 2. Objectives

This collaboration project has specific objectives as follows;

- Understanding coastal community requirements during monsoon season
- Introduce alternative livelihoods that are environmental friendly and profitable
- Establish mechanism for self-evaluation

### 3. Project Duration

This project will spend for 2 years, starting in October 2019 to September 2021

### 4. Project activities

- Profiling of coastal communities affected by monsoon
- Analyses on coastal community needs
- Stakeholders consultations
- Pilot project testing
- Final report and publication

### 5. Expected expenditure

No	Activities	In USD	Remarks
1	Develop questionnaires and conduct surveys (4 months)	6,000	
2	Boat rental	3,000	
3	Contract services	6,000	
4	Consultation with stakeholders	20,000	
5	Testing pilot project	10,000	
6	Publication and printing	5,000	

**6. Expected outputs and Outcomes**

- Total number of fishers affected by monsoon
- Type of assistance required by coastal community
- Alternative livelihood identified and tested
- Higher living standard for coastal community

**7. Required Consideration by the 41<sup>st</sup> PCM**

- To take note on project proposal by SEAFDEC/MFRDMD,
- To provide comments and advice to the proposed project and activities in 2019 and the way forward.



**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITY FOR THE YEAR 2018-2019:  
INLAND FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT**

<b>Programs/Projects</b>	<b>Responsible Department</b>
<b>Project Activities Implemented in the year 2018</b>	
1. Stock Assessment and Fish Production Potential of Inland Fisheries	IFRDMD
2. Center of Excellence for Fisheries Management on Inland Waters	IFRDMD
<b>Proposed Project Activities for the Year 2019</b>	
1. Stock Assessment and Fish Production Potential of Inland Fisheries	IFRDMD
2. Center of Excellence for Fisheries Management on Inland Waters	IFRDMD

## **Overall Review of the Departmental Program Implementation in the Year 2018**

### **INLAND FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT**

#### **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.
4. 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. Center excellence of Indonesia for Fisheries management on Inland Fisheries**

Increasing harmonize of organization of IFRDMD and RIIFE, we have received fund from the Ministry of Research, Technology and Higher Education, Republic of Indonesia to transform our organization as a Center of Excellence in Science and Technology. Our goals is to lead research on Inland Fisheries management to support policies, produce human resources with fisheries expertise capacity, and disseminate research results related to inland fisheries. It is expected to be able to participate and contribute significantly in producing implementative research results as a solution to address the problems faced by the community at regional, national, regional and global levels, especially those related to the management of inland fisheries by adopting fisheries sustainable.

The program for the development center of excellence in science and technology is expected to increase the capacity and capability of institutions through institutional strengthening, research development, and application of science and technology, human resource development, network extending and dissemination. It is hoped it can be used as a utilization of research results in the inland fisheries management in order to increase the prosperity of coastal communities through integrated inland fisheries management/integrated inland fisheries management (IIFM). Integrated Inland Fisheries Management Program (IIFM) will be implemented through three main programs, namely:

1. Establishment of a data center for science and technology on inland fisheries in Indonesia
2. Establishing sustainable management of inland fisheries resources
3. Development and cooperation with stakeholder to make the pilot area for fisheries management on Inland fisheries.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Fish Stock Assessment and Production Potential on Inland Fisheries

**Responsible Department:** IFRDMD

**Total Duration:** 2017 - 2020

**Funding Sources:** Indonesia Government

**Estimated Budget for 2019:** USD 179,310

### 1. INTRODUCTION

The Fisheries Management Area (FMA) is Called KPP PUD in Indonesia is a management tool that is applied to specifically delineate of Inland fisheries area. Globally, FMA/KPP-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

Objective:

Establishing of Fish stocks and fish production Potential on Fisheries Management Area number 439, 438, 431, 432, 435 and 436

#### 2.2 Outcomes and Expected Outputs

Outcomes:

Fisheries management area on FMA number 439, 438, 431, 432, 435 and 436

Outputs:

Value of fish stocks, MSY, fish production potential and total catch

#### 2.3 Project Description/Framework

Activity	Description
Determined of Fish stocks and production potential of Inland Fisheries in FMA number 439	Collecting data (fish stock, MSY, fish production and total catch) on fisheries management area number 439
Determined of Fish stocks and production potential of Inland Fisheries in FMA number 438	Collecting data (fish stock, MSY, fish production and total catch) on fisheries management area number 438

<b>Activity</b>	<b>Description</b>
Determined of Fish stocks and production potential of Inland Fisheries in FMA number 431	Collecting data (fish stock, MSY, fish production and total catch) on fisheries management area number 431
Determined of Fish stocks and production potential of Inland Fisheries in FMA number 432	Collecting data (fish stock, MSY, fish production and total catch) on fisheries management area number 432
Determined of Fish stocks and production potential of Inland Fisheries in FMA number 435	Collecting data (fish stock, MSY, fish production and total catch) on fisheries management area number 435
Determined of Fish stocks and production potential of Inland Fisheries in FMA number 436	Collecting data (fish stock, MSY, fish production and total catch) on fisheries management area number 436

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
Activity 1: 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, Oct	
Activity 2: 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 438	Feb, May, Jul, Oct	
Activity 3: 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 431	Feb, May, Oct	
Activity 4: 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 432	May, July, Oct	
Activity 5: 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 435	May, July, Oct	
Activity 6: 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 436	May, July, Oct	

### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

#### 4.1 Planning of the Project Activities

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
Activity 1: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 439	Feb, May, Jul, Sep, Dec	
Activity 2: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 434	Mar, Jun, Aug, Dec	
Activity 3: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 437	Feb, Apr, Jul, Dec	
Activity 4: Determined of Fish stocks and production potential of Inland Fisheries	Mar, May, Aug, Dec	

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
in FMA number 422		
Activity 5: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 421	Feb, May, Jul, Sep, Dec	
Activity 6: Determined of Fish stocks and production potential of Inland Fisheries in FMA number 411	Mar, Jun, Sep, Dec	

#### 4.2 Expected Outcomes/Outputs

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
Activity 1	Value of fish stocks, MSY, fish production potential and total catch on FMA number 439
Activity 2	Value of fish stocks, MSY, fish production potential and total catch on FMA number 434
Activity 3	Value of fish stocks, MSY, fish production potential and total catch on FMA number 437
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 421
Activity 6	Value of fish stocks, MSY, fish production potential and total catch on FMA number 411

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Center of Excellence Science and Technology on Inland Fisheries Management

**Responsible Department:** IFRDMD

**Total Duration:** 2018 - 2021

**Funding Sources:** Indonesia Government

**Estimated Budget for 2019:** USD 29,655

### 1. INTRODUCTION

The lack of data on the status of inland fisheries is currently the responsibility of the research institution which is expected to support the sustainability of fish resources. Fisheries activities such as fish cultivation cause water pollution because they do keep the carrying capacity of the environment. The conservation area of the inland water fisheries, in terms of quality and quantity is still very lacking. Data on fisheries statistics are still not managed properly, both in terms of data collection and data analysis. Arrest activities have not taken into account the severity of sums right. The local wisdom as one way to manage fish resources has been lost. For this reason, research supporting for the management of fish resources on inland waters is needed. The research focuses on term of biology, ecology, population dynamics, environmental, fish resources, biodiversity in inland waters. There are three main pillars in fisheries management, namely fish stocks, fish passage and conservation.

Sustainable fishing is an effort to integrate social, economic and ecological goals. The concept of sustainable fisheries arises from environmental awareness. Sustainable fisheries are developed because of concerns that the ability of the aquatic environment will decline to support the availability of fish resources. The initial idea for sustainable fisheries was to be able to capture or harvest fish resources at a sustainable level, so that fish populations and production will not decline or are available from time to time. The development of science and technology in inland fisheries management area is one of our research priorities. Several performance indicators that have been carried out include the number of fisheries management areas (FMA) or called KPP-PUD, biological and habitat of fish, fish production potential, fishing capacity and scientific papers. Nevertheless, there are still some weaknesses that are still being faced in the implementation of inland fisheries management research, including:

1. Lack of funding, facilities and laboratory equipment as well as the existence of laboratories.
2. Lack of human resources, both quantity and quality which consist of researchers, engineers, and administrative personnel who can influence the achievement of targets.
3. Lack of Standard Operating Procedures (SOP) in managerial research activities that will hinder the performance of research implementation in an accountable, effective and efficient manner.
4. Incomplete updating total area of inland fisheries in Indonesia, making it difficult for the data collection process

### 2. PROJECT

#### 2.1 Goal /Overall Objectives

##### Objective

Center of Excellence science and technology on Inland Fisheries

#### 2.2 Outcomes and Expected Outputs

##### Outcomes

Establishing a center of excellence science and technology for inland fisheries management on national and international standards

##### Outputs

Fish stocks, fish passage and inland fisheries conservation area

### 2.3 Project Description/Framework

Activity	Description
Activity 1 Determined of fish stock and fish production on inland fisheries in Indonesia	Collecting data of fish stock and fish production on inland fisheries management area
Activity 2 Design of Fish Passage Design Principles by fish species	Collaborating with stakeholder and collecting data to making fish passage design in Indonesia
Activity 1 Valuation of habitat and fish for conservation area	Determined of fish habitat and location base on water quality and fish stock

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018

Project/Activity Title	Duration	Remarks
Activity 1 Value of fish stock and fish production on inland fisheries in Indonesia	Apr, Jul, Nov	
Activity 2 Collaboration and design model of fish Passage on inland fisheries.	Apr, Jul, Nov	
Activity 3 Valuation of habitat and fish for conservation area	Apr, Jul, Nov	

### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

#### a. Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1 Determined of fish stock and fish production on inland fisheries in Indonesia	Apr, Jul, Nov	
Activity 2 Scheming of fish passage design principles to enhance sustainability of inland fishery resources	Feb, Jul, Nov	
Activity 3 Establishing of conservation area base on fish stock assessment Establishing of conservation area base on fish stock assessment	Jun, Sep, Nov	

#### b. Expected Outcomes/Outputs

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	Value of fish stocks and fish production on inland fisheries in Indonesia
Activity 2	Fish passage design principles to enhance sustainability of inland fishery resources
Activity 3	Conservation area base on Fisheries management area in Indonesia

**OTHER PROGRAMS**

**PROJECT DOCUMENT**  
**ACHIEVEMENTS FOR YEAR 2018**  
**AND**  
**PROPOSED ACTIVITY FOR YEAR 2019**

			Project id: 201801010
<b>Program Categories:</b>	Other Program		
<b>Project Title:</b>	Implementing the Lower Mekong Fish Passage Initiative in Cambodia, Thailand, and Viet Nam		
<b>Lead Department:</b>	Training Department	<b>Total Duration:</b>	2018 - 2019
<b>Donor/Sponsor:</b>	USDID - DOI	<b>Total Donor Budget:</b>	USD 466,000
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	USD 357,000
<b>Project Leader:</b>	Yuttana Theparoonrat	<b>Involved Country:</b>	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 (AMSs).

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

The major project outputs include:

1. Report of fish passage barrier inventories in Cambodia, Thailand, and Viet Nam.
2. Enhance the capacity of participants on GIS approaches to fish passage barrier inventory and Engineering design and construction procedures for Low-head fish passages
3. 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.

Support Cambodia Inland Fisheries Research and Development Institute (IFRDI) and Viet Nam Directorate of Fisheries (VDOF) vehicle maintenance or rental/fuel/lodging/ DSA/field equipment, as needed. Participate in training workshops as well as 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.

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. 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. Host and provide space for a workshop between DOI, CSU, and all partner ministries on GIS Approaches to Fish Passage Barrier Inventory. 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. Respond to requests from all relevant government agencies with environmental or other permitting responsibilities and meet all relevant regulatory requirements. Provide periodic oversight of all phases of construction and report progress back to DOI and CSU. In collaboration with DOI, CSU and the fishway construction contractor, ensure compliance with technical specifications during fishway construction. Complete the three fish passes per the timelines and budget identified in Articles 5 and 6 of this Project. In collaboration with DOI and CSU, perform a hydraulic and ecological commissioning to ensure the fishway performs to desired standards. 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:

- 3.1 Engage a Project Officer to work with points of contact in all partner Ministries and any selected contractors in each nation.
- 3.2 Document project activities in SEAFDEC publications and other media.
- 3.3 Provide computing equipment and consumables as needed to Project Officer.
- 3.4 Provide financial support to the appropriate contractor to construct a model fishway for educational use.

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 \$5,000 to the appropriate contractor to construct a model fishway for educational use.

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2018

#### 3.1 Activities Achievements in the Year 2018

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	Apr. – Dec.	
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 2.2 Host and provide space for a workshop between DOI, CSU, and all partner ministries on GIS Approaches to Fish Passage Barrier Inventory.  Sub-activity 2.3 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.	6–9 November 2018, at SEAFDEC/TD  13-16 November 2018, at SEAFDEC/TD	
Activity 3: Administration and Coordination  Administrative and Information collection		

### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2019

#### 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.  Respond to requests from all relevant government agencies with environmental or other permitting responsibilities and meet all relevant regulatory requirements.  Provide periodic oversight of all phases of construction and report progress back to DOI and CSU.  In collaboration with DOI, CSU and the fishway construction contractor, ensure compliance with technical specifications during fishway construction.  Complete the three fish passes per the timelines and budget identified in Articles 5 and 6 of this Project.	Jan. – Sep.	

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
In collaboration with DOI and CSU, perform a hydraulic and ecological commissioning to ensure the fishway performs to desired standards.  Coordinate with relevant Ministries to document the final ownership and operations and maintenance plans for the fish passes.		
Activity 3: Administration and Coordination  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 for the appropriate contractor to construct a model fishway for educational use.	Jan. – Sep.	

#### 4.2 Expected Outcomes/Outputs of Activity for the year 2019

<b>Proposed Activity</b>	<b>Outputs of Activity</b>
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	Complete the three demonstration fish passage construction in Cambodia, Thailand and Viet Nam.
Activity 3: Administration and Coordination	Complete construction of a model fish-way for education use and delivery to LARReC, Lao PDR



## PIPELINE PROJECT

### Concept Note

**Project Title:** Development of Stock Assessment Method and Strengthening of Resources Management Measures on Tropical Anguillid Eels in ASEAN region.  
**Project Funding Agency:** Japan ASEAN Integration Fund  
**Lead Department:** SEAFDEC Secretariat, IFRDMD, AQD  
**Proposed budget:** 800,000 USD (pending)  
**Duration:** 2 years

#### 1. Background

Eel resources are utilized as direct human consumption worldwide in the East and Southeast Asian region, the North and Latin American region, as well as in the European region. In 2007, the European eel was listed by CITES in Appendix II for international trade due to its resource decline and the possibility of future extinction. In addition to that, in 2010, EU banned export of the European eels from its member states. These regulations are believed to cause in part a recent shift from the European eels to other eel species such as the tropical Asian eel species, the American eels, etc. to compensate the shortage of global supply of eel seeds for eel farming.

Although the demand and use of the tropical eel resources in Southeast Asia is increasing, few, if any, conservation management measures for the tropical eels has been in place in ASEAN member states (AMS), especially where the tropical eel fisheries exist, causing poor management implementation for the sustainable use, as well as the long-term persistence, of these eel species. Furthermore, a lack of information and data relevant to biology, catch history/statistics, and eel aquaculture also makes it difficult to conduct comprehensive assessment of the eel resources in Southeast Asia. These facts may prevent the tropical eels from being good candidates of the favorable target species for commercial freshwater fisheries/aquaculture with appropriate resource management.

Given the above, the ongoing 2-year project was planned and has been conducted by SEAFDEC with full cooperation of AMS to develop fisheries statistics data collection system, examine the status of tropical eel species in AMS, and improve eel aquaculture condition. Although it is still at a preliminary stage, the project achieved to conduct baseline/regular surveys that collected basic fisheries statistics data in most, if not all, Southeast Asian countries, set out policy recommendations to help AMS initiate and improve management practices in their countries, and start researches to improve survival rate of juvenile eels under aquaculture conditions.

AMS realize that it is required to make more efforts in order to complete comprehensive assessment of the status of the eel resources and to bring each country's best management procedures in reality. Although the initial fisheries statistics data collection system has been set out, it is not yet fully operated to obtain all of the required data and information, such as long-term catch data, precise distribution and diversity, and reliable trade data of each of the tropical eel species. Without these data and information, it is still difficult to estimate, for instance, allowable catch limit that is one of the key factors to secure sustainable use of tropical eel resources.

This project is proposed to strengthen the current fisheries statistics data collection system, conduct biological and ecological survey/researches on field, develop mathematical/statistical abundance estimation method, and propose appropriate management policy/measures.

#### 2. Project Description/Justification

Through the ongoing project conducted by SEAFDEC with the full cooperation of AMS, it has become evident that the operated activities are still at the initial stage. The trends of abundance, areas of distribution, and stock structure of the tropical eel species have been yet unclear, and consequently the lack of the information prevents AMS from determining the allowable catch limit of tropical eels. In order

to control and manage the eel resources for the sustainable use, and long-term persistence, of tropical eel, therefore, it is necessary for AMS to develop and improve tools/methods for the better/advanced management.

Globally, conservation and management of the eel species is currently a big issue to be addressed adequately, as seen in the case of the European eel. A lack of proper legal framework results in the failure in fisheries management. Legally binding fisheries measures specific to the tropical eels have been so far implemented only in a few ASEAN countries (Indonesia and Philippines) that restrict export of the eels at a certain size. This project will develop and proposes appropriate management measures in the Southeast Asia with full cooperation and coordination from AMS.

### **3. Objectives**

The objective of this project is to develop, improve stock assessment methods and resources management measures to secure sustainable use and conservation of tropical Anguillid eels in ASEAN region.

### **4. Intended activities to be implemented in the project**

#### Output 1

Biological, ecological, and fisheries data and information will be properly collected in order to describe the current and future stock status of the tropical eel species.

#### Activity 1

- 1.1 To Collect the data on catch and catch effort by species and by life history stage (glass eel, and elver/yellow eel) in the countries where have eel fisheries in AMS in order to properly assess stock status.
- 1.2 To conduct field surveys in order to better understand biology and ecology, including habitat and its surrounding environment, of the tropical eel species.
- 1.3 To carry out field surveys and analysis in order to understand distribution, the level of diversity, and stock structure of the tropical eel species.

#### Output 2

Analytical methods for the comprehensive stock assessment of tropical Anguillid eel will be developed, improved.

#### Activity 2

- 2.1 To analyze catch per unit fishing effort (CPUE)
- 2.2 To develop a method for estimating abundance trend of the eel stocks
- 2.3 To develop a method for estimating allowable catch limit that will secure sustainable use of tropical Anguillid eel resources

#### Output 3

Management policy and measures are proposed and formulated that will be implemented in AMS in order to secure sustainable use and long-term persistence of tropical Anguillid eel resources

#### Activity 3

- 3.1 To formulate the effective resource management measures for conservation and utilization of each of the tropical eel species
- 3.2 To develop an action plan for comprehensive resource management
- 3.3 To propose resource management policies in AMS

### **5. Progress and status**

Project proposal will be submitted to Mission of Japan to ASEAN and ASEAN Secretariat

## PIPELINE PROJECT

### Concept Note

**Project Title:** Second Phase of Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management

**Project Funding Agency:** Japan ASEAN Integration Fund

**Lead Department:** SEAFDEC/MFRDMD

**Proposed budget:** 900,000 USD

**Duration:** 5 years

#### 1. Background

The coastal areas in the Southeast Asia provide the means of livelihood to the coastal dwellers, where hundred thousand of coastal families are directly engaged in fishing activities and coastal aquaculture including related activities such as fish processing, marketing, boat building, net making, etc. Most of the coastal fisheries communities in the Asian Region are characterized as small-scale fisheries. The production from small-scale fisheries contributes to national economic growth. Nevertheless, the endowment, potential, and resilience of the small-scale sub-sector have not been recognized and highlighted, while it is immensely contributed to resource utilization.

Since the region's coastal fisheries resources, once viewed as inexhaustible source of fish protein for human consumption have deteriorated, concerns have therefore increased for the protection and conservation of the coastal resources for sustainable livelihoods and food security of the coastal dwellers. The fishers' over-dependence on the coastal fisheries resources has however, led to over-exploitation and degradation of the resources. The conflict on the multiple resource use also threatens the livelihood of coastal fishing communities.

In addition, the coastal dwellers are also prone to the drastic change of coastal environment. The recent devastations caused by natural disasters hamper the vulnerability of these communities. The coastal villages throughout the region are also facing hardships due to the impact from climate change such as sea level rise, increase of sea temperature, change of fish habitat and its ecosystem, natural hazards, etc. The ASEAN-SEAFDEC Member Countries have put a serious concern on this issue and identified the required adaptive measures and activities to mitigate the impacts of climate change to be undertaken by SEAFDEC and the national agencies responsible for fisheries in the Member Countries.

Many fisher communities seem to be isolated and/or insufficient benefit from government services net systems that may exist in other areas of the country. In addition, the communities have to pay more for fuel, food and services, while the income from their products is an inverse. These problems brought about unsustainable use of fishery resources, by reason of the fisher communities have to continuously intensify their fishing efforts to maintain their livelihoods.

Since the enhancing of coastal fisheries communities' resilience is involved with various cross cutting issues and required strong commitment and coordination from national government, organizations, local institutions, this project is therefore proposed in order to improve livelihoods of the coastal dwellers, through community fisheries organization and governance in order that the coastal resources utilized by the fishers could continue to sustain its function as the source of food and provide means of livelihood for the region's fishing communities. This project aims to improve the socio-economic status of the coastal dwellers through community fisheries organization and governance in order to the coastal resources utilized by the fishermen could continue to sustain its function as the source of food for the region's fishing communities. The target beneficiaries of this project are the coastal communities in the ASEAN-SEAFDEC Member Countries.



## 2. Project Description/Justification

Fishing related coastal communities often demonstrate high levels of vulnerability, many small-scale fishing families are increasingly caught in a poverty trap. The growing domestic and international demand for fish and fish products has resulted in the excessive exploitation of aquatic resources in the region. The number of small fishermen keeps increasing; the size and number of coastal villages are becoming larger and larger. Whenever the fishery resources are threatened, it is definitely impact to the coastal communities where their livelihoods depend very much on coastal resources. The local income of coastal fishery communities and people involve in fisheries associated activities (*i.e.* fish processing, marketing, boat building, net making, etc.) are determined by coastal resources for a significant part of their livelihoods. The fishermen have to compete with both people and natural resources, the fishermen therefore continuously intensify their fishing efforts to maintain a status quo. This leads to the tragedy of resources utilization which the fishermen are driving resources down both in terms of quality and quantity; and they will be finally caught in a poverty trap.

Apart from the degradation of fishery resources, biophysical and socio-economic condition in the coastal zone is highly vulnerable to the impacts of climate change and natural such as erosion, cyclone, sea-level rise, increases in sea-surface temperature and unpredictable effects of climate change on the coastal environments changes (*i.e.* natural hazards, resources productivity, degradation of habitat and ecosystem, etc.). These climate change-related stresses could increase risk of coastal fisheries communities and effect to the development of fisheries more difficult in improving people livelihood and ensuring food security as well as addressing on fisheries management approach. These could bring about degeneration of economic well-being, risk in safety and efficiency of fishing operation, lost of fish caught, as well as implication on employment and vital source of protein for poor people. To assist the fisheries communities from these subsequence, there is a need to build up community resilience in coping with such cases.

Coastal dwellers are facing degradation of fishery resources, at risk of natural disaster, dealing with low standard of living and poverty. Many fisher communities are outside of any social safety net systems that may exist in other areas of the country. Thus, the need to strengthen community fisheries organization and capacity building for better development and management of the coastal resources to ensure sustainable livelihood of coastal communities, has become very urgent. It is indeed important that appropriate coastal resources management, alternative livelihoods should be put in place.

## 3. Objectives

The overall goal of the project is to improve the socio-economic status of the coastal dwellers and to promote sustainable utilization and management of the coastal resources.

The specific objectives of the project are:

1. To enhance the capacity and capability of fishers and women in the fishing community to improve their social well-being and contribute to poverty alleviation; and
2. To build the capacity of the fishing communities to engage in sustainable livelihoods and improved coastal resource management.

## 4. Intended activities to be implemented in the project

### Output 1

Community baseline information and needs assessment for technology transfer and human resource development.

#### Activity 1: Community Survey and Needs Assessment

- 1.1 Planning and preparation of community survey questionnaires.
- 1.2 To carry out field surveys for baseline information and needs assessment surveys.
- 1.3 To conduct analysis to identify and prioritize community activities for technology transfer and human resource development.

### Output 2

Strengthen capacity of the fishing communities to engage in sustainable livelihoods and improved coastal resource management.

Activity 2: Training/Workshop/Meeting on Strengthening of Fisheries Associations for Fishing Community

- 2.1 Training, meeting and workshops on organizational functions and responsibilities
- 2.2 Capacity building for community leaders on leadership, community management, participatory planning on resource management and sustainable livelihood, conflict management and improving women livelihoods

### Output 3

Enhancement capacity and capability of fishers and women in the fishing community to improve their social well-being and contribute to poverty alleviation

Activity 3: Capacity Building of Coastal Communities on Sustainable Livelihoods and Resource Management

- 3.1 Knowledge transfer and training on improving human resources development based on the need assessment survey.
- 3.2 Knowledge transfer and training on enhancing community business ventures
- 3.3 Knowledge transfer and training on promoting alternative livelihood
- 3.4 Knowledge transfer and training on improving governance and resource use practices

### Output 4

Pilot project for improvement of enhancing coastal community livelihood

Activity 4: Second phase of the enhancing coastal communities in three SEAFDEC Member Countries

- 4.1 Pilot project for improving and diversifying fish production systems
- 4.2 Pilot project for alternative livelihood
- 4.3 Pilot project for coastal resources management

### Output 5

Monitoring and evaluation the progress of the project

Activity 5: Project Evaluation and Reporting

- 5.1 Project inception meeting and report.
- 5.2 Project evaluation and progress meeting and report.
- 5.3 Project terminal meeting and report.

## **5. Progress and status**

Project proposal will be submitted to Mission of Japan to ASEAN and ASEAN secretariat



## STATEMENT

*By Dr. Vivekanandan Elayaperumal*

*The Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO)*

The Bay of Bengal Programme Inter-Governmental Organisation (the BOBP) places on record its sincere thanks to the Southeast Asian Fisheries Development Center (the SEAFDEC) for inviting the BOBP to participate as an Observer in the 41<sup>st</sup> Meeting of the SEAFDEC Program Committee being held in the Bayview Hotel, Langkawi, Malaysia from 5 to 7 November 2018.

At the outset, the BOBP takes this opportunity to congratulate the SEAFDEC on its 50<sup>th</sup> Anniversary and to compliment the Center for its exemplary work to fulfil the vision to “Promote sustainable management and development of fisheries and aquaculture to contribute to food security, poverty alleviation and livelihood of people in the Southeast Asian Region” and to meet the mandate “to develop and support the management of fisheries in the Southeast Asian region by rational utilization of the region’s aquatic resources to provide food security to the people through a balanced approach to fisheries and habitat management”.

The vision of the BOBP is to promote, facilitate and secure long-term development and utilisation of coastal fisheries resources of the Bay of Bengal based on responsible fishing practices and environmentally sound management programmes. The BOBP is mandated to enhance cooperation among its member-countries, namely Bangladesh, India, Maldives and Sri Lanka and provide technical and management advisories for sustainable coastal fisheries development and management in the Bay of Bengal region. The Organisation is focusing on helping its members in ensuring livelihood security of fishers and their families in the region.

The mandates of the two Organisations are strikingly common with a Mission to “Promote and facilitate concerted actions among their members to ensure sustainability of fisheries”. Bordering the Bay of Bengal, SEAFDEC has member-countries on the eastern side of the Bay, namely Indonesia, Malaysia, Myanmar and Thailand; the BOBP is working with countries on the western side of the Bay. As the goals of both the organisations are common, there is a great opportunity for cooperation and partnership between the two. Towards realising this, representatives from both the Organisations have exchanged visits to participate in meetings/workshops in recent years. However, there is much greater scope to expand this cooperation in the common grounds based on our strengths and explore what we can offer to each other and also learn from each other.

The BOBP is engaged in a range of activities on fisheries management. Based on the needs identified by its member-countries, the following programmes are highlighted here:

**(i) Regional Programme on Safety at Sea for Artisanal and Small-scale Fishermen:** While fishing-at-sea is probably the most dangerous occupation in the world, the problem is all the more acute in the Bay of Bengal region, where sea safety measures among artisanal and small-scale fishermen are rudimentary or non-existent. BOBP’s engagement in this vital area aims at formulating a holistic long-term approach to improving safety-at-sea for small-scale fishers. Necessary measures include analysis of accident data; education and training of trainers, fishermen and inspectors; better fisheries management and enforcement; stronger collaboration between fishermen, fisher organisations and governments.

**(ii) Regional Programme for Fish Stocks Assessment in the Bay of Bengal:** Some of the characteristic features of fisheries in the Bay of Bengal region are open access, excessive fishing capacity and resource conflicts. The Programme on Fish Stock Assessment seeks to provide a mechanism through which member-countries could participate in a regional stock assessment and also develop national capacities to carry out resource surveys and improve fishery statistics in support of fisheries management.

**(iii) Capacity Building and Information Services for Fisheries Development and Management in the Bay of Bengal Region:** There is a strong optimism that the Bay of Bengal region can produce significantly more fish than at present, through better management of the resources. What is needed, apart from appropriate technology inputs, are institutional capacity building, better all-round awareness of management and adoption of a community-based participatory approach. The BOBP is addressing these issues through need-based capacity building programmes. Some of the regional/national capacity building programmes taken up recently are: FAO's Code of Conduct for Responsible Fisheries; Stock Assessment of Tropical Marine Fishes; Ecosystem Approach to Fisheries Management; Fisheries Co-Management; and Knowledge Management in Marine Fisheries.

**(iv) Capacity in preparation of Fishery Performance Indicators (FPIs):** To ensure long-term ecological and economic success of fisheries and to attract private sector for responsible fishery investment, it is important to develop criteria for investment. One of the selection criteria suggested by the World Bank is to employ Fishery Performance Indicators (FPIs) using triple bottom line outcomes of economic, social and ecological sustainability. BOBP has developed in-house capacity to prepare FPIs for highly migratory fish stocks, namely the tunas, with potential for application in other fisheries. The services of BOBP are available to prepare FPIs for important fisheries in the Region.

**(v) National/Regional Workshops/Conferences on important fisheries issues:** To facilitate national/regional implementation of strategic plans on specific fisheries issues, the BOBP has conducted national/regional workshops/conferences on specific themes such as Illegal, Unreported, Unregulated (IUU) fishing; Monitoring, Control and Surveillance (MCS); Preparation of National Plan of Action for Shark Fisheries Management, Fishing Fleet Performance; and Management of Highly Migratory Fish Stocks. These events assist members in raising awareness; facilitating active learning opportunities; and reviewing, updating and implementing specific strategies and action plans, with consideration given on how to mainstream it into broader national policies.

**(vi) Ocean Partnership Project for Sustainable Fisheries and Biodiversity Conservation - Models for Innovation and Reform:** The Ocean Partnership Project – Bay of Bengal (OPP-BOB), funded by the Global Environment Facility (GEF) with support from the World Bank, is part of an international programme implemented by the BOBP aiming to promote better management of fisheries for highly-migratory species such as tunas and also explore investment opportunities in these fisheries. The other goal of the Project is to develop partnerships at different levels such as a public-private development consortium which could then carry forward such strategies for future development. Under this Project, the BOBP-IGO has developed 4 investable Business Cases on Tuna Fisheries, which can be shared with a larger audience in the region.

Both SEAFDEC and BOBP have a strong identity of their own on one hand and similar value base including mission on the other. The UN Sustainable Development Goals call for strong partnerships in addressing the targets under SDG -14, 'Life Below Water' and both SEAFDEC and BOBP can build strong cooperation and partnerships to add value to our works through combined efforts, thus meeting the developmental aspirations of the communities that we work for.

Thank you!

## STATEMENT

*By Dr. Hendra Yusran*

*The Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security (CTI-CFF)*

Assalamualaikum warahmatullahi wabarakatu  
Selamat pagi and very good morning to all,

Excellencies, Ladies and Gentlemen,

First of all, I would like to thank SEAFDEC for giving me this opportunity to speak on behalf of the CTI-CFF Regional Secretariat and on behalf of the CT6 countries.

Excellencies, Ladies and Gentlemen,

Back in April 2015, at the 47<sup>th</sup> Meeting of the SEAFDEC Council in Thailand, the CTI-CFF signed a 5-years Memorandum of Understanding with SEAFDEC to collaborate on overlapping spatial areas of the CTI-CFF and SEAFDEC. The discussion on the MOU started with the conduct of the Intergovernmental Forum on Live Reef Food Fish Trade (LRFFT) and since then have had several technical activities including the promotion of the Ecosystem Approach of Fisheries Management and conservation and management of fishery resources in the coral triangle area.

Excellencies, Ladies and Gentlemen,

As a continuation of the EAFM implementation and promotion, through the CTI-CFF EAFM Technical Working Group, CTI-CFF worked with the USAID Oceans on the development of a Sub-Regional Plan for Managing Transboundary Fisheries in the Sulu Sulawesi Seascape. It takes an Ecosystem Approach to Fisheries Management (EAFM) and outlines a relevant set of goals, objectives, and management actions to empower relevant national and regional management within the Sulu Sulawesi Marine Ecoregion. This Plan would be the first of its kind in this region.

Naturally, several stakeholders' consultations have been organized with CTI member countries since August 2017 and we are hoping that the plan will be adopted in the upcoming SOM-14 in Manila, Philippines come December 2018. I must add that this Plan is not new in the sense that it is build upon from a draft plan developed back in 2015 by the USAID-supported CTI-CFF initiative, in collaboration with ADB, GIZ and NOAA. This Plan is an endeavor to update the draft plan, expand it and take into consideration inputs through a regional workshop that convened over 90 participants from 10 SEAFDEC and CTI-CFF member countries as well as other partners undertaking fisheries management work in Southeast Asia.

The CTI-CFF is also working with USAID Ocean on its other priority goals in combating IUU; mainstreaming human welfare and gender equality in the seafood industry and fostering public-private partnerships.

I am sure my colleague from USAID Oceans here shall be more than happy to elaborate more on the progress that it has achieved thus far.

Excellencies, Ladies and Gentlemen,

For the benefit of all who are here, the CTI-CFF is currently at the start of developing its second Regional Plan of Action (RPOA 2.0).

The core move for this new development is to consider a more focused approach on regional actions that the Coral Triangle region could benefit from, learn from other regional organizations such as SEAFDEC and expand its best practices in the CT region, particularly in the Pacific region such as in the Bismarck

Solomon Sea. Conversations shall be moved beyond conservation and resource management to food security, higher incomes, improved health and well-being, and contribution to sustainable development.

Based on preliminary discussions and general consensus, the priority areas for CTI-CFF would probably be in managing priority seascapes and the full application of ecosystem approach to fisheries management (EAFM) in the CT region. With a more focused approach, the CTI-CFF would require much active participation, experts' inputs and global presence to influence national policies and gain significant resources for implementation without duplicating existing work, but rather, focus on its core competencies and comparative advantage and complement other work by aligning more strategically with other organizations such as SEAFDEC.

Excellencies, Ladies and Gentlemen,

One area that we could work together and benefit from the seascape approach and expansion on the ecosystem approach to fisheries management would be on the USD1billion a year industry that is Live Reef Fish for Food Trade (LRFFT). As most of you are aware, there is an urgent need to regulate this industry. This unchecked and unregulated industry is threatening poor communities that rely on the fishery for their livelihoods and **discounted** them from benefiting the **true** value of the industry. Key predator species such as the grouper, coral trout and Napoleon wrasse are fast becoming extinct due to the unsustainable practices of harvesting juveniles. To quote WWF statement, campaigns against shark-finning have achieved some success but it is difficult to raise similar levels of awareness about this less iconic species in spite of their crucial role in sustaining the reef ecosystems.

Mariculture would be a potential solution but not without its disadvantages. It does not necessarily reduce pressure on wild populations. Juveniles would still be needed for grow-out and consumers still prefers wild caught fish.

A radical approach would have to be designed to address this issue and I believe this platform, where regional organizations meets would be one of the best avenues to continue this conversation, and design solutions. A potential approach would be through public-private partnerships and this would drive decision-makers and businesses; and more importantly the consumers of the importance of knowing where seafood comes from; the economic benefit of managing this industry and that it is not an infinite source of food.

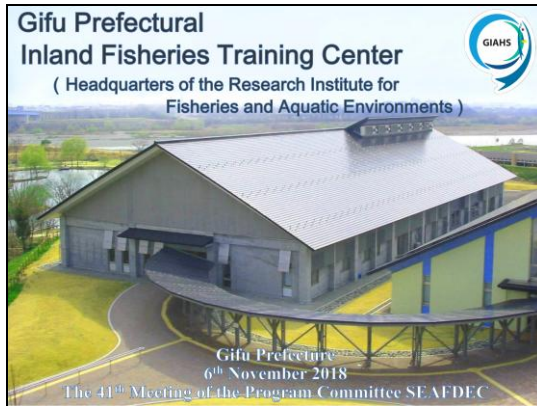
Excellencies, Ladies and Gentlemen,

With the existing MOU ends in April 2020, I would like to urge for us to make full use of this relationship to making our voices heard and ultimately for the economic benefit to be fairly distributed to the beneficiaries and especially to the communities.

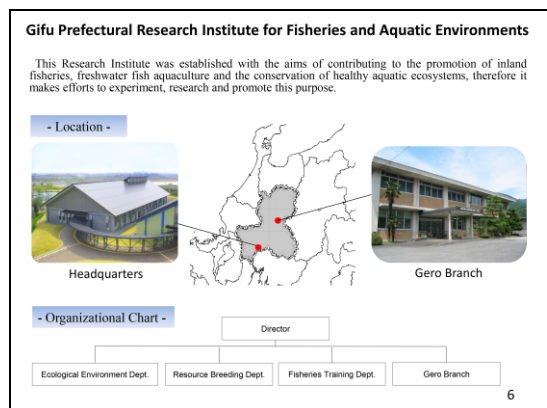
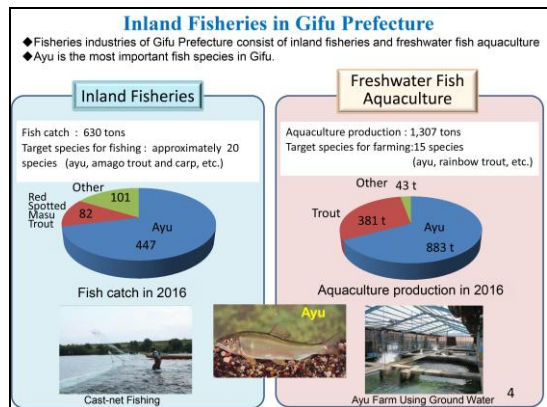
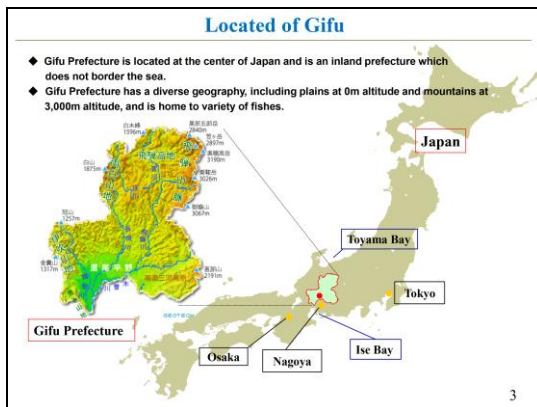
Thank you.

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 2019





**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"> <li>• Globally Important Agricultural Heritage Systems               <ul style="list-style-type: none"> <li>• GIAHS and the Certification Procedure</li> <li>• GIAHS "Ayu of the Nagara River System"</li> <li>• The Nagara River System and its action plan</li> </ul> </li> <li>• Environmental Conservation Initiatives in Consideration of the Links with Mountains, Rivers, and the Sea               <ul style="list-style-type: none"> <li>• Clean river conservation (legal system and efforts)</li> <li>• Significance of biodiversity and preservation measures</li> <li>• Preservation examples of rare fish species</li> </ul> </li> <li>• Fishery Resource Management by Fishery Cooperatives               <ul style="list-style-type: none"> <li>• Increasing fishery resources (definitions, categorization, etc.)</li> <li>• Propagation method (release of fry, release of artificially hatched juvenile fish, construction of spawning grounds, etc.)</li> <li>• Fishery resource management system with Ayu as illustrative example (legal system and efforts)</li> </ul> </li> <li>• Aquaculture Technology               <ul style="list-style-type: none"> <li>• Increasing ayu, salmon and/or trout, carp, catfish, etc.</li> <li>• Production of triploid fish, Fish disease diagnosis</li> </ul> </li> </ul>
Excursion	<ul style="list-style-type: none"> <li>• Facilities to support "the Nagara River System"               <ul style="list-style-type: none"> <li>• Fishery Cooperatives (ayu cargo market)</li> <li>• Production facility of ayu fry for release</li> </ul> </li> <li>• Traditional fishing methods in Gifu Prefecture and some related facilities (common fishing, angling ayu by decay, net fishing, yara fishing, etc.)</li> <li>• Old streets which remain wisdom to protect clear waters</li> <li>• World Freshwater Aquarium Aquatotto Gifu</li> <li>• ICID World Irrigation facility heritage "Sodai Irrigation Channel"</li> <li>• Other aquaculture facilities               <ul style="list-style-type: none"> <li>• Spawning ground rivers and artificial rivers, Facilities for processing fishery products, Private aquaculture farms (salmon and/or trout, sturgeon, catfish, King Prawn, etc.)</li> </ul> </li> </ul>
Practical training	<ul style="list-style-type: none"> <li>• Aquaculture Technology: Ayu, salmon and/or trout, sturgeon, catfish, etc.</li> <li>• Juvenile fish diagnosis technology: Optometric observation of tissue, DNA and RNA extraction and their increase</li> <li>• Production technology of triploid fish: Feminization or triplication of ayu or trout, etc.</li> </ul>

**Activity Plans of Training Center for Next Year (SEAFDEC related)**

- Acceptance of Trainees
  - Number of Trainees: About 5 people
  - Recruiting Period: Around April 2019
  - Duration of Training: About 1 - 2 weeks
  - Training Period: Around late August (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 (improvement of hatching rate)
- Period: Since 2016
- Result: Survival rate up to fry has almost doubled.






## STATEMENT

*By Ms. Åsa Hedén  
The Embassy of Sweden in Bangkok*

Good afternoon,  
Excellencies,  
SEAFDEC secretariat,  
Friends of SEAFDEC,  
Ladies and gentlemen

My name is *Åsa Hedén* and I'm representing the Swedish Embassy in Bangkok and Sida, thank you for inviting Sweden to the 41st Meeting of the Programme Committee of SEAFDEC. I would also like to thank the Director General for Fisheries Malaysia to host us here in Langkawi.

As you all know, pressure on the Oceans has increased. Overfishing, pollution and acidification are serious threats to Ocean and people's livelihoods in the region. Ultimately, threatening human rights to health, life and natural resources.

These are one of many reasons why Sweden finds it important to support regional collaboration to protect marine and coastal ecosystems.

1. The last years we have witness the world's leader taking stronger global political leadership, and actions to save the oceans- which is a promising development.
2. In November 2017, SEAFDEC launched its new Vision, Mission, and Strategies towards 2030. This new framework stresses the necessary actions that SEAFDEC is to undertake with Vits Member Countries, to improve sustainability of the Southeast Asian fisheries and aquaculture.

SEAFDEC is an important development partner to Sweden in the delivery of SDG 14. (Life below water). As a technical and advisory body to ASEAN, you have succeeded to build capacity and management of transboundary marine resources, enhancing the conditions for sustainable fisheries in the region.

The close collaboration between Sweden and SEAFDEC within the project "Fisheries and Habitat management, Climate change and Social Well Being" so well presented by Khun June before lunch, has thanks to SEAFDEC's hard work generated many important achievements. I hope that SEAFDEC can disseminate and share the lessons learned from the project, when it comes to an end next year.

I would like to highlight two important on- going and quite challenging processes within SEAFDEC:

- 1) The development of an "ASEAN Fisheries Policy", which we believe will create a conducive regional environment for a responsible and sustainable fisheries and food security. Developing a regional policy is a complex issue, which demands mutual trust and close cooperation across national borders, which is not an easy task. However, we believe that SEAFDEC can lead this process forward in cooperation with its member- states. but it requires strong engagement and ownership from the Member Countries.
- 2) SEAFDEC's efforts to increase awareness and build capacity on FAO Voluntary Guidelines for Securing Small -Scale Fisheries – with specific focus on food security and poverty alleviation, clarifying basic concepts of human rights-based approaches and gender equity is important.

Although we know that women are crucial to the fisheries sector, and studies have revealed that they comprise almost half of the labour force in developing countries, their contributions have often gone undocumented.

We are therefore pleased to see that SEAFDEC has put more emphasis on gender awareness and capacity building in the fishing sector during the last years.

It is a major achievement that the SEAFDEC Council has agreed to support the initiative to develop a comprehensive regional Gender Strategy for the ASEAN Member States based on the FAO guidelines. It is our strong belief that SEAFDEC will continue to be one of the major actors to strengthen regional cooperation between all ASEAN Member States. We hope that the involved governments will value and benefit from the new management systems for fisheries and aquaculture which are being developed by experts working at SEAFDECS technical departments and the secretariat in Bangkok. It is important that Member Countries continue to put engagement and resources into SEAFDEC, so the organization will continue to deliver relevant expertise to its member- countries.

Wishing you all the best in your important work for the Oceans.

Thank you for your attention

## STATEMENT

*By the U.S. Agency for International Development/Regional Development Mission for Asia  
(USAID/RDMA)*

Distinguished Members of the Southeast Asian Fisheries Development Center (SEAFDEC) Program Committee;  
SEAFDEC Senior Officials;  
Representatives and Collaborating Partners;

Good afternoon,

The U.S. government would like to extend its gratitude to SEAFDEC for the opportunity to participate in this 41<sup>st</sup> Program Committee Meeting (PCM). We also would like to extend our thanks to the Government of Malaysia for its hospitality and leadership in hosting this important meeting, to each of the SEAFDEC Member Countries, to the Japanese Trust Fund, and to the Government of Sweden.

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. We are grateful to be a part of this supportive, effective partnership on sustainable fisheries in Southeast Asia. We congratulate SEAFDEC and its members on a successful meeting with impressive results described throughout the activity reviews. We appreciate this opportunity to come together each year to review progress, discuss regional concerns, ask questions and, in doing so, promote continuous improvement.

USAID is deeply committed to this continued progress and engagement. Through the USAID Oceans and Fisheries Partnership (USAID Oceans), USAID and SEAFDEC have been working together since 2015; and throughout the region, USAID has developed a portfolio of programs that are working to build the resiliency of Southeast Asia's fisheries and enhance the capacities of the millions of individuals that support it. These initiatives include the regional USAID Asia Counter Trafficking in Persons program and the Indonesia Sustainable Ecosystems Advanced (SEA) project. The U.S. government looks forward to continuing to support the region through these programs and those that will follow.

Since the launch of USAID Oceans in 2015, USAID has seen a significant shift in regional interests for electronic traceability, sustainable fisheries management, and human welfare. Whereas just a few years ago we were all working to bolster interest in these areas, we now see regional demand and increasing discourse across each of these topics—of which we believe SEAFDEC has played an essential role.

Under USAID Oceans' priority areas—traceability, fisheries management, human welfare, and increased public-private sector engagement—we have seen great progress over the last year. In 2018, 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; 2) implement electronic traceability systems in more than two countries, with the electronic ASEAN Catch Documentation Scheme (eACDS) being increasingly requested by Member Countries; 3) continue to increase awareness of human welfare aspects of fisheries, particularly around gender equity; and 4) continue to increase private sector interest in fisheries as a marketplace for innovation.

We are all convinced that there is a great need to manage and protect the fisheries of Southeast Asia. This need is urgent and it is immediate. SEAFDEC's initiatives fully realize these realities, as evidenced by their efforts in the last year to support the development of a Sub-Regional Sulu-Sulawesi Seascape Sustainable Fisheries Management, and their work to apply this sub-regional planning approach to other priority areas in the region. The plan has now been handed over to the Coral Triangle Initiative for Coral Reefs, Fisheries, and Food Security (CTI-CFF) to be proposed for adoption in the December Senior Officials Meeting—without SEAFDEC this accomplishment would not have been possible. If adopted, the Sub-Regional Sulu-Sulawesi Seascape plan will be the first known, implemented sub-regional plan in fisheries literature. It employs a multi-national approach that is required for effective plans that can be

scaled down to meet national and local needs and also scaled up to meet regional and international priorities and has been developed through a multi-national, multi-stakeholder process. We thank SEAFDEC and its Member Countries for their ongoing support and contributions to the plan, and we hope that the plan will provide a meaningful example for future planning in other regions.

SEAFDEC's continued development of the eACDS must also be recognized and commended, as regional demand has continued to grow month after month. USAID, through USAID Oceans, is fully committed to doing its utmost to support the system and its adoption throughout the region. In 2018, USAID Oceans was pleased to be able to provide technical research and recommendations to SEAFDEC Member Countries, including Viet Nam, Malaysia, and Thailand. We look forward to continuing this work in 2019.

USAID believes that the partnerships SEAFDEC has formed throughout the region are a critical driving factor behind the progress that has been made across the region to combat illegal, unreported, and unregulated fishing and enhance the sustainability of Southeast Asia's fisheries. USAID is proud to be part of this partnership, and we will continue to facilitate engagement of the U.S. Department of State, the National Oceanic and Atmospheric Administration, the Department of Interior, and other U.S. government counterparts towards this goal. 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, regional fisheries management organizations, the Food and Agriculture Organization and others to synergize efforts. USAID will also continue to strengthen our relationship with SEAFDEC to promote its leadership and advance the priorities of its Member Countries towards national and regional priorities.

Thank you again for the opportunity to participate in another successful PCM. We look forward to the discussions to follow and our continued collaboration in the coming year.

### WAY FORWARD FOR RESOLUTION AND PLAN OF ACTION ON SUSTAINABLE FISHERIES FOR FOOD SECURITY FOR THE ASEAN REGION TOWARDS 2020

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 (*Appendix 1*) 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 50<sup>th</sup> 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 would like to propose the review process and its tentative work plan for reviewing the RES&POA-2020 as follow:

Timeframe	Activities and achievements	Remarks
Nov. 2018	The Forty-First Meeting of the Program Committee Meeting of the SEAFDEC, and the Twenty-First Meeting of Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP)	Output: Adoption of the tentative work plan for revising the RES&POA-2020
Jan. to Feb. 2019	Evaluation of the implementation of the RES&POA-2020	AMSs to provide inputs based on the template reporting on the implementation of the RES&POA-2020 ( <i>Appendix 1</i> ) Feedbacks from the AMSs will be analysed for evaluation of the implementation of the RES&POA-2020.
Mar. 2019	The Meeting for Way Forward of the RES&POA-2020	Output: (1) Dissemination of the results from the evaluating of the RES&POA2020 (2) Prioritization, clarification and specification of issues for the revision of the RES & POA-2020
April 2019	The Fifty-First Meeting of the Council	The Council takes note on the progress for evaluation of the RES&POA-2020,

		including priorities and issues for revision of the RES&POA-2020
May 2019 (Tentative)	The 26 <sup>th</sup> ASWGFi Meeting	ASWGFi considers to review and update the RES&POA-2020
May 2019	Nomination of the ASEAN National Focal Points	The National Focal Point will be nominated by the SEAFDEC Council Director
May to Aug. 2019	Series of technical meetings for revision of the RES&POA-2020	Inputs for the zero draft of RES&POA-2020 (rev.)
Oct. 2019	The Meeting of ASEAN-SEAFDEC National Focal Points	The zero draft of RES&POA-2020 (rev.)
Nov. 2019	The Forty-Second Meeting of the Program Committee Meeting of the SEAFDEC, and the Twenty-Second Meeting of Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP)	Adoption of the zero draft of RES&POA-2020 (rev.) by the FCG/ASSP
Apr. 2020	The Fifty-Second Meeting of the Council	Adoption of the RES&POA-2020 (rev.) by the Council
July 2020	The Twenty-Seven ASWGFi Meeting	Adoption of the RES&POA-2020 (rev.) by ASWGFi
August 2020	Meetings of higher authorities of ASEAN	Adoption of the RES&POA-2020 (rev.) by higher authorities of ASEAN

#### **REQUIRED CONSIDERATION BY THE MEETING**

The Meeting is requested to provide directives on way forward of the RES&POA-2020 after its timeline, including possible revision of the document and appropriate mechanism for adoption by the higher authorities of ASEAN.

**REPORT ON THE IMPLEMENTATION OF THE 2011 RESOLUTION AND PLAN OF ACTION**

Country: \_\_\_\_\_

Period Covered: \_\_\_\_\_ to \_\_\_\_\_

Resolution No.	Relevant Plan of Action	Program/activities Title	Duration	Lead Agency and Collaborating Partners	Program Description and Expected Outputs	Achievement and Lessons Learnt





## **JAPANESE TRUST FUND (2020-2024)**

The Government of Japan has provided SEAFDEC with the Japanese Trust Fund (JTF) since 1998 for around 20 years. Currently, the JTF is in its 6<sup>th</sup> period (JTF-VI) that started in 2013 and will finish in 2019. As it is expected that a new “JTF” (7<sup>th</sup> period) will start in 2020 for 5 years, SEAFDEC submitted draft Framework and Project Proposal Sheets to the Fisheries Agency of Japan for their consideration, and as a reference in the national budget request process in 2018.

In 2019, SEAFDEC Secretariat and Departments (TD, MFRD, AQD, MFRDMD and IFRDMD) have to identify new projects and develop project annual plans for “JTF” (7<sup>th</sup> period), referring to the result of budget request by the Government of Japan.

### **Draft JTF (7<sup>th</sup> period) Framework**

#### **Basic policies**

1. For more flexible implementation of projects by avoiding too many and too subdivided small projects
  - Set four large pillars and consolidate/organize/arrange/conduct individual projects under those pillars
2. For more effective implementation of projects including dissemination of the technologies
  - More active participation of the project target sites, including further involvement of human resources in the sites
3. For more efficient implementation of projects through objective evaluation
  - Annual review of all projects and evaluation of progress based on numerical targets

#### **Four project pillars, example of projects and relevant departments under each pillar**

1. Establishment of good governance, including countermeasures against IUU fishing
  - electronic ASEAN Catch Documentation Scheme (e-ACDS), regional fishing vessel record (RFVR), Port State Measures (PSM) [SEC, TD]
  - guidelines for combating IUU fishing [SEC, TD, MFRDMD]
  - management of fisheries including offshore and inland fisheries [TD, MFRDMD, IFRDMD]
  - fisheries statistics, SEAFDEC network [SEC]
2. Conservation and management of aquatic resources and ecosystem
  - management of eel, sharks and rays, and other important species including offshore species [TD, IFRDMD, MFRDMD]
  - resource enhancement, management of habitats [TD]
  - sustainable aquaculture [AQD]
3. Better livelihood of the fisheries communities
  - community-based fisheries management, human resource development, energy saving, safety at sea [TD]
4. Ensuing Safety and quality of fish and fishery products
  - traceability, eco-labeling, safe and high-quality fish products, post-harvest technologies, fish handling techniques [SEC, TD, MFRD]



## DEVELOPMENT OF THE SEAFDEC GENDER STRATEGY

### 1. Background and Rationale

Throughout the past decades, the importance of gender equality and equity has been well recognized by a number of international instruments and policy frameworks, such as the UN Sustainable Development Goals (SDG) and the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication. Specifically for the ASEAN region, guided by 1988 Declaration on the Advancement of Women in ASEAN, the ASEAN Sub-Committee on Women (ASW) was established in 1975, and was subsequently elevated to ASEAN Committee on Women (ACW) in 2001. This ACW carries out the coordination and monitoring of the ASEAN's key regional priorities and cooperation on women's issues and concerns asserting women's empowerment.

As for the region's fisheries sector, the "Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020" which was adopted during the ASEAN-SEAFDEC Conference in 2011 asserts the required actions to "*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.*" Along this line, the Resolution on the Future of SEAFDEC Toward 2030, adopted during the Special Meeting of the SEAFDEC Council in November 2017, also specifies a Strategy toward "*Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries.*" Member Countries' respective governments and SEAFDEC therefore hold the responsibility to ensure the implementation of commitments agreed in the aforementioned global and regional frameworks, while pursuing the sustainable development and management of fisheries and aquaculture.

To support the integration of gender perspectives in fisheries within SEAFDEC and its Member Countries, SEAFDEC therefore proposed during the 50<sup>th</sup> Meeting of the SEAFDEC Council in March 2018, in Siem Reap, Cambodia to develop a "**SEAFDEC Gender Strategy**." It is envisaged that the SEAFDEC Gender Strategy would provide an overarching framework to facilitate SEAFDEC's efforts toward integrating gender in its future programs and projects, which would eventually support the integrating gender perspectives in fisheries in the respective countries. It was also proposed that the first draft of the Strategy shall be developed by SEAFDEC and submitted to the 41<sup>st</sup> Program Committee Meeting for comments, and the final draft of the Strategy is expected to be submitted to the 51<sup>st</sup> Council Meeting for consideration. While expressing its support to this proposal, the SEAFDEC Council at its 50<sup>th</sup> Meeting emphasized that the development of the SEAFDEC Gender Strategy must be in the context of the ASEAN perspective.

### 2. Progress in Development of Draft SEAFDEC Gender Strategy

In line with the policy directives given by the Council, SEAFDEC by the Gender Working Team comprising members from SEAFDEC Secretariat and Training Department (TD), and in consultation with the SEAFDEC Gender Focal Persons from the other Departments, namely AQD, MFRDMD and IFRDMD, therefore convened an "Inter-Departmental Meeting on Development of SEAFDEC Gender Strategy" on 3-4 September 2018 in Bangkok, Thailand, and came up with the first draft of the SEAFDEC Gender Strategy (*Appendix 1*).

It is envisaged that SEAFDEC Gender Strategy, incorporating views and comments from the SEAFDEC Program Committee at its 41<sup>st</sup> Meeting, would be further submitted to the 51<sup>st</sup> Meeting of the SEAFDEC Council for consideration.

### 3. Required Consideration by the Meeting

The Program Committee is requested:

- 1) To take note of the SEAFDEC Council's directives, and the progress made by SEAFDEC in development of the draft SEAFDEC Gender Strategy; and

- 2) To provide comments on the draft SEAFDEC Gender Strategy, which shall be further incorporated into the document prior to submission to the 51<sup>st</sup> Meeting of the SEAFDEC Council in 2019.

## **SEAFDEC GENDER STRATEGY: MAINSTREAMING GENDER IN SEAFDEC AND ITS PROGRAMS**

The Southeast Asian Fisheries Development Center (SEAFDEC) is an autonomous inter-governmental body with the vision towards “*sustainable management and development of fisheries and aquaculture to contribute to food security, poverty alleviation and livelihood of people in the Southeast Asian region.*” Working with the national fisheries agencies in 11 SEAFDEC Member Countries<sup>1</sup> as well as with relevant partners, and being aware that gender is one of the important issues in ensuring the sustainable development of the fisheries sector of Southeast Asia, which includes largely small-scale fisheries and aquaculture, SEAFDEC is therefore adopting its Gender Strategy to facilitate gender mainstreaming at all levels of the organization, and serve as an organizational overarching framework to facilitate SEAFDEC’s efforts in integrating gender in its programs, projects, and activities. The SEAFDEC Gender Strategy is also intended to subsequently support the integration of gender perspectives in fisheries and aquaculture in the Member Countries of SEAFDEC.

### **International and Regional Policies on Gender in Fisheries**

In recognition of the global issues related to food security and alleviation of poverty over the past decades, the international, regional, and national communities have been giving more focus on gender equity in sustainable development. Given such background, the UN Sustainable Development Goals<sup>3</sup> include targets that address issues on gender, human rights, and social well-being in small-scale fisheries development. Likewise, gender equity and equality are also upheld as fundamental guiding principles in the FAO Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication<sup>4</sup> (SSF Guidelines) that calls for concerted efforts on the part of all stakeholders to include gender equality as integral part of all small-scale fisheries development strategies.

In the Southeast Asian region, gender perspective has also been highlighted in the ASEAN-SEAFDEC Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020<sup>5</sup>, which calls for “*strengthened capacity of relevant stakeholders and harmonized initiatives that support fishing communities and governments, with a special focus on the women and youth.*” During the Special Meeting of the SEAFDEC Council in November 2017, the Council adopted the Resolution on the Future of SEAFDEC, including the Vision, Mission, and Strategies Towards 2030<sup>6</sup>, specifically stating “*Strategy 5: Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries.*”

### **Goal**

SEAFDEC as gender-responsive and gender-sensitive in pursuing sustainable development and management of fisheries and aquaculture in Southeast Asia

### **Objectives**

The SEAFDEC Gender Strategy strives to mainstream and integrate gender perspectives into the SEAFDEC organization, and in its programs, projects, and activities to ensure that men, women, and youth at all levels, access equitable benefits in the sustainable development and management of fisheries and aquaculture.

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<sup>1</sup> SEAFDEC Member Countries: Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam

<sup>3</sup> UN. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly on 25 September 2015. United Nations General Assembly A/RES/70/1

<sup>4</sup> FAO. (2015). Voluntary Guideline for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication. Food and Agriculture Organization of United Nations. Rome, Italy

<sup>5</sup> SEAFDEC. (2011). Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020. Southeast Asian Fisheries Development Fisheries Center, Bangkok, Thailand

<sup>6</sup> SEAFDEC. (2017). Report of the Special Meeting of the SEAFDEC Council. Southeast Asian Fisheries Development Fisheries Center, Bangkok, Thailand

## Strategies

In order to achieve the objectives, the following strategies shall be implemented:

1. *Mainstreaming Gender at all level of the Organization*
  - 1.1 Implement gender equity and equality in the organization's human resources management and development
  - 1.2 Enhance the awareness and capacity of the human resources at all levels on gender aspects
  - 1.3 Designate and empower the SEAFDEC Gender Focal Persons (SGFP) from all SEAFDEC Secretariat and Departments
2. *Integrating Gender in SEAFDEC Programs and Projects*
  - 2.1 Consider including gender sensitivity aspects in the development of programs and projects
  - 2.2 Integrate gender perspectives throughout the cycle of gender-sensitive programs and projects by:
    - 2.2.1 Incorporating the conduct of gender analysis in the baseline surveys of project sites to understand the gender conditions that require interventions
    - 2.2.2 Providing appropriate interventions to ensure equal opportunities to male and female stakeholders in accessing and receiving benefits from fishery resources, information, financial sources, and capacity building opportunities
    - 2.2.3 Promoting equitable participation of male and female stakeholders in the implementation of programs and projects where applicable
    - 2.2.4 Collecting and compiling sex-disaggregated data throughout the implementation of programs and projects
    - 2.2.5 Conducting impact analysis of the program and project interventions to male and female stakeholders
    - 2.2.6 Integrating gender when disseminating the results from programs and projects
  - 2.3 Advance the capacity of SEAFDEC and Member Countries' staff involved in programs and projects to enable them to integrate gender aspects in the program/project cycle
  - 2.4 Explore possible funding sources to support the programs and projects that address issues on gender in fisheries and aquaculture
3. *Incorporating Gender Perspectives in All-Events Organized by SEAFDEC*
  - 3.1 Ensuring equal opportunities for the participation of male and female representatives from Member Countries and other organizations in all events organized by SEAFDEC
  - 3.2 Collecting and compiling sex-disaggregated data throughout the conduct of all events by SEAFDEC
4. *Boosting the visibility of SEAFDEC as a gender-responsive and gender-sensitive organization*
  - 4.1 Produce articles relevant to gender integration in programs, projects, and activities for SEAFDEC publications and information tools/materials
  - 4.2 Promote the work of SEAFDEC on gender at events organized by SEAFDEC and other agencies
5. *Strengthening Further the Cooperation and Collaboration with Member Countries and Other Organizations on Gender Aspects*
  - 5.1 Participate in meetings, conferences, seminars, and other events on gender organized by the SEAFDEC Member Countries and other organizations
  - 5.2 Invite participation of the Member Countries and other organizations in events organized by SEAFDEC as well as encouraging contributing of articles on gender to SEAFDEC publications

**DRAFT**  
**PROCEDURES FOR INVITING OTHER ORGANIZATIONS AND NON-MEMBER**  
**GOVERNMENTS TO ATTEND THE SEAFDEC COUNCIL MEETING**

**I. BACKGROUND**

In the Agreement Establishing SEAFDEC, the Article 12 on “Co-operation with Other Organizations” states that *“In order to fulfill its purpose, the Center may co-operate 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.”* In line with the Articles 12 and 13 of the Agreement, SEAFDEC has established close cooperation with several other organizations and non-member governments having mutual interest with SEAFDEC, to jointly carry out activities that are beneficial to the SEAFDEC Member Countries.

As the work of SEAFDEC has been expanded to cover a wide range of subjects that are of regional/global interest throughout the past decades, other organizations and non-member governments desiring to establish cooperation with SEAFDEC have also expressed their interest to attend SEAFDEC events, including the SEAFDEC Council Meetings. The 32<sup>nd</sup> Meeting of the SEAFDEC Council held in 2000 therefore adopted the “Guidelines on the Status of Various Organizations and Private Agencies Participation in SEAFDEC Programs” with a view to establishing the principles for inviting other organizations and governments external to the Center to participate in the SEAFDEC activities. Nevertheless, during its 50<sup>th</sup> Meeting in 2018, the SEAFDEC Council viewed that a clearer procedure for inviting other organizations and non-member governments to attend the SEAFDEC Council Meeting is necessary. The SEAFDEC Secretariat was therefore tasked to develop a draft detailed procedures, and submit the document for consideration by the forthcoming 41<sup>st</sup> Meeting of SEAFDEC Program Committee.

**II. OBSERVERS AT THE COUNCIL MEETING**

Based on the Guidelines on the document on “Status of Various Organizations and Private Agencies Participation in SEAFDEC Programs” approved by the SEAFDEC Council at its 32<sup>nd</sup> Meeting on 21-24 March 2000, Malaysia, the observers at the Council Meeting can be limited to:

- 1) The current donors,
- 2) The organizations that have a legal working relationship with SEAFDEC, and
- 3) ASEAN countries but not SEAFDEC Member Countries.

However, other inter-government organizations (IGOs) or Governments by the proposal(s) of the Member Country(s) with the concurrence of all the Council Directors can attend the Meeting.

**III. INVITATION PROCEDURES**

For invitation to be extended to other IGOs or non-member Governments, the procedures shall be as follows:

- 1) The Member Country(s) that wishes to invite other IGOs or non-member Governments to attend the SEAFDEC Council Meeting shall propose to the SEAFDEC Secretariat at least 60 days prior to the Council Meeting, with clear statement on the rationale for attending in the Council Meeting.
- 2) The SEAFDEC Secretariat shall communicate and seek approval from the SEAFDEC Council:



- i. The Secretariat shall send an official letter to all SEAFDEC Council Directors (with an e-copy c.c. to National Coordinators) on the proposal for other IGOs or non-member Governments to attend the Council Meeting, with a clear statement on the rationale for attending the Meeting, at least 45 days prior to the Council Meeting. The Council Directors would be requested to provide a response to the Secretariat by 15 days after the transmittal of the letter.
  - ii. 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.
  - iii. The Secretariat shall keep a record of the decisions made by the Council Directors. The final decision shall be made by a consensus of the Council Directors that send their responses to the Secretariat by the designated date.
  - iv. The Secretariat shall send an official letter to all Council Directors to notify the final decision of the Council.
- 3) The Secretariat shall communicate with the requested Member Country(s) on the result of the decision made by the Councils. Upon the approval of the SEAFDEC Council, the Secretariat shall also send an official invitation letter to the IGOs or non-member Governments to attend the SEAFDEC Council Meeting.
  - 4) The approval of the Council for the-IGOs or non-member Governments to attend the SEAFDEC Council Meeting shall be valid only for its attendance in such a particular meeting for which the request was made.

#### **IV. PARTICIPATION STATUS**

Participation of other IGOs or non-member Governments shall be limited only in the “Open Sessions” as “Observer.”

#### **V. REQUIRED CONSIDERATION BY THE PCM**

The Program Committee is requested to consider the “Draft Procedures for Inviting Other Organizations and Non-member Governments to Attend the SEAFDEC Council Meeting,” and provide comments for the Secretariat to finalize the document, which will be subsequently submitted for consideration by the 51<sup>st</sup> Meeting of the SEAFDEC Council to be held in 2019.

## **A PROSPECTUS OF THE CAPACITY DEVELOPMENT WORKSHOP ON STOCK STATUS ASSESSMENT AND ESTIMATION OF SDG INDICATOR 14.4.1 FOR THE ASIA PACIFIC REGION**

### **Background**

The Sustainable Development Goals (SDGs), officially known as Transforming our world: the 2030 Agenda for Sustainable Development is a set of 17 "Global Goals" with 169 targets between them. Spearheaded 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 September 25–27, 2015 in New York, USA.

Fisheries contribute significantly to global food security, livelihoods and the economy. Fishery resources are extremely vulnerable to environmental degradation, climate change and overfishing. Based on FAO's assessment, the percentage of world marine fish stocks within biologically sustainable levels declined from 90 per cent in 1974 to 69 per cent in 2013. Overfishing does not only reduce food production, but also impairs the functioning of ecosystems and reduces biodiversity, with negative repercussions for sustainable social and economic development.

Considering the significance of fisheries, SDG Target 14.4 demands: "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." The end result of the target is to rebuilt stocks at or above the abundance associated with MSY. It was estimated that rebuilding overfished stocks could increase fishery production by 16.5 million tons and annual rent by US\$32 billion, which could certainly increase the well-being of the coastal communities and lead to healthier ecosystems and greater resilience to climate change and ocean acidification.

UN Member States committed to engage in systematic follow-up and review of implementation of the 2030 Agenda over a 15-year period and placed equal priority on implementation efforts and monitoring progress. Unfortunately, Indicator 14.4.1 - percentage of biologically sustainable fish stocks – cannot be directly calculated based on the catch statistic data of a fishery, but requires stock assessment - a mathematical modelling technique – to estimate fish stock status, which is quite data demanding and skill challenging. Therefore, only about 25% of global catch is not coming from assessed fish stocks, mainly in developed nations. To estimate this Indicator by country, capacity development is urgently needed, especially for many developing countries.

FAO started monitoring the world fisheries resources in 1974, and the resulting assessment has been used as an indicator for the Millennium Development Goal 7 before and now for SDG 14.4. FAO is a custodian agency for SDG Indicator 14.4.1 and has been requested to report progress of this indicator at global level and provide technical support to member states in reporting and monitoring of 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 programme featuring workshops and seminars. This workshop is part of FAO's capacity development effort for the Asia Pacific Region and will be organized in collaboration with the Southeast Asia Fisheries Development Centre (SEAFDEC).

### **Objectives**

The workshop is part of FAO's initiative to support the process of SDGs. Its main objectives are:

- Raising awareness of SDG 14.4.1's significance and global reporting process
- Providing technical training to national practitioners in data requirements, data collection process, stock status assessment methods to estimate Indicator 14.4.1
- Hands-on practices on the stock status assessment method to be developed by FAO

- Guidelines on national assessment and reporting process of Indicator 14.4.1 in compliance with the global requirements and standards

### **Activities**

The workshop will be conducted in an interactive approach to increase its effectiveness. A few major activities are planned tentatively as below:

- Participants will be asked to prepare materials on the general situation and state of marine fishery resources in his/her country, how stock assessment and monitoring have been carried out, and what indicator-related data are available for SDG 14.4.1
- General introduction of SDG 14.4.1: rationale for monitoring, significance, relevance to other SDG indicators, reporting process, current situation, and way forward
- Technical sessions: data requirements, stock status assessment methods that could be used to produce SDG 14.4.1
- The new stock status assessment developed by FAO for the use at country level
- General discussion on the best practice to estimate and report SDG 14.4.1 at global and country levels

### **Outputs**

The workshop is designed to achieve

- Increased awareness of the United Nations' SDG process, in particular Indicator 14.4.1 for countries in the Asia Pacific region
- Improved knowledge on fish stock status assessment and reporting process of Indicator 14.4.1
- Enhanced technical capacity in carrying out country-level stock status assessment
- Know-how to use best practice to estimate stock status and report Indicator, particularly in data poor situations

**Duration of the workshop:** 3-4 days

**Date of the workshop:** second half of 2019 (tentatively depends on other relevant issues)

**Venue:** Bangkok, Thailand

## CLOSING REMARKS

*By Dr. Kom Silapajarn,*  
SEAFDEC Secretary-General

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

The Forty-first Meeting of SEAFDEC Program Committee has come to an end after what appears to be a lengthy three-day discourse. On behalf of the SEAFDEC Secretariat and Departments, I would like to express our sincere appreciation to the members of the Program Committee and to our collaborating partners for imparting to us your wisdom in dealing with the SEAFDEC programs and other significant issues. We are therefore very thankful for your support that made this Meeting attain its objectives. Our gratitude also goes to our staff from MFRDMD and the Secretariat who worked hard to make this Meeting a great success.

As I mentioned in my Opening Remarks, the recommendations that we have adopted in this Meeting, particularly on the programs of SEAFDEC, would be presented to the Twenty-first Meeting of the FCG/ASSP. Afterwards, the output of such Meeting would be raised to the upcoming SEAFDEC Council Meeting for final endorsement and approval, and possible inclusion in the overall activities of SEAFDEC. Once again, we thank all of you for providing us with significant advice and proper guidance in achieving the objectives of this Meeting.

In conclusion, please allow me to extend our wishes to those who will leave this beautiful city before the FCG/ASSP Meeting, for a safe journey back to your homes. For the others, I will see you during the FCG/ASSP Meeting from tomorrow until Friday. I wish you all the best and success in fulfilling the challenges that have been entrusted to us towards the sustainability of fisheries in our region.

With that ladies and gentlemen, I now declare the Forty-first Meeting of the Program Committee closed. Thank you and good day!