

REPORT OF  
THE FORTIETH MEETING OF THE PROGRAM COMMITTEE  
OF THE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

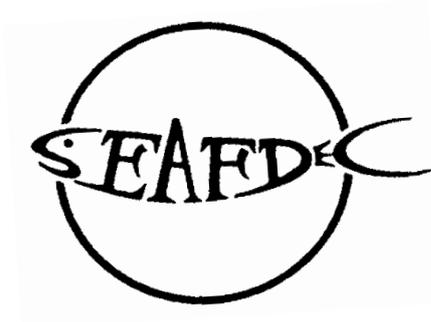
Bangkok, Thailand  
27 - 29 November 2017



THE SECRETARIAT  
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

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**THE SECRETARIAT  
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

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

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## EXECUTIVE SUMMARY

The Fortieth Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Bangkok, Thailand from 27 to 29 November 2017 and hosted by the Marine Fisheries Research Department (MFRD). 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 2017 and scrutinized the programs to be implemented in 2018 to ensure that these have been formulated and implemented in line with the priorities and needs of the Member Countries. The list of SEAFDEC Programs and Activities under the FCG/ASSP Mechanism for 2017-2018 appears as *Appendix 1*.

The Meeting discussed the progress and achievements made by SEAFDEC in the implementation of the **Programs under the FCG/ASSP Mechanism** in 2017, which comprise twenty-three (23) projects, 20 of which have been categorized under five Program Thrusts: 1) Developing and promoting responsible fisheries for poverty alleviation and food security; 2) Enhancing capacity and competitiveness to facilitate international and intra-regional trade; 3) Improving management concepts and approached for sustainable fisheries; 4) Providing policy and advisory services for planning and executing management of fisheries; and 5) Addressing international fisheries-related issues from a regional perspective; two (2) under the “Special Projects”; and one (1) under “New Project”. During the discussion, SEAFDEC was asked to develop KPIs for all its projects to facilitate project evaluation by the Program Committee in the future, and after the deliberations, the Program Committee approved the implementation of the programs, and asked SEAFDEC to take into consideration their recommendations as summarized below:

### ***Program Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security:***

- 1. Human Resources Development (HRD) for Sustainable Fisheries**
  - TD to share with other Member Countries, the lessons learnt from the implementation of the project in pilot sites in Myanmar
  - TD to conduct an evaluation of the project to ensure that its intended objective has been achieved, e.g. improved skills of fisheries officials, increased incomes of fishers
  - TD to expand the project activities after 2018 to include training on EAFM and mobilize the expertise of Malaysia during the training
- 2. Optimizing Energy Use/Improving Safety Onboard in Fishing Activities**
  - TD to conduct follow-up activities after the implementation of training under this project
  - TD to share the technologies developed under this project with the Member Countries to serve as basis for the development of the respective countries’ national standards on energy optimization and safety at sea
- 3. Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia**
  - TD to coordinate with Malaysia in the conduct of a research to compare the efficiency of Fish Aggregated Devices (FADs), Fish Enhancing Devices (FEDs), and Artificial Reefs (ARs)
  - TD to address the requirements of Lao PDR in 2018 through the relevant activities of SEAFDEC
  - TD to involve AQD in the implementation of this project, and invite AQD to attend the Meeting on Resource Enhancement in Southeast Asia in January 2018
- 4. Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources**
  - AQD to collaborate with BFAR for the promotion of environment-friendly aquaculture technologies, including the transfer of such technologies to the private sector in the Philippines
  - AQD to consider refocusing its activities on the aquaculture of *Penaeus monodon* as this is an endemic species to the Philippines, and establish cooperation with BFAR on this aspect through an MOU between AQD and BFAR

- AQD to share with Singapore, the technologies developed through this project particularly on the aquaculture of high-value species
- AQD to involve Malaysian researchers in its research activities on breeding and hatchery seed production of aquaculture species that AQD has been working on, and extend the invitation for Malaysian technical officers to attend the project's 37-day training course

**5. Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia**

- IFRDMD to disclose the data generated through this project to the Member Countries after the Assessment Committee Meeting and Regional Committee Meeting to be conducted by IFRDMD in December 2017 and January 2018, respectively
- IFRDMD to come up with the recommendations on the conservation measures for anguillid eels in Myanmar

**6. Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia**

- IFRDMD to collaborate closely with Myanmar in the implementation of inland fisheries management, and explore the possibility of utilizing its digital library that contains results of research activities on inland fisheries of Myanmar
- IFRDMD to continue developing the standards for data collection of inland fisheries, as well as to consider including under this project the issues on invasive alien species and on determining the carrying capacity of inland water bodies

**7. Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management**

- MFRDMD to consider establishing a link with the ASEAN Commodity Working Group in order to seek funding support for the implementation of the next phase of this project
- MFRDMD to involve the countries that are not participating in this project in the implementation of the new JTF-7 project that will be proposed with features that are similar with this project

***Program Thrust II: Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade***

**8. Chemical 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 to continue following-up with the Philippines and Viet Nam for them to submit the quarterly progress reports of their respective biotoxin monitoring surveys

**9. Cold Chain Management of Seafood**

- MFRD to disseminate the Guidelines on Cold Chain Management for Seafood once the Guidelines has been finalized and published

**10. Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region**

- AQD to consider implementing research on Tilapia Lake Virus under this project; conducting risk assessment of known shrimp diseases across the AMSs; and organizing capacity building activities on animal health epidemiology as a core discipline in disease management

***Program Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries***

**11. Promotion of Countermeasures to Reduce IUU Fishing Activities**

- TD to focus its activities under this project, on the implementation of PSM starting from designated ports, development of mechanism to tackle the issues on transferring raw materials in/out/among countries the region, and development of a database to facilitate across-checking of information from logbook to enhance product traceability.
- TD to coordinate and mobilize the lessons of Thailand on the improvement of traceability system for combating IUU fishing, e.g. VMS, Port-In Port-Out Control (PIPO) Center, Catch Documentation
- TD to continue working closely with FAO in supporting the Member Countries for the implementation of the Port State Measures Agreement (PSMA)

- TD to also involve related agencies other than the Department of Fisheries when conducting the on-site training in Myanmar
12. **Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products**
    - The progress and achievements in the implementation of this project were noted
  13. **Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand**
    - TD to continue updating on the status of the resubmission of the Letter of Agreement for approval by Viet Nam, and implementing the activities on fisheries *refugia* in Viet Nam
    - TD to involve MFRDMD in the implementation of this project, and consider including more target species under this project in the future

***Program Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries***

14. **Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2**
  - TD to coordinate and consult with Cambodia, Thailand and Viet Nam on the planned fisheries and environmental survey in the Gulf of Thailand scheduled in October-November 2018
  - TD to coordinate with Thailand on the appropriate timing for the utilization of either the M.V. SEAFDEC or M. V. SEAFDEC 2 for the conduct of deep sea fishery resource survey in the Andaman Sea in 2018
15. **Offshore Fisheries Resources Exploration in Southeast Asia**
  - The progress and achievements in the implementation of this project were noted
16. **Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in the Southeast Asian Region**
  - TD to coordinate with the national focal point of Viet Nam for identifying the appropriate activities for the portion on “facilitate fisheries activity information gathering through introduction of community-based resources management/co-management” which should focus on rights-based fisheries, as well as the corresponding pilot site
17. **Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region**
  - Member Countries to submit information relevant to the status of purse seine fisheries in their respective countries to MFRDMD for regional analysis
  - MFRDMD to consider incorporating under this project, the study on important shared stocks of the region, *e.g.* Indian mackerels and short mackerels in the Andaman Sea, and Indo-mackerel in the Gulf of Thailand
18. **Research and Management of Sharks and Rays in the Southeast Asian Regions**
  - TD and MFRDMD to avoid duplication of activities in their respective projects that focus on sharks and rays

***Program Thrust V: Addressing International Fisheries-related Issues from a Regional Perspective***

19. **Assistance for Capacity Building in the Region to Address International Trade-related Issues**
  - SEAFDEC to support Viet Nam in developing a system to apply the eACDS for marine fishery products through the existing JTF from 2017
  - SEAFDEC to organize more practical training sessions for fishers on the effective implementation of the eACDS
  - SEAFDEC Member Countries to strengthen their linkage with the ASEAN platform on trade in the future
  - SEAFDEC to consider including the Philippines in the project’ s future activities

- SEAFDEC to consider sharing the results of the pilot testing activities conducted in Brunei Darussalam with Malaysia, include Malaysia as part of the project on eACDS, and to conduct a workshop in Malaysia in 2018
- SEAFDEC to update its synthesis of the development of international fish trade once a year, including providing links to relevant information in the SEAFDEC website, *e.g.* price, international fish trade profile of the Member Countries
- SEAFDEC to develop a platform for sharing of information on trade requirements of importing countries, *e.g.* those of the EU

## 20. **Strengthening SEAFDEC Network for Sustainable Fisheries**

- The Program Committee took note of the information that the joint research and training cruise scheduled to be undertaken by the National University of Fisheries (NFU) of Japan in Viet Nam in 2017 had been cancelled, and that the said activity would be resumed in 2018

### *Special Project*

## 21. **Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia**

- SEAFDEC to continue supporting the activities on promoting bilateral cooperation between Myanmar and Thailand
- SEAFDEC to continue promoting bilateral, trilateral, sub-regional, and regional cooperation among the countries with a view of connecting the national MCS of respective countries into the regional network

## 22. **USAID-SEAFDEC “Oceans and Fisheries Partnership”**

- The Program Committee noted that the USAID/Oceans would attend the internal meeting between Indonesia and USAID/Oceans in Jakarta, and would provide the update on the status of this project in the learning site in Indonesia

### *New Project (starting in 2017)*

## 23. **Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia**

- SEAFDEC to combine the results of the two projects that focus on catadromous eels upon their completion, one of which is being supported by JTF and the other by JAIF, to provide a better picture of the status of eel resources
- AQD to consider extending to the Member Countries, the technology on breeding and culture of this species

The Program Committee also endorsed **Departmental Programs** proposed for 2018 which comprise eight continuing programs from 2017, five of are implemented by AQD, namely: 1) Quality Seed for Sustainable Aquaculture; 2) Healthy and Wholesome Aquaculture; 3) Maintaining Environmental Integrity through Responsible Aquaculture; 4) Adapting to Climate Change; and 5) Meeting Socio Economic Challenges in Aquaculture, and three by TD, namely: 1) Promotion on Strengthening SEAFDEC Visibility and Image; 2) Tailor-made Training Program; and 3) Improvement of Fisheries Technology and Reduction of Impacts from Fishing. The Program Committee provided recommendations on these programs, summarized as follows:

### 1. **Aquaculture Department**

- AQD to collaborate with BFAR on the verification of single spat oyster culture in areas affected by harmful algal blooms (HABs), and in addressing the new global human health concern on Antibiotic Microbial Resistance (AMR) in the aquaculture production chain
- AQD to continue enhancing the accessibility of information emanating from its programs through the AQD website and the SEAFDEC/AQD Institutional Repository
- AQD to coordinate with Thailand in mobilizing the technologies developed for several species to enhance the capacity of the other Member Countries, *e.g.* through training to be organized by SEAFDEC in Thailand or sending of DOF staff to other AMSs to share the technologies

- IFRDMD to put efforts in studying the migration of freshwater species, not only along the mainstream water but also in tributary rivers or streams
- AQD to develop a map of the status of culture of dominant aquatic species in the region, indicating the situation, problems and gaps, and the proposed activities to address the gaps for the next five years, in order to facilitate monitoring of the works undertaken by AQD

## 2. **Training Department**

- TD to support Malaysia in the conduct of Fishing Gear Specialist Training Program to be held in Malaysia in 2018, and to consider including a new area of work on the “marking of fishing gear” in its program
- TD to support the participation of Lao PDR in the training course on fishing gear drawing

The Program Committee also considered and noted the progress of one (1) **Other Program** on **Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region**.

The Program Committee took note of the status of the two (2) **Pipeline Projects**, and provided recommendations as follows:

### 1. **Strengthening the Effective Management Scheme with GIS (Geographic Information System) and RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMSs**

- TD to seek the views of the other SEAFDEC Member Countries in the planning of the project

### 2. **SEAFDEC-EU/CITES Sharks Project Phase II**

- SEAFDEC to consider involving the Philippines in the project; and to provide the methodology for data collection to be used by the country’s enumerators in collecting the actual data

The Program Committee noted the strengthened cooperation between SEAFDEC and non-member governments and international/regional organizations, namely: the FAO Regional Office for Asia and Pacific (FAO/RAP), the Prefectural Inland Fisheries Training Center of Gifu in Japan, Mekong River Commission (MRC), Network of Aquaculture Centres in Asia-Pacific (NACA), Government of Sweden, and the United States Agency for International Development/Regional Development Mission for Asia (USAID/RDMA).

The Program Committee took note of the “Resolution on the Future of SEAFDEC Vision, Mission and Strategies Towards 2030”, which was adopted at the Special Meeting of the SEAFDEC Council on 15 November 2017. With regards to the alignment of the SEAFDEC Programs and projects with the new six (6) strategies under the Resolution, the Program Committee suggested that the activities should be matched or adjusted like that of the Program Framework adopted in 2009; nevertheless, the proposed alignment should be presented to the Council Meeting for their consideration and directive.

With regards to the “Alignment of the Program and Activities of SEAFDEC Departments”, the Program Committee agreed that the current projects would be maintained and continued as approved to avoid encountering any difficulties; and the alignment of the projects would be started with the new projects including those under the JTF-7.

On the “**Japanese Trust Fund-7 Framework**”, the Program Committee Member for Malaysia proposed that two more activities be considered, namely: extension of the Information System on Fish Stock Management (MFRIS), and Minimizing the Pre- and Post-harvest Losses and Wasted along the Supply Chain in Capture Fisheries and Aquaculture. Furthermore, SEAFDEC was requested to study the situation of inland fisheries in the Southeast Asian region, and identify the species that could disappear from the waters of the region.

The Program Committee adopted the **Report of the 40<sup>th</sup> Meeting of the SEAFDEC Program Committee** for submission to the 50<sup>th</sup> Meeting of SEAFDEC Council, and to the ASEAN through the 20<sup>th</sup> Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).

**PROJECTS UNDER THE FISHERIES CONSULTATIVE GROUP OF THE ASEAN-SEAFDEC STRATEGIC PARTNERSHIP (FCG/ASSP) MECHANISM FOR THE YEAR 2017-2018**

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

*Existing Programs*

Program Thrust/Project Title	Lead Department	2017	2018
<b>Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation &amp; Food Security</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. Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources	AQD	Y	Y
5. Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia	IFRDMD	Y	Y
6. Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia	IFRDMD	Y	Y
7. Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management	MFRDMD	Y	N
<b>Thrust II: Enhancing Capacity &amp; Competitiveness to Facilitate International and Intra-regional Trade</b>			
8. 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	Y	Y
9. Cold Chain Management for Seafood	MFRD	Y	Y
10. Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region	AQD	Y	Y
<b>Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries</b>			
11. Promotion of Counter Measures to Reduce IUU fishing activities	TD	Y	Y
12. Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products	MFRDMD	Y	Y
13. Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand	TD	Y	Y
<b>Thrust IV: Providing Policy &amp; Advisory Services for Planning &amp; Executing Management of Fisheries</b>			
14. Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2	TD	Y	Y
15. Offshore Fisheries Resources Exploration in Southeast Asia	TD	Y	Y
16. Enhancing the compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region	TD/SEC	Y	Y
17. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD	Y	Y
18. Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD	Y	Y
<b>Thrust V: Addressing International Fisheries Related Issues from a Regional Perspective</b>			
19. Assistance of Capacity Building in the Region to Address International Trade Related Issues	SEC	Y	Y
20. Strengthening SEAFDEC Network for Sustainable Fisheries	SEC	Y	Y

### *Special Project*

Program Thrust/ Project Title	Lead Department	Period
21. Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia	SEC	2013-2017
22. The Oceans and Fisheries Partnership (USAID Oceans)	SEC	2015-2019

### *New Projects*

Program Thrust/ Project Title	Lead Department	Period
23. Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia	SEC/TD	2017-2018

## **II. Departmental Programs**

Project Title	Department	2017	2018
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. Promotion on Strengthening of SEAFDEC Visibility and Image	TD	Y	Y
7. Tailor-made Training Programs	TD	Y	Y
8. Improvement of Fisheries Technology and Reduction of the Impact from Fishing	TD	Y	Y

## **III. Other Programs**

Project Title	Department	2017	2018
1. Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region	TD	Y	N

## **IV. Pipeline Projects and Emerging Needs for Preparation of Future Project Proposals**

Project Title	Lead Department	Period
1. Strengthening the Effective Management Scheme with GIS (Geographic Information System) and RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMSs	SEC	1-year
2. SEAFDEC-EU/CITES Sharks Project Phase II	SEC	1-year (Jan 18-Jan 19)

Y = Program/project implemented during the year

N = Program/project not implemented during the year

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## LIST OF ACRONYMS

<b>AEG-CITES</b>	ASEAN Experts Group on the Convention on International Trade in Endangered Species of Wild Fauna and Flora
<b>ACDS</b>	ASEAN Catch Documentation Scheme
<b>ACDT</b>	ASEAN Catch Documentation and Traceability
<b>ACIAR</b>	Australian Centre for International Agricultural Research
<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>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>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>IDB</b>	Islamic Development Bank
<b>IFRDMD</b>	SEAFDEC Inland Fishery Resources Development and Management Department
<b>ILO</b>	International Labour Organization
<b>IUU Fishing</b>	Illegal, Unreported and Unregulated Fishing
<b>JAIF</b>	Japan-ASEAN Intergration Fund
<b>JICA</b>	Japan International Cooperation Agency
<b>JTED</b>	Juveniles and Trash Excluder Devices
<b>JTF</b>	Japanese Trust Fund
<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>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>SEASOFIA</b>	Southeast Asian State of Fisheries and Aquaculture
<b>SDGs</b>	Sustainable Development Goals
<b>SOM-AMAF</b>	Senior Officials Meeting of the ASEAN Ministers on Agriculture and Forestry
<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 Environmental Programme
<b>USAID</b>	U.S. Agency for International Development
<b>VMS</b>	Vessel Monitoring System

**REPORT OF THE FORTIETH MEETING OF THE PROGRAM COMMITTEE  
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

**Bangkok, Thailand  
27-29 November 2017**

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**INTRODUCTION**

1. The Fortieth Meeting of the Program Committee (40PCM) of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Bangkok, Thailand from 27 to 29 November 2017 and hosted by the Marine Fisheries Research Department (MFRD).
2. The 40PCM was attended by the SEAFDEC Program Committee Members for Brunei Darussalam, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam together with their respective delegations as well as representatives from collaborating partners, namely: FAO Regional Office for Asia and Pacific (FAO/RAP), Inland Fisheries Training Center of Gifu Prefecture in Japan, Mekong River Commission (MRC), Network of Aquaculture Centres in Asia-Pacific (NACA), Embassy of Sweden in Bangkok, United States Agency for International Development/Regional Development Mission for Asia (USAID/RDMA), and the USAID/Oceans and Fisheries Partnership (USAID/Oceans). The SEAFDEC Secretary-General, Deputy Secretary-General, and Department Chiefs as *ex-officio* members of the SEAFDEC Program Committee together with officers from the SEAFDEC Secretariat and Departments also attended the Meeting. The list of participants appears as **Annex 1**.

**I. OPENING OF THE MEETING**

3. The Chief of SEAFDEC Marine Fisheries Research Department (MFRD), *Mr. Yeap Soon Eong* welcomed the participants to the 40PCM. He expressed his appreciation to the SEAFDEC Secretariat for assisting MFRD in making the necessary arrangements for the Meeting. He mentioned that 2017 is a significant year for SEAFDEC as it celebrated its 50<sup>th</sup> Anniversary. During such occasion, the Special Meeting of the SEAFDEC Council of Directors was convened with the adoption of the “Resolution on the Future of SEAFDEC: Vision, Mission, and Strategies Towards 2030” to support the formulation of SEAFDEC regional programs and activities. In addition, he reiterated that the important function of the PCM is to review the programs of SEAFDEC in 2017 and scrutinize the activities to be implemented in 2018 to ensure that the activities address the requirements of the Member Countries. His Welcome Remarks appears as **Annex 2**.
4. The Secretary-General of SEAFDEC, *Dr. Kom Silapajarn* in his capacity as the Chairperson of the Program Committee, expressed the appreciation to MFRD for hosting the 40PCM. He also thanked the Member Countries for making the celebration of the 50<sup>th</sup> Anniversary of SEAFDEC a successful and memorable one. He indicated that the SEAFDEC Program Committee Members are expected to review the results of the program implemented in 2017 and endorse the proposed program of activities for 2018, and cited that the outputs of 40PCM 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 (ASWGF) as appropriate through the Twentieth Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) to be held back-to-back with the 40PCM. He also encouraged the participants to actively take part in the deliberations and provide recommendations towards promoting the sustainable development of fisheries in the region, and then declared the Meeting open. His Opening Remarks appears as **Annex 3**.

**II. ADOPTION OF THE AGENDA AND ARRANGEMENTS OF THE MEETING**

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

### III. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2017 AND PROPOSED PROGRAMS FOR THE YEAR 2018

6. The Program Committee took note of the twenty projects under the FCG/ASSP Mechanism that have been categorized based on the SEAFDEC Program Thrusts endorsed by the SEAFDEC Council during its Forty-first Meeting in 2009 and two Special Projects. In addition, one new project which started in 2017 was also reviewed. The progress and achievements of the projects in 2017 and the corresponding program of activities proposed for 2018 were 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.

#### 3.1 Programs under the FCG/ASSP Mechanism

7. The Program Committee noted the progress and achievements of the Secretariat and the Departments in the implementation of the various projects in 2017, as well as the activities proposed for 2018 (**Annex 5**). The Program Committee provided recommendations for the improvement of the projects and activities as follows:

##### 3.1.1 Progress of Implementation of Programs under the FCG/ASSP Mechanism in 2017

#### **Program Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security**

##### **(1) Human Resource Development for Sustainable Fisheries**

8. While reiterating that the objective of the project focuses on the well-being of fishers and improving their incomes through value-adding of their catch, the Program Committee Member for Viet Nam expressed the view that there is not much connection between the activities implemented from 2013 to 2019 and the project objective, and sought clarification on how the results of the activities in the pilot sites could be applied in other areas. In response, the representative from TD explained that this project initially focused on the conduct of training courses to introduce the sustainable management approaches to the Member Countries. In order to enhance the project's impact, pilot learning sites were established in Myanmar where the needs of fishers towards the improvement of their incomes were assessed. The result of the pilot activities will be evaluated at the end of the project, and the lessons learned would be summarized and shared with the other Member Countries.

9. While commending TD for the implementation of the project in Myanmar, as it has enhanced the capacity of officers of Department of Fisheries of Myanmar on fisheries management, the Program Committee Member for Myanmar agreed to the activities proposed to be implemented under this project in his country in 2018.

10. The Program Committee Member for Indonesia congratulated TD for its efforts in promoting human resource development in the region and supported the implementation of the project activities proposed for 2018. Nevertheless, he suggested that an evaluation should be conducted to make sure that the project has achieved its intended objectives, *e.g.* the skills of fisheries officers had been improved and income of fishers had increased. In this regard, the representative from TD explained that after conducting the training in the pilot learning sites, an evaluation will be carried out after which the follow-up activities could be planned.

11. While supporting the recommendation of the Program Committee Member for Indonesia, the Program Committee Member for Malaysia explained that baseline information on fishers' income is necessary to evaluate this project. Furthermore, she also indicated that the project activities after 2018 could be expanded to include training on Ecosystem Approach to Fisheries Management (EAFM) and offered to share the expertise of Malaysia on EAFM during the training.

12. In agreeing with the objective of the project on the need to increase the incomes of fishers, the Program Committee Member for the Philippines suggested that the outputs of this project including the lessons learned could be shared with the other Member Countries. She also recommended that a value

supply chain study should be carried out to determine any improvement in the income of fishers. In such study however, baseline information on the income of fishers would be necessary.

13. The Program Committee Member for Indonesia suggested that Key Performance Indicators (KPIs) should be developed not only for this project but for all SEAFDEC projects, to be used for the projects' evaluation. In this regard, SEAFDEC would correspondingly incorporate KPIs in the projects under the new Japanese Trust Fund JTF-7. The 40PCM recommended that henceforth, KPIs should be considered as part of all SEAFDEC projects to facilitate project evaluation by the Program Committee

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

14. The 40PCM was informed that this project aims to promote energy optimization by reducing fuel consumption and minimize carbon emission, and hence the results would not indicate any possible increase in the CPUE. However, the technologies developed under this project, *e.g.* improvement in the design of otter-board to reduce fuel in trawl and hauling devices to reduce labor in purse seine fishing would be promoted in the region.

15. The Program Committee Member for Malaysia expressed the appreciation to TD for conducting the "On-site Training on Optimizing Energy Use and Safety at Sea" on 3-5 October 2017 in Terengganu, Malaysia, as it has strengthened the knowledge of the technical staff on energy saving and safety at sea for small fishing vessels. She suggested that follow-up activities should be conducted under this project.

16. While commending TD for conducting the project, the Program Committee Member for the Philippines requested that the technologies developed under this project should be shared with the Member Countries, so that these could be used as basis for the development of national standards on energy optimization and safety at sea by the respective countries.

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

17. The Program Committee Member for Viet Nam confirmed that the project activity planned to be implemented in Viet Nam in 2017 which had been postponed, would be implemented during the first quarter of 2018 under a cost-sharing scheme.

18. The Program Committee Member for Malaysia reiterated the willingness of Malaysia to collaborate with TD in the conduct of research under this project, particularly in comparing the efficiency between fish aggregating devices (FADs), fish enhancing devices (FEDs) and artificial reefs (ARs), as previously expressed during as the 38PCM.

19. While expressing the appreciation to SEAFDEC for selecting Lao PDR as one of the Project's pilot sites in 2017 of which the activities were postponed to 2018, the Program Committee Member for Lao PDR inquired whether there would be other additional activities in Lao PDR in 2018. In response, TD explained that although there would be no additional activities for Lao PDR under this project, TD would address the requirements of Lao PDR through the other relevant activities that SEAFDEC is implementing, *e.g.* information gathering through community-based management.

20. The Chief of AQD informed the 40PCM that AQD also implements community-based resource enhancement program, focusing on restocking and monitoring of hatchery-bred seeds released in the wild, and expressed the willingness of AQD to collaborate with TD and MFRDMD on this aspect. In this connection, the representative from TD confirmed that AQD would be invited to take part in the Meeting on Resource Enhancement in Southeast Asia in January 2018, which is aimed at updating the status of the resource enhancement activities implemented in the Member Countries and by the SEAFDEC Departments.

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

21. In response to query of the Program Committee Member for Indonesia on whether the sea cucumber seeds used for resource enhancement under this project come from the wild or hatchery-bred, the Chief of AQD explained that the seeds being used come from the AQD hatcheries as AQD had already successfully spawned sea cucumbers using wild stocks and had closed the cycle of reproduction of this commodity.

22. The Program Committee Member for the Philippines informed the 40PCM that the Philippine Government has identified five potential aquatic species for aquaculture, *i.e.* tilapia, seaweeds, shrimps, shellfishes, milkfish, and requested AQD to consider strengthening the collaboration with the Philippine Bureau of Fisheries and Aquatic Resources (BFAR) on the promotion of environmental-friendly aquaculture technologies, including transfer of the technologies to the private sector in the Philippines. While agreeing to address such request, the Chief of AQD informed the 40PCM that the Philippine Government recently re-launched the program “OPLAN Balik SUGPO” considering that for the past decades, *Penaeus monodon* has been out of the sideline since the coming in of *Litopenaeus vannamei* that led to many problems in aquaculture. AQD is therefore considering to focus again on the aquaculture of *P. monodon* since this species is endemic to the Philippines and can mitigate the aquatic disease problems as well. In this connection, AQD would seek the cooperation of BFAR on this aspect through the signing of an MOU with AQD.

23. While expressing the appreciation to SEAFDEC for the efforts it made under this project, the Program Committee Member for Singapore requested that the technologies developed under this project should be shared, particularly on the aquaculture of high-value aquaculture species.

24. The Program Committee Member for Malaysia expressed the interest in the technical development of aquaculture and requested AQD to provide opportunities for Malaysian researchers to join the research activities of AQD on breeding and hatchery seed production of the aquaculture species that it has been working on since Malaysia is also implementing several researches and studies on various aquaculture species. She also requested AQD to extend the invitation to Malaysian technical officers to attend the 37-day training program scheduled in 2018.

#### **(5) Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia**

25. In response to the observation made by the Program Committee Member for Japan that there are activities under this project that are not supported by the JTF, it was clarified that such activities are supported by another project funded by the Japan-ASEAN Integrated Fund (JAIF) starting in 2017. Nevertheless, the 40PCM was assured that both projects are complimentary to each other and not duplicating, since the activities including the surveys under these two projects are conducted in different locations.

26. The Program Committee Member for Indonesia reiterated the request of the Council Director for Japan during the 49<sup>th</sup> Meeting of the Council on the confidentiality policy for the accessibility of data from this project, and inquired when such data could be disclosed to the Member Countries. In response, the Program Committee was informed that after the Assessment Committee Meeting and Regional Committee Meeting to be conducted by IFRDMD in December 2017 and January 2018, respectively, data from this project could be disclosed to the Member Countries.

27. While expressing the appreciation to IFRDMD for the activities proposed to be implemented in Myanmar in 2018, the Program Committee Member for Myanmar requested that this project should also come up with recommendations for conservation measures of anguillid eels in Myanmar. In response, the Chief of IFRDMD explained that although the project initially focuses on data collection, later on it would also cover the development of conservation measures.

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

28. While taking note of the studies on co-management and rights-based fisheries management applicable to inland fisheries conducted in the Philippines and Viet Nam, the Program Committee Member for Myanmar welcomed the possibility of implementing this project also in Myanmar. He informed the Program Committee that Myanmar is willing to collaborate closely with SEAFDEC in the implementation of inland fisheries management. In addition, considering that Myanmar has already established its digital library that contains results of research activities on inland fisheries of Myanmar, the relevant information could now be shared with SEAFDEC and other countries.

29. The Program Committee Member for the Philippines expressed the appreciation to SEAFDEC for giving the opportunity for the Philippines to participate in the implementation of this project. As inland fisheries management is very important in the region, she supported the efforts of SEAFDEC in the development of standards for data collection on inland fisheries. She subsequently highlighted the issue on invasive alien species as one of the major threats to the inland ecosystems, as well as on the need to determine the “carrying capacity” of inland water bodies.

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

30. The Program Committee Member for Viet Nam commended MFRDMD for the implementation of this project that focuses on the improvement of livelihood of the coastal communities through seaweed production and expressed the view that this project should be extended for the next phase implementation. Nevertheless, since the linkage between the seaweed production and marketing is still unclear, she subsequently suggested that for the next phase implementation, SEAFDEC should make a link to the ASEAN Commodity Working Group.

31. The Program Committee Member for Malaysia supported the proposal for the project to be extended until 2018 without additional budget. While adding that the project has benefitted the coastal people in Malaysia, she also supported the recommendation of the Program Committee Member for Viet Nam to extend this project for other Member Countries under the JTF-7. She suggested that MFRDMD should be involved in the project implementation under JTF-7 since it is a continuation of the current project.

32. The Chief of MFRDMD informed the Meeting that although this project is scheduled to be completed by the end of 2017, a request has been made for the extension of the project for another six months. He added that under the JTF-7, a new project will be proposed with features that are similar to this project. The new project would cover the countries that are not participating in the first project.

**Program Thrust II: Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade**

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

33. The Program Committee noted that some project participating countries, *i.e.* Lao PDR, Philippines and Viet Nam, have not yet submitted the quarterly progress reports on their biotoxin monitoring surveys but are in the process of compiling the report. Nevertheless, as for Lao PDR, the Program Committee Member for Lao PDR informed the 40PCM that the survey was not conducted considering that the country has not experienced any problem on biotoxins in its inland fisheries.

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

34. While congratulating MFRD for the completion of project on Cold Chain Management for Seafood, the Program Committee Member for Thailand declared that Thailand is looking forward to the publication of the Guidelines on Cold Chain Management for Seafood and suggested that the Guidelines should be disseminated to the Member Countries.

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

35. While recognizing the importance of fish health management in aquaculture development, the Program Committee Member for the Philippines suggested that AQD should consider including Tilapia Lake Virus in its research activities as this is an emerging disease of high interest. In addition, she also indicated the need to conduct risk assessment of known shrimp diseases across the AMSs as well as on the importation of live shrimp broodstock for aquaculture purposes. Furthermore, she also requested AQD to include under this project capacity building activities on animal health epidemiology as a core discipline in disease management.

36. In this connection, the Chief of AQD explained that since a number of scientific works had already attained technical advancements in addressing fish diseases, AQD will be putting these findings into practical implementation. This will be carried out not only for shrimps, but also for groupers and snappers. Furthermore, the Program Committee was informed that AQD is now in the process of establishing the screening and quarantine procedures in preventing the transboundary spread of aquatic animal diseases.

**Program Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries**

**(11) Promotion of Countermeasures to Reduce IUU Fishing Activities**

37. The Program Committee Member for Viet Nam informed the Meeting that Viet Nam has been notified by the European Commission (EC) for possible identification as non-cooperating third country in fighting IUU fishing, and thus there is a need for the countries in the region to develop strong measures for combating IUU fishing. She also made an observation that during the 39PCM, the activities to be implemented under this project was discussed, but no activities had been planned for 2017. She then suggested that activities under this project in 2018 could focus on the implementation of PSM starting from designated ports, development of mechanism to tackle issues on transfer of raw materials in/out/among countries in the region, and the development of a database to facilitate cross-checking of information from logbook to enhance product traceability.

38. In this regard, the representative from TD informed the 40PCM that no activity was implemented in 2017 as the necessary expertise on port State measures could not be availed of in spite of the requests made with several organizations, *e.g.* NOAA and FAO to provide the resource persons. However, SEAFDEC would be able to avail of the services of the necessary resource persons during the workshop proposed to be conducted in February 2018, which will initially involve the fishery managers. The subsequent workshops later would involve the fishing vessel inspectors.

39. The Program Committee Member for Thailand offered to share the lessons of Thailand through SEAFDEC coordination on the improvement of traceability system for combating IUU fishing, *e.g.* on VMS, Port-In Port-Out Control (PIPO) Center, Catch Documentation.

40. The representative from FAO reiterated the commitment of FAO to continue working closely with SEAFDEC in supporting the Member Countries towards the implementation of the Port State Measures Agreement (PSMA). He added that the support of FAO is not only for countries that ratified the PSMA, but also those countries that are yet to ratify the Agreement.

41. The Program Committee Member for Myanmar suggested that the on-site training conducted by TD should not only target the staff of Department of Fisheries (DOF) but also those from other related agencies. In this regard, the representative from TD suggested that the invitation letter will be sent to the DOF of Myanmar, and the DOF could consider inviting the appropriate agencies to join the training.

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

42. The 40PCM took note of the progress of implementation of the project as presented by the Chief of MFRDMD.

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

43. The Program Committee Member for Malaysia informed the 40PCM on the progress of the activities implemented in the priority *refugia* sites, *i.e.* in Tanjung Leman of Johor State for lobster conservation and Kuala Baram in Sarawak State for tiger prawn conservation. She also mentioned that Malaysia has established a *Refugia* Information Centre in Tanjung Leman to raise the awareness of the public and civil society organizations on the conservation of lobsters in the area.

44. While expressing the appreciation to SEAFDEC for implementing the project, the Program Committee Member for Viet Nam explained that Viet Nam is one of the two countries that have not signed the Letter of Agreement (LoA) as the document was submitted at the same time as the reorganization of new investment law, and that the LoA would be re-submitted for approval. As the legal framework on fisheries *refugia* is a key element for project implementation, she therefore suggested that this activity should be implemented in continuous basis during the project's duration.

45. The Chief of MFRDMD acknowledged the importance of *refugia* concept for resources conservation and management, and expressed the willingness to cooperate in the implementation of the project. He also encouraged TD to consider including more target species in this project in the future.

**Program Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries**

**(14) Fisheries Resources Survey and Operational Plan for M.V. SEAFDEC 2**

46. The Program Committee was informed that the M.V. SEAFDEC 2 is scheduled for maintenance and to be equipped with improved devices and gears with financial support from Japan International Cooperation Agency (JICA) during January – June 2018, and to continue the fisheries and environmental survey in the Gulf of Thailand, and in the EEZs of Thailand, Cambodia, and Viet Nam during October – November 2018.

47. The Program Committee Member for Viet Nam expressed the appreciation to TD for the conduct of the survey on pelagic fisheries in 2017 in Viet Nam waters considering that the result of the survey would contribute to the determination of MSY and composition of small pelagic stocks in the country's waters. For the survey proposed in the Gulf of Thailand in 2018 which would involve three countries, namely: Cambodia, Thailand and Viet Nam, she suggested that a consultation should be convened with the concerned countries for consideration of the proposed survey taking into consideration the respective countries' protocols. In this connection, the representative from TD indicated that the consultation among the concerned countries would be convened in early 2018.

48. The Chief of MFRDMD inquired whether the improvement of the facilities onboard the M.V. SEAFDEC 2 also includes the installation of new scientific eco-sounder. In response, the representative from TD explained that the improvement would be mainly on the deck machinery, towing wire, engine, Global Maritime Distress on Safety System (GMDSS), and navigation system. He also expressed the appreciation to Viet Nam for temporarily installing onboard the M.V. SEAFDEC 2 its own scientific echo-sounder Simrad EK 60 during the survey. However, he added that the use of this equipment needs close cooperation with Vietnamese technical expert for the operation and monitoring of the performance of the equipment.

49. The Program Committee Member for Thailand informed the 40PCM that Thailand is planning to request TD for the use of either the M.V. SEAFDEC or M.V. SEAFDEC 2 for the conduct of deep sea fishery resource survey in the Andaman Sea during March – May 2018. The details of such request would be relayed to TD for coordination on the appropriate timing for the utilization of the vessel.

50. The representative from FAO informed the 40PCM on its plan to conduct fishery resource survey in the Bay of Bengal in 2018 using the marine research vessel R.V. DR. FRIDTJOF NANSEN. He suggested that it would be beneficial for SEAFDEC to participate in the planning of the survey, as the results would be useful for the Member Countries of SEAFDEC.

## **(15) Offshore Fisheries Resources Exploration in Southeast Asia**

51. The Program Committee Member for Indonesia sought clarification on the use of “offshore fisheries” in the project title, the project duration which started in 2004, and on the relationship among the different project objectives. In response, the representative from TD explained that this project is implemented to respond to the directive of the SEAFDEC Council during its 44<sup>th</sup> Meeting for SEAFDEC to conduct collaborative research in the Sulu-Sulawesi Seas and accommodating such activity under this project. On the project’s component on fish handling activities, it was clarified that it would be cost-effective to mobilize the research vessel during its operations in the participating Member Countries, to also conduct onboard training on fish handling using technologies, *e.g.* slurry ice.

52. With regards to the inquiry on definition of “offshore fisheries,” it was clarified that there is no common definition for this terminology among the Member Countries. However, the intention of this project is to conduct surveys in the EEZs of the Member Countries outside of the coastal areas.

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

53. The 40PCM was informed that the activity to “*facilitate fisheries activity information gathering through introduction of community-based resources management/co-management,*” was started before the establishment of IFRDMD. However, from 2017 onward this activity would be undertaken in close collaboration with IFRDMD.

54. In response to the query of the Program Committee Member for Viet Nam with regards to the proposed activity in 2018, the Committee was informed that the activity was developed based on the request made during the 49<sup>th</sup> Meeting of the SEAFDEC Council. After this 40PCM, TD would coordinate with the national focal point to identify the appropriate activities and pilot site.

55. The Program Committee Member for Viet Nam informed the Meeting that after the training activities conducted by TD, the framework for rights-based approach has been incorporated in its national fishery law. She therefore expressed the willingness of Viet Nam to continue the activity under this project with particular focus on rights-based fisheries in line with the current legal framework of Viet Nam.

56. With regard to the activity on “Improving the data collection of the commercially-exploited aquatic and threaten species,” the Program Committee Member for the Philippines expressed the support of the Philippines to the study on stock assessment of sharks and rays considering that several areas of the Philippines have already prohibited the catching, processing and trading of sharks and rays.

57. The Program Committee Member for Indonesia expressed the concern that the activities under this project of TD, *e.g.* capacity building on species identification, and improving data collection on landing of sharks and rays, should not overlap with the project of MFRDMD that also address relevant issues on sharks and rays. In this connection, the representative from TD clarified that while the activities of MFRDMD focused on the biology and species identification of sharks and rays, the activities carried out by TD focus on collection and use of data for stock assessment.

58. Regarding the activity on “Harmonization of fishery statistics in the Southeast Asian region,” the Program Committee Member for the Philippines inquired whether this project also intends to harmonize methodologies for statistics collection among the countries. In response, it was clarified that the aim of this project is to enhance the compilation of statistics through the use of harmonized standards, definition and classification to facilitate submission of statistics from countries.

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

59. In order that a regional analysis of the status of purse seine fisheries in the region could be undertaken in 2018, the Member Countries were encouraged to submit the necessary information to MFRDMD by the end of 2017.

60. The Program Committee Member for Malaysia suggested that research on Indian mackerel and short mackerels in Andaman Sea should be undertaken as these are important shared stocks. The Secretary-General of SEAFDEC also suggested that since the catch of Indo-Pacific mackerel in the Gulf of Thailand was reported to have reduced significantly during the past few years, this case should also be taken into consideration by this project.

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

61. While taking note of the progress of implementation of the project on “Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region”, the Program Committee Member for Malaysia echoed the suggestion of Indonesia for SEAFDEC to avoid duplication of activities among the projects of TD and MFRDMD that have similar focus, *i.e.* on sharks and rays.

**Program Thrust V: Addressing international fisheries related issues from a regional perspective**

**(19) Assistance of Capacity Building in the Region to Address International Trade-related Issues**

61. The Program Committee Member for Viet Nam expressed the appreciation to SEAFDEC for the introduction of eACDS to the stakeholders in Viet Nam in collaboration with the Department of Science, Technology and International Cooperation, from which the output is positive. She proposed that SEAFDEC could also support Viet Nam in the development of a system to apply the eACDS for marine fishery products. In this connection, the 40PCM was informed that SEAFDEC plans to extend support to Viet Nam on this aspect through the existing JTF from 2017.

62. The Program Committee Member for Brunei Darussalam thanked SEAFDEC and Thailand for their support in the pilot site for testing the application of eACDS in Brunei Darussalam. She also mentioned that the system is very useful considering that the country is promoting more exportation of seafood. She therefore urged SEAFDEC to conduct more practical training sessions for fishers for the effective implementation of the eACDS. On trade-related issues and considering that common positions have been developed by SEAFDEC based on scientific information, she suggested that the SEAFDEC Member Countries should strengthen their linkage with the ASEAN platform on trade in the future.

63. The Program Committee Member for the Philippines congratulated SEAFDEC for the achievement in the development of the eACDS which is very useful for ASEAN Member States (AMSs). While informing the Program Committee that the Philippines has already in place a database for catch documentation, he requested SEAFDEC that the Philippines could also be included in the project’s future activities.

64. The Program Committee Member for Malaysia also congratulated SEAFDEC for implementing the eACDS and requested SEAFDEC to share with Malaysia the results of the pilot testing activities conducted in Brunei Darussalam. She also requested that Malaysia be part of the project on eACDS and proposed that a workshop could be conducted in Malaysia in 2018.

65. The Program Committee Member for Indonesia congratulated SEAFDEC for the progress of the eACDS pilot implementation in Brunei Darussalam, and requested SEAFDEC to organize a workshop on eACDS in Indonesia in 2018.

66. The Program Committee Member for Indonesia expressed the view that trade is very dynamic and its progress is difficult to catch up, and suggested that SEAFDEC should exert efforts to update the synthesis on development of international fish trade once a year, including providing links in SEAFDEC website to information, *e.g.* price, international fish trade profile of the Member Countries. In this regard, the representative from the SEAFDEC Secretariat declared that this matter would be discussed among the SEAFDEC Departments especially that this would include information pertaining to the capture fisheries, aquaculture and post-harvest sectors.

67. Considering the importance of information on fisheries trade, the Program Committee Member for Myanmar requested SEAFDEC to develop a platform for sharing of information on trade requirements of importing countries, *e.g.* those of the EU.

68. In responding to the concerns of the 40PCM, the representative from the SEAFDEC Secretariat explained that for the future training and workshop to be conducted in the requesting Member Countries, resource persons from the other AMSs who have experience in dealing with international market issues would be invited in order that the experiences of these other countries with respect to fisheries trade could be shared.

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

69. The Program Committee was informed on the cancellation of the joint research and training cruise in areas under the national jurisdiction of Viet Nam, which was originally scheduled to be undertaken in 2017 by the National University of Fisheries (NFU) of Japan. However, the activity would be resumed in 2018 in collaboration with SEAFDEC, the NFU, and the Research Institute of Marine Fisheries of Viet Nam.

## **Special Projects**

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

70. The Program Committee Member for Myanmar expressed the appreciation to SEAFDEC for supporting the activities to promote the establishment of bilateral cooperation between Myanmar and Thailand, and requested SEAFDEC to continue to support the bilateral cooperation.

71. Regarding the query of the Program Committee Member for the Philippines on the possibility of establishing MCS network among all AMSs, the Program Committee was informed that this project has been moving step-by-step from the establishment of bilateral, trilateral, sub-regional and regional cooperation among the countries. As countries in the region have already had existing national MCS in place, establishment of the aforementioned cooperation would also help connecting the national MCS into the regional network.

72. The Program Committee Member for Myanmar confirmed the invitation for SEAFDEC to implement the pilot activity on the implementation of eACDS in Myanmar.

73. The representative from the SEAFDEC Secretariat added that the implementation of the eACDS also includes MCS. In this connection, the Secretary-General expressed the appreciation to the SEAFDEC-Sweden project through the Swedish Agency for Water and Marine Management (SWaM) for extending support to SEAFDEC in the development of the eACDS.

### **(22) The Oceans and Fisheries Partnership (USAID/Oceans)**

74. The Program Committee Member for the Philippines expressed the appreciation to the USAID/Oceans for selecting Philippines as one of the learning sites, and proposed that the activities in 2018 should be expanded to include the aspect on human welfare in Region 7: Negros Oriental. While taking note of the request, the representative from the USAID/Oceans suggested that results from other projects being implemented in the area that also address the issue on human welfare should also be tapped.

75. The Program Committee Member for Malaysia sought clarification with regards to the expansion site in Kelantan, Malaysia, as there is no workplan developed for the site. In response, the representative from the USAID/Oceans clarified that the project has priority focus in the Sulu-Sulawesi region, and lessons from the learning sites in Philippines and Indonesia would be shared to the other countries in the region. However, for Malaysia the planning meeting scheduled in 2017 would be postponed to early 2018. The representative from the USAID/Oceans also clarified that Malaysia was previously not qualified to receive funding assistance in regards to the project implementation under the eCDT project. However, this restriction has been waived by USAID for Malaysia to receive funding assistance in mid 2017.

76. With regards to the sending of any formal invitation to Myanmar, the Program Committee Member for Myanmar requested the USAID/Oceans to update the names of focal points and not to indicate the specific name in the letter.

77. While expressing the appreciation to USAID/Oceans for the progress of the project implementation in Indonesia, the Program Committee Member for Indonesia requested for an internal meeting between Indonesia and USAID/Oceans in Jakarta to update the status of this project in the learning site in Indonesia.

78. On the development of the Catch Documentation and Traceability (CDT) system, the Chief of MFRDMD sought confirmation on when the CDT system would be ready for use by the countries. In response, the representative from the USAID/Oceans explained that it is not possible to establish one system containing all data that are workable for all countries due to the differences among the countries, *e.g.* situation on capture fisheries, landing, processing exportation, and the CDT system for each country needs to be developed with precise technical specification. The representative from the USAID/Oceans informed the 40PCM that the Member Countries could develop their own eCDT using the documents that were prepared and distributed by USAID/Oceans which provide all the recommendations and guidelines.

### **3.1.2 New Project**

- **Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia**

79. While noting that there are two projects that focus on catadromous eels, one of which is being supported by JTF and the other by JAIF, the Program Committee Member for Japan inquired whether or not the results of the two projects would be combined upon their completion. In response, it was clarified that the two projects complement each other, therefore, combining the results would provide a better picture of the status of eel resources and deliver more benefits for the region.

80. The Program Committee for the Philippines expressed the appreciation to SEAFDEC for involving the Philippines in this project considering that catadromous eel is a high-value species of the country. He then requested AQD to assist in extending the technology on breeding and culture of the species. In response, the Chief of AQD indicated that AQD is in the process of refining the developed aquaculture technologies, *e.g.* improving the survival rate of wild-caught juveniles in aquaculture, which would then be transferred to the Member Countries.

### **3.2 Departmental Programs**

81. The Program Committee took note of the progress and achievements of AQD and TD in the implementation of their respective departmental programs in 2017-2018 (**Annex 6**).

#### **3.2.1 Aquaculture Department**

82. 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) Adapting to Climate Change; 4) Maintaining Environmental Integrity through Responsible Aquaculture; and 5) Meeting Social and Economic Challenges in Aquaculture.

83. The Program Committee Member for the Philippines reiterated the support requested by BFAR from AQD in sustaining the verification of single spat oyster culture in areas affected by HABs, and in addressing the new global human health concern on Antibiotic Microbial Resistance (AMR) in the aquaculture production chain.

84. In response, the Chief of AQD informed the 40PCM that the list of activities proposed by AQD would be adjusted based on the recommendations of the Member Countries and the region's priority. He added that in the upcoming AQD Strategic Planning Meeting in December 2017, stakeholders and relevant agencies in the Philippines would be involved in prioritizing the activities to be undertaken by AQD.

85. With regards to query of the Program Committee Member for Malaysia on the accessibility of information generated from AQD programs, the Chief of AQD explained that the information could be access through the AQD website and the SEAFDEC/AQD Institutional Repository. The Secretary-General of SEAFDEC added that SEAFDEC is planning to establish harmonized repository system that could link the repository of individual Departments to facilitate access to SEAFDEC information in the future.

86. The Program Committee Member for Thailand while commending AQD for the results generated from its works for improving aquaculture technologies especially for marine fish species, emphasized the need for capacity building on freshwater aquaculture which is very important for livelihood and food security in the rural areas. He also expressed the willingness of Thailand to share technologies developed for several species to other Member Countries, *e.g.* through training to be organized by SEAFDEC in Thailand, or sending DoF staff from Thailand to other AMSs to share the technologies.

87. While acknowledging the contribution of freshwater aquaculture to the livelihood of people, the representative from MRC reiterated the importance of migratory fish species which are facing the risks from urban development as well as climate change. She encouraged IFRDMD to also put efforts in studying the migration of freshwater species, not only along the mainstream water but also tributary areas.

88. The Deputy Secretary-General of SEAFDEC shared the information to the 40PCM that under the JICA cooperation, TD and AQD are developing cooperation for the conduct of training course on freshwater aquaculture. The course would involve not only trainees from the AMSs but also from the African region. The SEAFDEC Council would be informed on this matter during its forthcoming annual meeting in 2018.

89. The Program Committee for Indonesia, while congratulating AQD for its achievements, expressed the difficulties in monitoring the works undertaken by AQD considering the amount of works undertaken through the years. He suggested that for next year's report at the 41PCM, AQD should develop a map of status of culture of dominant aquatic species in the region, indicating the situation, problems and gaps, proposed activities to address the gaps for the next five years. The matrix of activities, *e.g.* on broodstock management, breeding, food and nutrition, disease, environment, culture, should be mapped with the situation to facilitate monitoring of the progress of the activities.

90. The Chief of AQD informed the Program Committee on the process of AQD in coming up with matrix to identify problems and develop its 5-year strategic plan. This exercise would also be undertaken in the upcoming Strategic Planning Meeting of AQD on 12-13 December 2017.

### **3.2.2 Training Department**

91. While taking 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 members of the Program Committee provided their recommendations for the improvement of the said programs and activities.

92. The Program Committee Member for Malaysia requested TD to support the conduct of Fishing Gear Specialist Training Program to be held in Malaysia in 2018. In addition, under the project "Improvement of Fisheries Technology and Reduction of the Impact from Fishing," she suggested that TD should consider including new area of work on "the marking of fishing gear" as this was raised during the 2<sup>nd</sup> Sub-regional Technical Consultation between Malaysia and Thailand.

93. The Program Committee Member for Lao PDR requested TD to support the participants from Lao PDR to attend in training course on fishing gear drawing, considering that information on fishing gears is necessary as basis for inland fisheries management.

### **3.3. Other Programs (Annex 7)**

#### **3.3.1 Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region**

94. While informing the 40PCM that IFRDMD is planning to implement project on fish passage in Myanmar, the Program Committee Member for Myanmar sought clarification on the relationship between this IFRDMD project and the existing project implemented by TD. In response, the Chief of IFRDMD explained that the TD project was formulated prior to the establishment of IFRDMD.

95. The representative from SEAFDEC Secretariat added that the TD project which is funded by the Australian Centre for International Agricultural Research (ACIAR) is intended specifically to develop an experimental fishway model to support the conduct of on-station research under controlled conditions and to come up with data on the ability and behavior of different indigenous freshwater fish species to swim across the fishway. The results of the on-station research would be useful for the development of a fishway model that is appropriate for the region.

### **IV. PIPELINE PROJECTS AND EMERGING NEEDS FOR PREPARATION OF FUTURE PROJECT PROPOSALS (Annex 8)**

#### **4.1 Strengthening the Effective Management Scheme with GIS (Geographic Information System) and RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMSs**

96. The representative from MRC expressed the view that this project would come up with information on fish migratory behavior which is necessary to serve as basis for the development of fish passage to mitigate the problems on habitats fragmentation caused by cross-river obstacles or other development projects.

97. The Program Committee was informed that there have been several mapping activities undertaken in the Lower Mekong Basin in the past, the results of which could be considered and utilized in this project as appropriate.

98. In response to the query of the Program Committee Member for Viet Nam on the monitoring of catch data using GIS and remote sensing technologies, and on the species targeted under this project, the representative from TD explained that the research concept for this project is to link between catch data, some environment parameters with remote sensing by using GIS. If the project would choose a pilot site at Nam Oon Dam, Sakhon Nakhon, Thailand, the project could make use of the catch data from the project "Facilitating Fisheries Activity Information Gathering through Introduction of Community-based Resource Management and Co-management" conducted since 2014. The detailed work plan for this project would be established by a working group. In close consultation with the Department of Fisheries of Thailand, the area of Sukothai flood plain located in the north of Thailand was proposed as the pilot site. However, the views of the other SEAFDEC Member Countries would also be sought in the planning of the project.

#### **4.2 SEAFDEC-EU/CITES Sharks Project Phase II**

99. The Program Committee was informed that this Project is a continuation of the previous Project supported by the EU through the CITES Secretariat, with the aim of supporting the SEAFDEC Member Countries in building their national capacities to report the catch and landing of sharks and rays up to species level as well as to facilitate the development of national shark/ray NDFs document. It was also confirmed that the SEAFDEC Secretariat would serve as coordinating unit for this project, while the implementation would be undertaken by MFRDMD in cooperation with TD.

100. The Program Committee Member for the Philippines expressed the country's interest to participate in this project considering that catching of all shark and ray species is prohibited in two Philippine provinces, eventhough there is a lack of substantial population data to support in the localities.

In addition, she requested SEAFDEC to provide the methodology used for data collection, while the actual data collection could be done by the country's enumerators.

101. The Program Committee for Malaysia expressed the appreciation to SEAFDEC for including Malaysia as a participating country in this project and accepted the proposed activities.

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

### 5.1 Food and Agriculture Organization of the United Nations

102. The representative from the FAO Regional Office for Asia and Pacific (FAO/RAP), *Dr. David Brown* thanked SEAFDEC for the invitation extended to FAO to attend the 40PCM. He congratulated SEAFDEC on the occasion of its 50<sup>th</sup> Anniversary and thanked SEAFDEC for the recognition award presented to FAO. He informed the Program Committee that fisheries and aquaculture have been making a significant contribution to food and nutrition security and livelihoods of millions of people around the world. He then expressed his appreciation to SEAFDEC for its contribution in the sustainable development of fisheries in the region through the regional cooperation especially in combating IUU fishing, such as the promotion of the PSMA, ACDS, vessel registration; development of capacity for EAFM, among others. He also expressed the hope for the strengthened collaboration between FAO and SEAFDEC in the future, particularly in key areas, the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries, labor and working conditions, IUU fishing and PSMA, regional cooperation including the BOBLME phase II, Inland Fisheries (IFISH), Inland Fisheries Biodiversity, GEF project in Palembang, Indonesia. He also mentioned that FAO is looking forward to continuing the collaboration with SEAFDEC/AQD on aquaculture related work, *e.g.* AMR and aquaculture feed and feed ingredients, Sustainable Development Goals in particular SDG 14, addressing Intended Nationally Determined Contribution (INDC), and the development of GEF 7 projects in the Lower Mekong Basin, Gulf of Thailand. His Statement appears as **Annex 9**.

### 5.2 Prefectural Inland Fisheries Training Center of Gifu, Japan

103. The representative from the Prefectural Inland Fisheries Training Center of Gifu in Japan, *Mr. Yutaka Nakai*, expressed his appreciation to SEAFDEC for giving him the opportunity to attend the 40PCM. He provided an overview of the fisheries activities and fisheries/aquaculture production of Gifu Prefecture, and introduced the activities undertaken by the Center under the Fisheries Section, Aquaculture Section, and Ecological Environment Section. He specifically highlighted on the importance of "Ayu of the Nagara River System," as the most important fish species in Gifu Prefecture and this is recognized as a Globally Important Agricultural Heritage System (GIAHS) of FAO. He also explained the training activities plan for 2018, and expressed the hope that the AMSs would be able to participate in these activities with the support of the Center. Nevertheless, the extent of support is still being finalized and would be disseminated later to the AMSs. His presentation appears as **Annex 10**.

104. The Committee Member for Thailand expressed the appreciation to the Gifu Prefecture Government through the SEAFDEC cooperation for supporting the effort of Thailand to develop the advance technology for rainbow trout aquaculture, accepting the fisheries biologists from the DOF of Thailand to be trained in Gifu, providing technical assistance to a freshwater station in Chiang Mai, Thailand, as well as extending training opportunity in Gifu for the AMSs. In this regard, the representative from Gifu Prefecture Government expressed the willingness to further the cooperation with SEAFDEC and the Government of Thailand in the future.

105. With regards to the mechanism the for Member Countries to apply for the training course, the 40PCM was informed that the SEAFDEC Secretariat would serve as the coordinator to collect information on the candidates for training and to communicate the training applicants with Gifu. As for the number of trainees in 2018, this would be confirmed after the budget is finalized.

### 5.3 Mekong River Commission

106. The representative from the Mekong River Commission (MRC), *Dr. Phattareeya Suanrattanachai* expressed the appreciation to SEAFDEC for its contribution in strengthening the institutional platforms of the Technical Advisory Body (TAB) on Fisheries for developing and implementing a regional fisheries management and development strategy. She reiterated that the formalization of collaboration between MRC and SEAFDEC through the signing of the MoU on the Promotion of Sustainable Development of Fisheries and Aquaculture in the Lower Mekong Basin and Southeast Asia in August 2017 would foster the research and development of inland fisheries in the countries bordering the Mekong River Basin. She also mentioned that MRC and SEAFDEC would strengthen two important functions which are on consultancy and human resource management. Specifically, two events are scheduled in December 2017 with the purpose of formulating a project-based action plan for Mekong Basin-wide Fisheries Management Strategy (BFMS) and enhancing capacity on Ecosystem Approach to Fisheries Management (EAFM) for senior fisheries managers. Her Statement appears as **Annex 11**.

### 5.4 Network of Aquaculture Centres in Asia-Pacific

107. The representative from Network of Aquaculture Centres in Asia-Pacific (NACA), *Dr. Eduardo M. Leão*, thanked SEAFDEC for the invitation extended to NACA to participate in its 40<sup>th</sup> PCM. He reiterated on the signing of MoU between NACA and SEAFDEC/AQD in May 2016, and expressed the appreciation to the participation of SEAFDEC staff in several important events that addressed different aquaculture issues during the past years, *i.e.* on Sustainable Intensification of Aquaculture in the Asia-Pacific Region in February 2015; the Regional Consultation on Responsible Production and Use of Feed and Feed Ingredients for Sustainable Growth of Aquaculture in Asia-Pacific in March 2017; the 9<sup>th</sup> China International Shrimp Industry Development Forum in April 2017; Strengthening Capacities, Policies and National Actions Plans on Prudent and Responsible Use of Antimicrobial in Fisheries in August 2017; and Emergency Regional Consultation for Prevention and Management of Tilapia Lake Virus (TiLV) in the Asia-Pacific in September 2017. In addition, NACA also participated in the ASEAN Regional Technical Consultation on EMS/AHPND and Other Transboundary Diseases which was recently organized by AQD. He also reiterated that NACA and SEAFDEC will continue to collaborate and explore opportunities to implement projects toward sustainability and further development of aquaculture industry in the region. His Statement appears as **Annex 12**.

### 5.5 Government of Sweden

108. The representative from the Embassy of Sweden in Bangkok, Thailand, *Ms. Louise Herrmann* congratulated SEAFDEC and the Member Countries for their efforts to implement the activities and results achieved in 2017. She also appreciated the recognition award given by SEAFDEC to the Government of Sweden on the occasion of the 50<sup>th</sup> Anniversary of SEAFDEC. In line with the support from Sweden, she highlighted the key achievements on the regional collaboration including the Regional Plan of Action (RPOA)-Neritic Tunas and the RPOA-Fishing Capacity which was endorsed by the ASEAN High Policy Levels. Furthermore, she also recognized the long-term partnership between Sweden and SEAFDEC, and other partners, *e.g.* the cooperation with FAO on the regional approach to the implementation of the FAO Small-Scale Fisheries Guidelines including the principles of human rights and gender equity; the cooperation with ILO on principles for good labor practices in fisheries; and the cooperation with JTF, FAO, and USAID on the implementation of PSM, ACDS, and traceability schemes. Her Statement appears as **Annex 13**.

109. The Program Committee Member for Thailand expressed the appreciation to the SEAFDEC-Sweden Project for supporting the conduct of Sub-regional Consultative Workshop of the Northern Andaman Sea/Myeik Archipelago, which helps in increasing the effectiveness of several collaborative projects implemented by Thailand in Myanmar. He also expressed the appreciation to SEAFDEC for its continued effort under the SEAFDEC-Sweden Project to support regional collaborative programs, and the national efforts in addressing fisheries management, and the management of fishing capacity in the region.

## 5.6 USAID/Regional Development Mission for Asia

110. The representative from the United States Agency for International Development/Regional Development Mission for Asia (USAID/RDMA), *Ms. Cristina Velez Srivanasan* thanked SEAFDEC and its Member Countries for the opportunity to participate to 40PCM. She also extended her gratitude to the Government of Thailand for its hospitality and leadership in hosting this important meeting and to the Japanese Trust Fund, Government of Sweden, FAO and the Global Environment Facility for ongoing collaboration and support for the USAID/Oceans and Fisheries Partnership. She is convinced that there is a great need to manage the fisheries of Southeast Asia urgently and immediately. With USAID/Oceans' efforts, the development of traceability solutions can represent key elements to reducing IUU fishing and improving fisheries management. She further informed the Meeting on the great progress made during last two years, *i.e.* development of three regional sustainable fisheries management plans for Sulu Sulawesi Seas, the Andaman Sea and the Gulf of Thailand, expansion of the dialogue on catch documentation and traceability including developing technical standards, identifying key data elements and creating common definitions to facilitate information capture, development of national relevant CDT solutions. Furthermore, the awareness and mobilized support have also been expanded to prioritize gender equality and fair labor concerns. She stated that USAID recognizes SEAFDEC for its outstanding leadership and greatly contributes to the progress and success of the project. The USA Government is committed to work on removing IUU fishing from supply chains through the new U.S. Seafood Import Monitoring Program. Meanwhile, NOAA as supported by USAID will continue to engage in building capacity to respond this new rule, as well as on the Port State Measures Agreement. She also added that USAID would engage with CTI-CFF, RFMOs, FAO and others to synergize efforts. Through the ASEAN-SEAFDEC platform, implementing of CDT model will be applied and adapted to the varying needs across the region. Lastly, USAID looks forward to deeper engagement and collaboration with SEAFDEC in the future. Her Statement appears as **Annex 14**.

111. The Secretary-General expressed the appreciation to the collaboration extended by USAID starting with the project on Oceans and Fisheries Partnership, which has later on been expanded to other initiatives of US agencies such as those of the Department of Interior and NOAA. SEAFDEC therefore look forward to having enhanced cooperation with USAID in the future.

## VI. OTHER PROGRAM MANAGEMENT MATTERS

### 6.1 Adopted Resolution on the Future of SEAFDEC: Vision, Mission, and Strategies Towards 2030

112. The Program Committee noted the adopted Resolution on the Future of SEAFDEC: Vision, Mission, and Strategies Towards 2030 (RES2017), which was adopted at the Special Meeting of the SEAFDEC Council on 15 November 2017 (**Annex 15**). In this connection, the Program Committee Member for Indonesia urged that SEAFDEC should start to harmonize the programs according to the Resolution.

113. While seeking the advice from the Program Committee on the next step in order to align the SEAFDEC programs and projects with the new six (6) strategies after the adoption of the RES2017, it was suggested the activities should be matched or adjusted like that of the Program Framework adopted in 2009. Nevertheless, the Program Committee Member for Viet Nam emphasized that the proposed alignment would be presented to the Council Meeting for their consideration and directive.

114. The Program Committee Member for Myanmar suggested that the adjustment of activities to the new strategies should consider matching the suitable group, however, it should reflect the current situation and support the new six strategies.

115. In this respect, the 40PCM took note that the proposal will be submitted to Council Meeting in 2018.

## 6.2 Alignment of the Programs and Activities of SEAFDEC Departments

116. After the presentation of the representative from the SEAFDEC Secretariat on the background of the programs of work (**Annex 16**), the Program Committee for Myanmar encouraged TD and MFRDMD as well as the other Departments to work together closely especially in the alignment of the scope of works for effective project implementation. He added that the program of works should be aligned with the requirements and/or request of the Member Countries, *e.g.* inland aquaculture with the support of the Department of Fisheries of Thailand.

117. While congratulating the SEAFDEC Secretariat for coming up with very comprehensive listing of the past projects, the Program Committee Member for Singapore observed that some projects are quite similar in scope that have been repeated. He therefore suggested that in formulating a new project, a review of the past projects of similar nature should be undertaken to optimize the resources.

118. In order to minimize the overlapping of the scopes of works among SEAFDEC Departments, the Program Committee Member for Indonesia suggested that SEAFDEC Secretariat should take the lead role on cross-cutting issues while each Department will be responsible for their functions as approved by the SEAFDEC Council. Moreover, based on the suggestion of the Program Committee Member for Indonesia, the 40PCM agreed that the current projects would be maintained and continued as approved to avoid encountering any difficulties. The alignment of projects would be started with the new projects including JTF-7.

119. The 40PCM noted that the alignment of programs and activities of SEAFDEC Departments would be discussed during the forthcoming Department Chiefs' Meeting. Results of the discussion would be submitted for consideration of the forthcoming Meeting of the SEAFDEC Council as necessary.

## VII. OTHER MATTERS

### 7.1 Japanese Trust Fund-7 Framework

120. The Program Committee took note of the draft Japanese Trust Fund 7 (JTF-7) Framework together with project proposals developed by the Secretariat and Departments (**Annex 17**). The Program Committee noted that a new JTF-7 will start in 2020 with the duration of approximately 5 years. In order to request for approval for this new JTF-7, SEAFDEC needs to submit the documents for consideration by the Government of Japan in December 2017.

121. In response the query of the Program Committee Member for Singapore on the harmonization of statistics standards under the project on Harmonization and Enhancing Utilization of Fisheries Statistics and Information, the Committee was informed that this is in relation to the modification of standard classification of fishery statistics which is expected to be adopted by FAO in 2019, and used as new framework for countries to submit statistics for compilation at global and regional levels in the future.

122. With regard to the project on "Market Measures for Combating IUU Fishing in the Southeast Asian Region", the Program Committee was informed that this project was initially developed under JTF-6 which focused on the establishment and implementation of the guidelines to prevent entry of IUU fish and fishery products, but this phase of the project will focus on strengthening the efforts to combat IUU fishing and develop a non-IUU labeling for fish and fishery products in the region.

123. The Program Committee also took note that TD would continue the Project on "Responsible Technology and Practice for Sustainable Fisheries". However, this project should be placed under the Component of Pillar 2: Conservation and management of aquaculture resources and ecosystem.

124. The Program Committee Member for Malaysia proposed two more activities under this project. The first activity is on the extension of Information System on Fish Stock Management (MFRIS) that would integrate all fishery survey data in one database to other Member Countries; while the second activity is on minimizing the pre- and post-harvest losses and wastes along the supply chain in capture fisheries and aquaculture (inland and marine) which is complementing the Regional Guidelines for Responsible Fisheries in Southeast Asia: Post-harvest Practices and Trade. Considering that the JTF-7 and

all corresponding projects have already been discussed and finalized, the proposed activities of Malaysia should be informed to the Japanese Government separately.

125. The Program Committee Member for Indonesia requested SEAFDEC to study the situation of inland fisheries in the Southeast Asian region, and identify the species that could disappear from our waters in the next five years. The study could form a basis for management options to conserve these disappearing species in the region.

126. The Program Committee Member for Japan explained that as the process to request budget for JTF-7 has not been started, it is not possible to confirm the budget at this stage that cover all the proposed activities. However, Japan took note of the request and expressed intention to make effort to acquire budget that meet the needs indicated proposal. The Program Committee was also informed that the Fisheries Agency of Japan received comments from the Ministry of Finance that there are too many project items under the current JTF. Although Japan understands that there are several important activities for the region, but in terms of preparation of the request for budget allocation, the structure of the proposal for the JTF-7 should be simple. In response, it was clarified that the number of projects should be maintained despite additional request of Malaysia.

127. The Program Committee Member for Indonesia expressed the view that follow-up actions undertaken by SEAFDEC in response to directive of the SEAFDEC Council should be reported at the SEAFDEC Program Committee, FCG/ASSP, and SEAFDEC Council Meetings.

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

### **8.1 Adoption of Report of the Meeting**

128. The Program Committee adopted the recommendations of its Fortieth Meeting on 29 November 2017. The Program Committee noted that the Report would be submitted to the 50<sup>th</sup> 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-first Meeting of the Program Committee**

129. In considering the date and venue of the Fortieth Meeting of the Program Committee, the Chief of Marine Fishery Resources Development and Management Department (MFRDMD) informed the Program Committee that MFRDMD would host the Forty-first Meeting in Malaysia. He also informed the Program Committee that MFRDMD would seek the guidance of the Secretariat in finalizing the schedule and related arrangements for the Meeting.

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

130. In his Closing Remarks, the Chairperson of the Program Committee expressed sincere appreciation to the Program Committee Members, representatives of the collaborating organizations, SEAFDEC Secretariat and Departments, as well as observers for imparting their wisdom in dealing with SEAFDEC programs and significant issues and for their support that made the 40PCM attain its objectives. After expressing the gratitude to MFRD and the Meeting Secretariat for their meticulous efforts to make this Meeting successful, he then declared the Fortieth Meeting of the SEAFDEC Program Committee closed. His closing address appears as **Annex 18**.

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Representatives from SEAFDEC's Collaborating Partners,

Ladies and Gentlemen,  
Good morning,

It is indeed a great honor for me to give the welcome remarks for this 40<sup>th</sup> Meeting of the SEAFDEC Program Committee. It is my great pleasure to welcome all of you to this important meeting in the SEAFDEC calendar.

Ladies and Gentlemen, we consider 2017 a significant year for SEAFDEC as it recently celebrated its 50<sup>th</sup> Anniversary in Bangkok on 15 November 2017. In addition, on that occasion, the "Resolution on the Future of SEAFDEC: Vision, Mission, and Strategies Towards 2030" was adopted by the Special Meeting of SEAFDEC Council affirming the need to support the Member Countries of SEAFDEC in the implementation of regional programs and activities; to enhance cooperation with the ASEAN under the ASEAN-SEAFDEC Strategic Partnership (ASSP) framework; as well as to support implementation of activities under the ASEAN-SEAFDEC FCG mechanism taking into consideration the "Strategic Plan of Action on ASEAN Cooperation in Fisheries 2016 to 2020".

Ladies and Gentlemen, in the next three days, we have the important task to deliberate on and review the progress and accomplishments of the SEAFDEC programmes and projects conducted in 2017 as well as the proposed programmes for 2018. I would therefore seek your active participation to seriously consider, scrutinize and, when and where necessary, make constructive assessment and recommendations taking into consideration the needs, priorities and requirements of the Member Countries.

Finally, on behalf of all of us here, I would like to express my utmost thanks and appreciation to the SEAFDEC Secretariat for assisting MFRD to host this meeting in Bangkok by making all necessary arrangements for a comfortable and conducive meeting venue in this grand hotel. I also wish all of you a pleasant stay in Bangkok and sincerely hope for us to have a fruitful and productive meeting.

Thank you.



## OPENING REMARKS

*By Dr. Kom Silapajarn  
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Representatives from our Collaborating Partners,

Ladies and gentlemen,

Good morning and welcome to the Fortieth Meeting of SEAFDEC Program Committee here in Bangkok, Thailand.

Before anything else, I would like to thank everyone for your time and efforts to make the celebration of our Fiftieth Anniversary successful and a truly memorable one. For this year's Meeting of the SEAFDEC Program Committee, please allow me to thank MFRD for hosting this Meeting although it is convened here in Bangkok.

Ladies and gentlemen, as in the previous Meetings of the Program Committee, our discussion would begin with the agenda on Programs under the FCG/ASSP Mechanism that have been grouped under the Program Thrusts of the SEAFDEC Program Framework adopted by the SEAFDEC Council in 2009. The succeeding agenda would be Departmental Programs and Other Programs. The Program Committee is expected to review the results of the programs implemented in 2017 and endorse the proposed program activities for 2018.

As indicated in the Terms of Reference of the SEAFDEC Program Committee, their assessment of the programs and activities of SEAFDEC would guarantee that the issues and concerns of the Member Countries are dealt with effectively. Also, to our collaborating partners, we 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 objectives as of 2017 and the activities proposed for 2018. The presentations also include the results as recommended by the Program Committee during its 39<sup>th</sup> Meeting in 2016 and endorsed by the SEAFDEC Council at its 50<sup>th</sup> Meeting last April. We would like to assure you 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.

At the end of this Meeting, the outputs 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 Twentieth 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 sustainable development of fisheries in our region and in cultivating the role of fisheries in the unified ASEAN Economic Community.

With that note, ladies and gentlemen, I now declare the Fortieth 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 2017 and Proposed Programs for the Year 2018

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

#### **3.1.1 Program Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security**

- Human Resources Development (HRD) 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
- Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources
- 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

#### **3.1.2 Program Thrust II: Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade**

- 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
- Cold Chain Management for Seafood
- Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region

#### **3.1.3 Program Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries**

- Promotion of Countermeasures to Reduce IUU Fishing Activities
- Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products
- Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand

#### **3.1.4 Program Thrust IV: Providing Policy and Advisory Services for Planning & Executing Management of Fisheries**

- Fisheries Resources Survey and Operational Plan for M.V. SEAFDEC 2
- 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

**3.1.5 Program Thrust V: Addressing International Fisheries-related Issues from a Regional Perspective**

- Assistance of Capacity Building in the Region to Address International Trade-related Issues
- Strengthening SEAFDEC Network for Sustainable Fisheries

**3.1.6 Special Project**

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

**3.1.7 New Project**

- Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia

**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

*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

**3.3 Other Programs**

- Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region

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

- 4.1 Strengthening the Effective Management Scheme with GIS (Geographic Information System) & RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMSs
- 4.2 SEAFDEC-EU/CITES Sharks Project Phase II
- 4.3 Others to be updated as subject to Departments' feedback

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

**Agenda 6:** Other Program Management Matters (Closed Session)

- 6.1 Adopted Resolution on the Future of SEAFDEC: Vision, Mission, and Strategies Towards 2030
- 6.2 Alignment of the programs and activities of SEAFDEC Departments

**Agenda 7:** Other Matters (Closed Session)

- 7.1 Japanese Trust Fund-VII Framework
- 7.2 Other

**Agenda 8:** Conclusion and Recommendations of the Fortieth Meeting of the Program Committee

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

**Agenda 9:** Closing of the Program Committee Meeting



**PROJECTS UNDER THE FISHERIES CONSULTATIVE GROUP  
OF THE ASEAN-SEAFDEC STRATEGIC PARTNERSHIP (FCG/ASSP) MECHANISM  
FOR THE YEAR 2017-2018**

**I. Existing Program**

Program Thrust/Project Title	Lead Department	2017	2018	Appendix No.
<b>Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation &amp; Food Security</b>				
Human Resource Development for Sustainable Fisheries	TD	Y	Y	1
Optimizing Energy Use/Improving Safety Onboard in Fishing Activities	TD	Y	Y	2
Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia	TD	Y	Y	3
Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources	AQD	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
<b>Thrust II: Enhancing Capacity &amp; Competitiveness to Facilitate International and Intra-regional Trade</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	MFRD	Y	Y	8
Cold Chain Management for Seafood	MFRD	Y	Y	9
Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region	AQD	Y	Y	10
<b>Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries</b>				
Promotion of Counter Measures to Reduce IUU fishing activities	TD	Y	Y	11
Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products	MFRDMD	Y	Y	12
Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand	TD	Y	Y	13
<b>Thrust IV: Providing Policy &amp; Advisory Services for Planning &amp; Executing Management of Fisheries</b>				
Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2	TD	Y	Y	14
Offshore Fisheries Resources Exploration in Southeast Asia	TD	Y	Y	15
Enhancing the compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region	TD/SEC	Y	Y	16
Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD	Y	Y	17
Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD	Y	Y	18
<b>Thrust V: Addressing International Fisheries Related Issues from a Regional Perspective</b>				
Assistance of Capacity Building in the Region to Address International Trade Related Issues	SEC	Y	Y	19
Strengthening SEAFDEC Network for Sustainable Fisheries	SEC	Y	Y	20

## II. Special Projects

Program Thrust/ Project Title	Lead Department	Period	Appendix No.
Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia	SEC	2013-2017	21
USAID-SEAFDEC “Oceans and Fisheries Partnership”	SEC/TD	2015-2019	22

## III. New Projects

Program Thrust/ Project Title	Lead Department	Period	Appendix No.
Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia	SEC/TD	2017-2018	23

Y = Program implemented during the year

N = Program not implemented during the year

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

	Project id: 201301001		
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
<b>Project Title:</b>	Human Resource Development for Sustainable Fisheries		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	2013-2019
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	All AMSs
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 333,290
<b>Project Partner:</b>		<b>Budget for 2018:</b>	USD 68,201
<b>Project Leader:</b>	Panitnard Taladon	<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 Essential Ecosystem Approach to Fisheries Management (E-EAFM) and Fisheries Extension Methodologies training courses' participants from each country during the way forwards sessions. That is one of the activities in each training course, conducted by TD in the year 2014 and 2015. In this year of 2016, the project have reviewed on the needs of each proposed pilot for learning site, in focusing to improve the income of fishers through the fisheries activities, so that the year of 2016 and 2017, the human capacity building for improvement of income of fishers through the fisheries activities as a part of fisheries extension work is proposed to be implemented at a pilot-learning sites in Myanmar, the result and lesson learned of this will be used to share for adaption for other member countries in the following years .

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 2011emphazises; 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 the project, TD would like to follow up and giving more specific support to each of the member country through the sub-project implementation at the selected learning site, with aiming to intensive building up of the country's target fisheries officers.

### 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	<p>- 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:</p> <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> <p>- There were two participants from each country participated in each training course. In parallel with the regional training courses, SEAFDEC also supported MCs in conducting national training course which base on the need and request from MCs. The courses are conducted as tailor-made training program. Each of the training course program is designed base on the need and real situation of the country.</p>
Intensive Human Resource Development on Sustainable Fisheries Management and Follow up activities	<p>- 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.</p>
Production of promotion and training materials	<p>- The promotion materials including lesson learned of the project activities have been producing and distributing to the related sectors.</p>
Project evaluation	<p>- 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.</p>

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

(Unit: USD)

	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 Inland Fisheries of the Southeast Asian Region							

	Proposed Budget (USD)						
	2013	2014	2015	2016	2017	2018	2019
- 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				42,350	45,300	68,201	18,500
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	
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	
6.5 Training/workshop on development of the improvement of income 's fishers work plan					12,850	10,000	
6.6 Training course or study visit to Thailand or Japan 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	
6.7 Follow up on the working progress of the project at the pilot-learning					6,400	6,400 & 4,051	6,400
6.8 Workshop on the activities result and reporting on the lesson learned which will be used for others pilot-learning sites in next following years of the project					12,250	12,250	12,250
7. Production of promotional and training materials	2,000	2,000	2,000	2,350	300	0	800
8. Evaluate of the HRD activities and find way forwards							25,850
	<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>45,300</b>

**PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION****1. Achievements of the Project Implementation for the Present Year 2017**

In focusing to improve the income of fishers through the responsible and sustainable fisheries activities, in the year 2017, 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 was implemented at the pilot-learning sites in Thahton Township, Mon State, Myanmar. A 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 (7-9 December, 2016)	workshop	DOF-Myanmar 12	6	-	13,290
2. Workshop on key stakeholder's engagement and investigate the current situation which lead to the low income of the fishers of the project sites (24 – 26 April 2017)	workshop	DOF-Myanmar 13	6	Local stakeholders 13	18,000
3. Specific Survey on the appropriate activities to increase income for the Fisheries communities in learning site (18-21, July 2017, Thahton Township, Mon State, Myanmar)	survey and workshop	DOF-Myanmar 9	6	Local stakeholder 4	12,700
4. Workshop on the development of the fisheries management for Thahton Township, Mon State, Myanmar and study visit to the existing methods to increase income for the fisheries community (21-24 November 2017, Surat Thani, Thailand)	Workshop and study visit	DOF-Myanmar 12	6	DOF/Thailand 2	23,850

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

Planned activity	Expected outcome/output	Achievements
Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders	<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 DG of Myanmar and met with the national coordinator as well as others key officers for the HRD project implementation at a pilot- learning site in Myanmar</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>

<b>Planned activity</b>	<b>Expected outcome/output</b>	<b>Achievements</b>
Workshop on key stakeholder's engagement and investigate the current situation which lead to the low income of the fishers of the project sites 24 – 26 April 2017	- List of the real issues in leading to the low income of the fishers in the Thahton Township, Mon State	- Conducted a three days' workshop to engage key stakeholders, - 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
Specific Survey on the appropriate activities to increase income for the Fisheries communities in learning site, 18-21, July 2017, Thahton Township, Mon State, Myanmar	- The team of DOF/Myanmar found out that in the Thahton Township, there are the opportunity to increase income of the fishers through several activities which are related to the muddy crabs, and fish processing. These can be done through the enhancement of the muddy crab stock in the wetland as well as the introduction on the use of the responsible and selective crab traps, furthermore training on the fish processing methods can also be introduced, etc.	The specific survey was made to find out for the appropriate activities to increase income for the fishers,
Workshop on development of the fisheries management plan for Thahton Township, Mon State, Myanmar, 21-24 November 2017 at Surat Thani, Thailand	- Draft of the fisheries management plan which focusing to increase the income of the fishers through the responsible fisheries.	Conduction of 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 results on the specific issues and the opponent in increasing the incomes for the communities which found out as of the pilot-learning site. (will be conducted in October)
Follow up on the working progress of the project at the pilot-learning site.	- Fishers and community's members be introduced on the use of the responsible and selective crab traps and be introduced on the methods of fish processing, etc.	A local training course will be conducted by the key officers and key stake holders. The content of the course will be based on the results from the improvement of income 's fishers work plan

#### 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 on the Initiative workshop with key persons for the project, visit to the selected project site and prioritize of the key stakeholders	e-file	
2. 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 (24 - 26 April 2017)	e-file	

<b>List of completed publications for the year 2016</b>	<b>Type of media</b>	<b>Attached e-file</b>
3. Report of the Specific Survey on the appropriate activities to increase income for the Fisheries communities in learning site (18-21, July 2017, Thahton Township, Mon State, Myanmar)	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 (key officers and key stake holders) has 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 communicating with the key target officers and the key stakeholders in the learning site. However, we still can cope up with this challenge.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2018

### 1. Proposed Activity/Sub-Activity, Work Plan and Estimated Budget for the Year 2018

<b>Proposed Activity</b>	<b>Description of Proposed Activity</b>	<b>Proposed Budget (USD)</b>
Activity 1: Initiative workshop with key persons for the pilot projects and learning sites and visit to the selected project sites (based on the request)	- Courtesy call to the DG of the request country and meet with the national coordinator as well as others key officers for the HRD project implementation at a pilot- learning site - Consultation and selection of the specific pilot-learning site - Visit and observation to the selected pilot-learning site and identify and prioritize the key stakeholders	7,500
Activity 2: Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites	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	10,225
Activity 3: Training –workshop on Base-line survey on fisher's income and relevance data/information collection (in collaboration with Socio-economic section)	The training-workshop will be conducted for 3 days this aim to introduce existing methods for base line survey on fisher's income and others relevance data as well as discuss on the appropriate methods for the gathering data/ information as base-line survey, key stakeholders are expected to do the base-line survey and gathering the existing data and information through the collaboration with sectors concern	9,700
Activity 4: Training/workshop on development of the improvement of income 's fishers work plan	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	10,000

Proposed Activity	Description of Proposed Activity	Proposed Budget (USD)
	related to the specific issues which found out from the activities 3 of the pilot-learning site.	
Activity 5: Training course or study visit to Thailand or Japan on improvement of income of fishers through responsible fisheries activities and value adding on the fisheries products and to observe effective and appropriate methods in adding high value in fish products	The training course will be conducted in Thailand; the key stakeholders will be invited for the course and study visit to observe the existing activities of Thailand in adding the value of fish catches which can be from capture or culture. Or the key stakeholders will be invited to study visit and observe on the tips/ techniques and methods for value adding of the catch	8,075
Activity 6: Follow up on the working progress of the project at the pilot-learning (2019)	SEAFDEC team visit to the pilot-learning site in country for monitoring and evaluation of the work implementation	6,400
Activity 7: Workshop on the activities result and reporting on the lesson learned which will be used for others pilot-learning sites in next following years of the project (2019)	Conduct a workshop to report the result of the project activities, monitoring and evaluation and discusses on the ways forwards of the lessons learned.	12,250

List of Actual Sub-activity
1. Initiative workshop with key persons for the pilot projects and learning sites and visit to the selected project sites
2. Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites
3. Training /workshop on Base-line survey on fisher's income and relevance data/information collection (in collaboration with Socio-economic section)
4. Training/workshop on development of the improvement of income 's fishers work plan
5. Training course or study visit to Thailand or Japan 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
6. Follow up on the working progress of the project at the pilot-learning
7. Workshop on the activities result and reporting on the lesson learned which will be used for others pilot-learning sites in next following years of the project.

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1: (Country 2 as the extension site) Initiative workshop with key persons for the project in the propose country and visit to the selected project site	<ul style="list-style-type: none"> <li>- agreement of this project from DG and key officers of country</li> <li>- names of persons or sectors to involve as key stakeholders and fisheries profile information of the selection pilot-learning site</li> <li>- community map of the selected pilot-learning site</li> </ul>
Activity 2: Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites	<ul style="list-style-type: none"> <li>- key stakeholder's engagement</li> <li>- real and specific issues which lead to low income of the fishers</li> </ul>
Activity 3: Training –workshop on Base-line survey on fisher's income and relevance data/information collection (in collaboration with Socio-economic section)	<ul style="list-style-type: none"> <li>- strengthen the knowledge and skills of the key officers and stakeholders on data/information gathering and base line survey</li> <li>- checklist of data/information needs –methods to be applied</li> <li>- a set of indicators check list for pilot-learning site monitoring and evaluation</li> </ul>
Activity 4: Training/workshop on development of the improvement of income's fishers work plan	<ul style="list-style-type: none"> <li>- plan of the improvement income of fishers through the value adding in fish catch which are from responsible captures and cultures</li> </ul>

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
Activity 5: 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 or Japan and observation on value adding in fish products	- strengthen knowledge, 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 6: Follow up on the working progress of the project at the pilot-learning	- pre- result of the pilot project-learning site's monitoring and evaluation
Activity 7: Workshop on the activities result and reporting on the lesson learned which will be used for others pilot-learning sites in next following years of the project	- a set of pilot project's monitoring and evaluation result - a set of lesson learned - a set of way forwards

### 3. Schedule of Activity for the Year 2018

<b>Proposed Activity</b>	<b>2017</b>			<b>2018</b>											
	<b>Oct</b>	<b>Nov</b>	<b>Dec</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: Initiative workshop with key persons for the project in Myanmar and visit to the selected project site															
Activity 2: Workshop on key stakeholder's engagement and investigate the real and current situation which lead to the low income of the fishers of the project sites															
Activity 3: Training/ workshop on Base-line survey on fisher's income and relevance data/information collection (in collaboration with Socio-economic section)															
Activity 4: Training/ workshop on development of the improvement of															

Proposed Activity	2017			2018												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
income 's fishers work plan																
Activity 5: 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 or Japan and observation on value adding in fish																
Activity 6: Follow up on the working progress of the project at the pilot-learning																
Activity 7: Workshop on the activities result and reporting on the lesson learned which will be used for others pilot-learning sites in next following years of the project																

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

		Project id: 201301002	
<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>Program Thrust:</b>	I	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 336,003
<b>Project Partner:</b>		<b>Budget for 2018:</b>	USD 105,003
<b>Project Leader:</b>	Fisheries Engineering Section of TD/CFTD (Mr. 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

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

Resolution:

#12 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

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

# 15 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:

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

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

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

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

<b>Objective</b>	<b>Outcomes</b>	<b>Outputs</b>	<b>Activities</b>
<p><b>Objective 1:</b> To transfer appropriate knowledge and enhance awareness on optimizing energy use in fishing and safety at sea for fishing vessels in the Member Countries</p>	<p><b>Outcome 1:</b> Enhancement of knowledge and experience of ship owners, fisheries extension officer, and other key stakeholders of ASEAN Member States</p>	<p><b>Output 1:</b> Report of the training organized in the ASEAN Member States and  Network for optimizing energy and safety at sea for the fishing vessel was establishments.</p>	<p><b>Activity 1:</b> Regional and national training on optimizing energy use and safety at sea for fishing vessels  <b>Activity 1.1</b> Training workshop, project reviews, follows up meeting on the optimizing energy and safety at sea for fishing vessels in Southeast Asian countries.  <b>Activity 1.2</b> On-site training on energy optimization use and safety for small fishing in Southeast Asian countries.</p>
<p><b>Objective 2:</b> Research and development on improvement for good fishing operation and practices with optimizing energy used included working condition and safety at sea.</p>	<p><b>Outcome 2:</b> Appropriate ways and technique on improve sustainable fishing vessel design, fishing gear and Fishery machinery for trawl and purse seine fishery</p>	<p><b>Output 2:</b> 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.</p>	<p><b>Activity 2:</b> Research and development on the implement of fishing operation with optimizing energy use</p>
	<p><b>Outcome 3:</b> Improve fishing vessel CPUE base on energy optimization, best practices, safety at sea, living conditions and improve the standard of occupation for the alternative way of new generations to engage in the capture fishery</p>	<p><b>Output 2.1</b> Report on the progress of Appropriate fishing vessel design for Trawl and Seine fisheries in Southeast Asian Region (Thailand)</p>	<p><b>Activities 2.1</b> Preliminary surveys and meeting-workshop at national level for improving optimizing energy used in the appropriate fishing vessel design for Trawl and Seine fisheries in Thailand and Southeast Asian Region</p>

<b>Objective</b>	<b>Outcomes</b>	<b>Outputs</b>	<b>Activities</b>
<b>Objective 3:</b> Disseminate the technical information activities, output and progress reference for optimizing energy and safety at sea for fishing vessels to the member countries.	<b>Outcome 4:</b> 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	<b>Output 3:</b> Dissemination of the international guidelines for optimizing energy and safety at sea to the key stakeholders. (Technical guideline/manual on energy optimization and safety in English and Bazaar had disseminated)	<b>Activity 3:</b> Information dissemination

### 3.2 Overall Scope/Description of Project

<b>Activity</b>	<b>Description</b>
Activity 1: Regional training/workshop on optimizing energy used and safety for small fishing vessel	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 Member Countries.
Sub-Activity 1.1: Training workshop on the optimizing energy and safety at sea for small fishing vessels	Activities will provide the knowledge and skill to fisheries officials and other key stakeholders for the existing methods and techniques in energy saving use, safety at sea in fishing activities. In addition awareness building on energy saving and safety at sea, as well as improvement of working condition onboard fishing vessels will be strengthened. SEAFDEC will support the establishment of the network of stakeholders in coastal provinces for sharing technical information about energy saving and safety at sea. Threats, issues, and way forward for the promotion of energy saving and safety at sea in capture fishery of 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.  In order to share and exchange the information and technology on energy saving and safety at sea, network of stakeholders in coastal provinces both countries 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 in order to improve fishing vessel Capture per unit effort (CPUE) base on energy efficient (energy saving) in fishing activities through the efficiency improvement of the fishing vessel, fishing gears and equipment relate to fishing operation.
Activity 2.1: Preliminary surveys and meeting-workshop at the national level for gathering the information on improving an optimizing energy used in the appropriate fishing vessel design for Trawl and Purse Seine fisheries in Thailand.	The project has conducted the preliminary surveys for data collection and organized the meeting for gathering the information on appropriate fishing vessel design, in collaboration with relevant agencies, fishers, fishery association and others key stakeholder on optimizing energy use and safety at sea for gathering the information and concept of the new fishing vessel for the future.
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 2013-2018

(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				23,000	
Activity 2:	Sub-activity 2.1:					3,000	78,000	
Activity 3	Sub-activity 3.1:	5,000	5,000	5,000	4,825	4,000	4,003	4,000
	<b>Sub-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>32,000</b>

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

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

- The on-site training on optimizing energy use and safety at sea will conduct at Terengganu, Malaysia during 3-5 October 2017.
- Activities 2.1: Preliminary field surveys and meeting-workshop at the national level. Come out with the report on the progress of appropriate fishing vessel design for Trawl and Seine fisheries in Thailand.

### 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:					
Sub-activity 1.2: Onsite training for TOT on optimization energy use and safety at sea will conduct in Terengganu, Malaysia 3-5 Oct 2017	Training			Malaysia	25,000
Activity 2:					
Sub-activity 2.1:	R&D on appropriate fishing gear design			Thailand	3,000
Activity 3:	Information dissemination			Malaysia	4,000

### 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>Participants are able to transfer and utilize the knowledge and information on energy saving and safety at sea</li> <li>Threats, issues, and way forward for the promotion of optimizing energy use and safety at sea</li> <li>Network of stakeholders in coastal provinces</li> </ol>	<p>On-site training on optimizing energy use and safety had conducted in Terengganu, Malaysia, 3-5 October 2017</p> <p>The network of stakeholders in coastal provinces of SEAFDEC Member Countries both countries level and regional has been strengthened. The advanced technology on optimizing energy and safety at sea for small fishing vessels are able to distribute through the network.</p>

<b>Planned activity</b>	<b>Expected outcome/output</b>	<b>Achievements</b>
Activity 2.		
Sub-activity 2.1 R&D on appropriate fishing vessel and fishing gear design	The concept appropriate fishing gear design for trawl fishery aims to improve fishing vessel efficiency for CPUE base on improvement of working condition, energy saving and safety at sea in fishing activities	1. New design of otter board for trawl fishery with appropriate for Thai fishing vessel. 2. The concept of appropriated fishing vessel design.
Activity 3. Information dissemination	Sets of training materials were disseminated to target participants of the training. They duty are fisheries extension work for the coastal in their countries included fisheries officials from local and central level, fishing vessel owners, fisheries and other key stakeholders.	Technical handbooks on the energy saving measure and Safety recommendations for fishing vessel in local language (Bazaar) had provided and will disseminate at the training program

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

<b>List of completed publications for the year 2017</b>	<b>Type of media</b>	<b>Attached e-file</b>
1. Energy saving measure and rational energy consumption in fishing industry	Hand book	
2. Safety recommendations for decked fishing vessels of less than 12 meters in length and undecked fishing vessel	Hand book	

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

<b>Planned activity</b>	<b>Evaluation/ Views from Participants</b>
Activity 1	
Sub-activity 1.2	Useful information from the training program. Will be the prototype to do energy efficient measures related to the measurement of fuel consumption, fishing vessels, and national actions for effective collection and use of fuel at pilot sites or fishing fleets.
Activity 3	
Sub-activity 3.1	satisfied
Sub-activity 3.2	satisfied

#### 6. Major Impacts/Issues

The major concerns on human well-being in fisheries are poverty and safety at sea. In the capturing process, the fuel cost obviously takes up majority of operational cost and directly decrease income of fisherman. The use of energy includes over-power of engine, low engine maintenance, inappropriate fishing boat design and fishing operations/practices possibly major impact to the fisher revenue.

Human well-being issues of fishers are also degraded by the safety of fisher at sea. Less of budget, concern and appropriated regulation or monitoring process by responsible agencies is significant hindrance to strengthen safety at sea for fishers in Southeast Asian Region. In order to address the issues of energy saving and safety at sea in Southeast Asia Region, Resolutions and Plan of Action adopted by the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 on June 2011, at Bangkok, Thailand, has provided the guidance for SEAFDEC's projects and activities.

With this regards, it is essential to promote appropriate energy utilization in order to reduce fuel consumption, lower carbon emission to the environment by minimizing the contribution of the fisheries sector to greenhouse gas emission, with emphasis on promoting energy efficiency. In addition, the working conditions of fishers' onboard fishing vessels are considered poor and needed improving. It is, therefore necessary to strengthen measures for the safety of fishing vessels by taking into account regional/national specificity.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
Sub-activity 1.1: Training workshop on the optimizing energy and safety at sea for fishing vessels	<p>SEAFDEC/TD will organize and facilitate the 3-days Training workshop for the project review and follow activities at the regional level on energy saving and safety at sea for fishing vessels will conduct in Bangkok. The participants will obtain the information and applicable knowledge on energy saving technology and safety at sea.</p> <p>Due to the fact that it is necessary to understand the current situation and technology concerning on reduction of fuel consumption and improve safety at sea in their respective country/area, the national and local initiatives related to energy saving and safety at sea will be presented, and discussion on the major issues related to energy saving and safety at sea will be made during the program. In addition, special lecture and onboard demonstration on the use of equipment to measure the fuel consumption of fishing vessels will be carried out during the training program. Threats, issues, and way forward for the promotion of energy saving and safety at sea in capture fishery of Southeast Asia will be identified and discuss. And,</p> <p>The establishment of the network for optimizing energy and safety at sea for small-scale fishing in SEA will be developed during the training course.</p>	23,000
Sub-activity 1.2	There are not any proposed activities in year 2018	
Activity 2: Sub-activity 2.1 Gathering and Meeting for the information.	<p>SEAFDEC/ TD will facilitate/cooperated with the fishers, fishery association or relevance organization/institute for gathering technical information included research and develops on appropriate fishing vessels design, fishing gear, and machinery target for trawl and seine vessels.</p> <p>These aims to improve good fishing practices, good living condition, energy saving and safety at sea include enhancing of fishers awareness and the technical information.</p>	78,000
Activity 3:	<p>Information dissemination, <i>e.g.</i> Compilation of report on-site training on energy saving and safety of fishing vessel Handbook on optimizing energy and energy audits for fishing vessels</p>	4,003

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
Sub-activity 1.1	<p>Regional and national training on optimizing energy and safety at sea for fishing vessels. Activities will provide the knowledge and skill to fisheries officials and other key stakeholders for the existing methods and techniques in energy saving use, safety at sea in fishing activities. In addition awareness building on energy saving and safety at sea, as well as improvement of working condition onboard fishing vessels will be strengthened. SEAFDEC will support the establishment of the network of stakeholders in coastal provinces for sharing technical information about energy saving and safety at sea. Threats, issues, and way forward for the promotion 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>
Sub-activity 1.2	There are not any proposed activities in year 2018
Activity 2:	<p>R&amp;D on the implementation of initiative, energy saving technology will be applied/adapt to a fishing vessel and fishing activities aim to:</p> <p>Improve fishing vessel to the environmental friendly manner through optimizing energy. The research aims to use/reducing of fuel consumption and carbon emission of the investigate vessel by 15-20%. Useful technical information on fuel efficiency will promote and disseminated to fishing fleet in Southeast Asian Countries. Improve fisher's income and fisheries resources.</p>
Sub-activity 2.1:	Gathering the information for the concept of the improvement of appropriate fishing vessel design, fishing gears, and fishery machinery has implements/introduce/improve for purse seine vessel.
Activity 3	<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 Use and Safety at Sea for Small Fishing Vessel.</p> <p>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</p>
Sub-activity 3.1	Compilation of report on-site training on energy saving and safety of fishing vessel
Sub-activity 3.2	Handbook on optimizing energy and energy audits for fishing vessels

## 3. Schedule of Activity for the Year 2018

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												
Sub-activity 2.1												
Activity 3												
Sub-activity 3.1												
Sub-activity 3.2 (if any)												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			Project id: 201301003
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC ASSP/FCG Mechanism		
<b>Project Title:</b>	Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	2015 - 2019
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 345,328
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD 129,068
<b>Project Leader:</b>	Mr. Isara Chanrachkij	<b>Involved Country:</b>	SEAFDEC Member Counties

## 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 States 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
<b>Objective 1:</b> Information gathering on fisheries resources enhancement and habitat conservation measures in Southeast Asia	<b>Outcome 1:</b> Application and verification of various methodologies for quantitative assessment, monitoring and evaluation of the effectiveness of resources enhancement initiatives.	<b>Output 1:</b> Mapping of important critical fishing grounds and habitats and associated fish species.	<b>Activity 1:</b> 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
<b>Objective 2:</b> Human resources development for implementation of fisheries resources enhancement and habitat conservation measures	<b>Outcome 2:</b> Strengthen and developed of human capacity in fisheries resources enhancement and habitat conservation	<b>Output 2:</b> 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.	<b>Activity 2:</b> 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.
<b>Objective 3:</b> Disseminating and promoting fisheries resources enhancement and habitat conservation measures suitable for Southeast Asia	<b>Outcome 3:</b> Rising awareness of resources users on the important of fisheries resources enhancement and habitat conservation	<b>Output 3:</b> Publication of the promotion materials on importance of fisheries resources enhancement and habitat conservation	<b>Activity 3:</b> Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region

#### 3.2 Overall Scope/Description of Project

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

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

**3.3 Activity, Sub-activity and Proposed Budget for 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	360	30,000	0
	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	2,500
	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	0	10,243	4,360
	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	27,860
	Sub-activity 2.3 Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures	0	0	0	30,000	30000
Activity 3	Sub-activity 3.1	1,000	560	1,000	1,094	2,000
	Sub-activity 3.2	0	0	0	0	15,280
	<b>Sub-Total Budget</b>	<b>53,700</b>	<b>48,560</b>	<b>32,000</b>	<b>129,068</b>	<b>82,000</b>

**PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION****1. Achievements of the Project Implementation for the Present Year**

Three main activities includes 1) Survey on Fish Enhancing Devices (FED), 2) Member Countries visit to diagnoses and evaluation Critical Habitats/Fishing Grounds in Southeast Asia, and 3) Regional Workshop on Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia, that had undertaken in 2017. Series of the 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 will summarize the updating on the activities of resources enhancement activities in Southeast Asia and seek 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	3		10,000 (Expected)
Sub-activity 1.3: Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation					Postpone to 2018
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					
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					

## 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 and associated fish species.	
Sub-activity 1.2: Information collection on suitable designs of resource enhancement practices including their evaluation and promotion		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

<b>Planned activity</b>	<b>Expected outcome/output</b>	<b>Achievements</b>
Sub-activity 1.3: Workshop/ Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation		Report on the Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation Includes the way forward
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	
Sub-activity 2.2: Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management	measures as well as technical transferring through the technical assistance in a pilot site implementation.	
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 of 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

<b>List of completed publications for the year 2017</b>	<b>Type of media</b>	<b>Attached e-file</b>
1. (Draft) Survey reports on the designs, material, construction and recommendation on the good practices and management of FEDs installation in Thailand	publication	
2. (Draft) Technical Meeting on suitable measures for sustainable fisheries resource enhancement and habitat conservation	publication	

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

<b>Planned activity</b>	<b>Evaluation/ Views from Participants</b>
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

Planned activity	Evaluation/ Views from Participants
	information, <i>e.g.</i> indigenous knowledge of fishers, scientific researches, etc.
Activity 2:	Monitoring and evaluation of successes and failures of resources enhancement initiatives should be carried out based on intended objectives, <i>e.g.</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

Regarding the restructure of Training Department of SEAFDEC effective in April 2017, Research and Development Division, the delay on implementation of JTF Project on “Promotion of sustainable fisheries resources enhancement measures in critical habitats/fishing grounds in Southeast Asia” and the work plan in the year 2017 has been revised. Three main activities includes 1) Survey on Fish Enhancing Devices (FED), 2) Member Countries visit to diagnoses and evaluation Critical Habitats/Fishing Grounds in Southeast Asia, and 3) Regional Workshop on Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia, that had undertaken in 2017.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2018

### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(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  1.1.1 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 Dog Conch in Krabi and Satun province, Thailand. (10,000)  1.1.2 Research study on the environmental impact assessment on installation of Artificial reef or FEDs in Trat Province, Thailand (in collaboration with local university). (20,000)	30,000
	Sub-Activity 1.2 Information collections on suitable designs of resource enhancement practices including their evaluation and promotion  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 collections would be conducted through deskwork and designs/models experiment.	5,542

Proposed Activity	Description of Proposed Activity	Proposed Budget
	The technical discussion between fishing technology of SEAFDEC, BFAR of Philippines or Balai Besar Penangkapan Ikan (BBPI) Semarang, Indonesia of will be conducted with the objective on collecting FEDs construction and design in Philippines and Indonesia. Identification on the target species of FEDs design, Mapping of important fishing grounds and habitats on FEDs installation in the Gulf of Thailand and Andaman Sea.	
	<p>Sub-Activity 1.3 Two (2) Workshops/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation</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.</p>	35,000
Activity 2. Technical assistance led by pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds	<p>Sub-Activity 2.1 Technical assistance in a pilot site for suitable designs of resource enhancement practices</p> <p>In this activity, selected on-site study and evaluation on enhancement practices including Fish Enhancing Devices (FEDs) impact to fisheries resources and environment are in Binh Thuận Province of Viet Nam.</p>	10, 243
	<p>Sub-Activity 2.2 Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management</p> <p>In order to develop strategies and actions in rehabilitating the critical fishing grounds as practical management measures, 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 inland water reservoir in Nam Haum, Lao PDR.</p>	15,000
	<p>Sub-Activity 2.3 Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures</p> <p>Study on Enhancement of Sustainable Management of the Blue Swimming Crab Fisheries in Kep</p>	30,000
Activity 3. Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region	<p>Sub-Activity 3.1 Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness</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>	1,094
	<b>Total</b>	<b>129,068</b>

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
Activity 1. Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices	Knowledge and experience to rehabilitate the critical fishing grounds and technology to construct devices of enhance the resources will be disseminate to the Member Countries through Workshop/Technical Meeting
Sub-activity 1.1 Investigation/review of the status of critical fishing grounds in the Southeast Asian region	Knowledge and experience to rehabilitate the critical fishing grounds of seagrass beds for Dog Conch in include the lessen learn on the follow up activities in Kribi Province and expansion of Satun Province will be disseminate to the Member Countries through Workshop/Technical Meeting.  Research study report and guideline to environmental and socioeconomic impact assessment on installation of Artificial reef or FEDs
Sub-activity 1.2 Information collections on suitable designs of resource enhancement practices including their evaluation and promotion	Survey reports on the designs, material and construction in Philippines or Indonesia includes the recommendation on the good practices and management of FEDs and mapping of important fishing grounds and habitats on FEDs installation in Philippines or Indonesia
Sub-activity 1.3 Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation	Report on the Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation Includes the way forward
Activity 2. Technical assistance led by pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds	In order to develop strategies and actions in rehabilitating the critical fishing grounds as practical management measures, critical fishing grounds will be selected for diagnosing fishing grounds and monitoring the achievements of rehabilitation program in selected pilot sites for fisheries resources in member countries.  Capacity building on theory and methodology of fisheries resources and habitats/fishing grounds would be provided through a training course 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 Technical assistance in a pilot site for suitable designs of resource enhancement practices	Local fishers in Binh Thuận Province, Viet Nam can construct and install FEDs in their fishing ground. Training reports on the National Workshop on Introduction of Fish Enhancing Devices include the design of local Fish Enhancing Devices for small-scale fisheries in Binh Thuận Province, Viet Nam and national policy and framework on the promotion Fish Enhancing Devices for small-scale fisheries of Viet Nam.
Sub-activity 2.2 Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management	Local fishers in Nam Haum, Lao PDR can improve their fishing ground. Reports on the identification and evaluation of fisheries ecosystem in the inland water reservoir in Nam Haum, Lao PDR will be disseminated.
Sub-activity 2.3 Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures	Local fishers in Kep FiAC and CFi to improve the fishery management capacity to manage crab fisheries.
Activity 3. Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region	Documentation of the best practices of the project implementation will be carried out.

Proposed Activity	Expected Outcomes/Outputs of Activity
Sub-activity 3.1 Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness	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 2018

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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												
Sub-activity 1.2 Information collections 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												
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												
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												

<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 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												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			Project id: 201503002
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC ASSP/FCG Mechanism		
<b>Project Title:</b>	Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	2015 - 2019
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 356,200
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD142,480
<b>Project Leader:</b>	Chihaya Nakayasu	<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.
- 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
<b>Objective 1:</b> To establish environment-friendly, responsible aquaculture technology	<b>Outcome 1:</b> Use of plant-origin feed ingredients that are available in the region for cultured freshwater fish species such as tilapia.  Promoting the aquasilviculture of shrimp as an ecosystem based management strategy	<b>Output 1:</b> Exploration of plant-origin feed ingredients that are available in the region for cultured freshwater fish species such as tilapia.  Establishment of ecosystem-based pond management strategies for increased production in ASEAN Member States.	<b>Activity 1: Establishment of environment-friendly, responsible aquaculture technology</b> <ul style="list-style-type: none"> <li>- The replacement of <b>fishmeal</b> as the main source of protein in feeds that will further improve production traits of tilapia.</li> <li>- Test of refined formulated diets in cages and pond culture systems using improved feeding management scheme</li> <li>- 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.).</li> </ul>

<b>Objective</b>	<b>Outcome</b>	<b>Output</b>	<b>Activity</b>
<p><b>Objective 2:</b> 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.</p>	<p><b>Outcome 2:</b> Promotion for the community-based production and resource enhancement of high-value aquatic resources</p>	<p><b>Output 2:</b> Improvement of organizational, management and entrepreneurial skills of fisherfolks to sustain livelihoods from production, sea ranching and stock enhancement high-value aquatic products.</p> <p>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</p>	<p><b>Activity 2: Promote community-based production and resource enhancement of high-value aquatic resources</b></p> <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.</li> </ul>
<p><b>Objective 3:</b> To extend and demonstrate aquaculture technologies to Member Countries.</p>	<p><b>Outcome 2:</b> Extending the technologies to rural member countries to hasten economic development in the region.</p>	<p><b>Output 3:</b> Extension of technologies to rural member countries to hasten economic development in the region.</p>	<p><b>Activity 3: Technology and information transfer on resource enhancement practice through training.</b></p> <ul style="list-style-type: none"> <li>- Extension and demonstration for the breeding, hatchery seed production, nutrition and health management in grouper, seabass, snapper <i>etc.</i> 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

<b>Activity</b>	<b>Description</b>
<p>Activity 1: Establishment of environment-friendly, responsible aquaculture technology</p>	<p>Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits</p> <p>Use of plant-origin feed ingredients that are available in the region will be explored in the development and/or refinement of aquafeed for cultured freshwater fish species such as tilapia. Activities are geared toward the replacement of fishmeal as the main source of protein in feeds that will further improve production traits of tilapia.</p> <p>Sub-activity 1.2_ Responsible aquaculture through aquasilviculture</p> <p>Aquasilviculture as an ecosystem-based pond management strategy will be investigated. Micro-organisms present in the mangrove forest has the ability to transform nutrients to bioavailable form that can be eaten by microorganisms lower in the food web which in turn can serve as food to organisms higher in the food web like the crabs. This process of transformation also improves water quality. The ability of mangroves to improve water quality is affected by the mangrove to pond area ratio</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>Sub-activity 2.1 Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement</p> <p>Sea cucumber or sandfish are detritus feeders in intertidal flats and reef areas that help aerate marine sediments and recycle nutrients necessary for maintaining marine ecosystems. Donkey ear abalones are gastropods that feed on encrusting algae and micro-particulates in coralline areas. Households in coastal and island communities earn income from selling these high-value export commodities. These species have become overexploited. Community-based integrated production of these species through culture, sea ranching and stock enhancement is proposed for low-income households who live in environments without electricity but with natural food for abalones and sea cucumbers. Thus, seeds will be produced in small-scale solar-powered hatchery. This project aims to maintain the health of the intertidal and reef environment through production systems that use hatchery-bred seeds produced from local broodstocks and grown with natural food while providing sustainable sources of income for coastal dwellers in remote island communities and improve governance of coastal resources in the Philippines and similar areas in Member Countries in Southeast Asia.</p> <p>Sub-activity 2.2 Promotion of resource enhancement of seahorses</p> <p>Seahorses, which are highly exploited for their high price, were among the first marine fishes of commercial importance to be listed in the International Union for Conservation of Nature (IUCN) and all seahorses (genus <i>Hippocampus</i>) are listed the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) Appendix II effective May 15, 2004. Seed production technology in seahorses is expected to provide the needed seed for the resource enhancement in the potential release sites. In addition, the baseline assessment of the seahorse natural stocks in the potential release site was conducted in JTF5. The 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</p>
Activity 3: Technology extension and demonstration	<p>Sub-activity 3.1 Marine fish hatchery training program</p> <p>Aquaculture of high-value marine finfish species continues to develop rapidly in Southeast Asia. This training program will extend and demonstrate the breeding, hatchery seed production, nutrition and health management in grouper, seabass, snapper <i>etc.</i></p> <p>Sub-activity 3.2 Rural aquaculture program</p> <p>Training focusing on promotion of community-based freshwater aquaculture for remote rural areas of Southeast Asia will be organized by SEAFDEC/AQD under this sub-activity, which will promote capacity building for establishing appropriate aquaculture system applicable in remote rural area.</p>
Activity 4: Publication	Manuals, posters, pamphlets and flyers describing disease prevention methods will be published and distributed.

Activity	Description
Activity 5: Annual progress meeting and international workshop	<p>Sub-activity 7.1 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> <p>Sub-activity 7.2 International workshop</p> <p>The workshop, not only receive participants from member countries, but also invite expert scientists as key note speakers to facilitate to spread and exchange brand-new information on fish health management between SEAFDEC and various institutions.</p>
Activity 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 2013-2017

(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	29,000
	Sub-activity 2.2: Promotion of resource enhancement of seahorses	11,000	8,800	8,800	11,380	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	5,000
Activity 5: Annual progress meeting and international workshop	Sub-activity 5 Annual progress meeting	5,000	4,000	4,000	4,000	4,000

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
	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>84,400</b>

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

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

Activity 1-1) Evaluation on the potential use of selected agricultural wastes and by-products as supplemental ingredients in tilapia diets, Activity 1-2) The time required to remove ammonia and phosphate from shrimp pond effluent were determined, 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 will be done 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					
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		3	7,500
Sub-activity 3.2 Rural aquaculture program	II: Training to be (conducted Nov. 21-30, 2017)	Not applicable at the moment.		Not applicable at the moment.	8,500

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

Planned activity	Expected outcome/output	Achievements
Activity 1. Establishment of environment-friendly, responsible aquaculture technology		
Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits	To produce tilapia with improved production traits using agricultural wastes and by-products as feed ingredients	A survey of major crop industries revealed high amount of wastes were generated after processing. The proximate composition of agricultural by-products (ABPs) had shown either as protein or carbohydrate sources in feed formulation. Pesticide residue levels were below the limit of quantification or lower than the maximum residue limits adopted by FAO Codex Alimentarius. However, ABPs were associated with high levels of lignin, phenols and low to moderate levels of tannin. Growth performance of fish fed diets with untreated citrus pulp, okara meal and pineapple peel did not differ from those fed the control diet. Enrichment studies by ensiling or solid state fermentation have been shown to improve their crude protein levels with nutrient addition.
Sub-activity 1.2 Responsible aquaculture through aquasilviculture	To determine the time required for a mangrove habitat to remove nutrients ( <i>i.e.</i> N, P) from shrimp farm effluents.	Pond effluents from shrimp culture (DOC 75) were drained into habitats with and without mangroves. Nutrients level were measured regularly. Ammonia, phosphate, chlorophyll <i>a</i> and total suspended solids were fluctuating but generally lower in water drained into habitat with mangroves compared to those without mangrove. Ammonia was not detected in habitat with mangrove 3 days after draining; phosphate after 5 days. Ammonia and phosphate of water drained into environment without mangrove remained high 14 days after draining.
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	Improving fisheries governance and strategies for managing enhanced abalone and sandfish stocks and health of its habitat.	The accomplishments of the project in 2017 include: 1) participated in Sustainable Seafood Week through lectures and exhibits of the Community-Based Resource Enhancement (CBRE) in January & February; 2) released 600 hatchery-reared abalone juveniles in CBRE release site in replicate site in Molocaboc Diut on 22 June to address increasing demand from buyers since fisherfolks gained market access as live abalones were supplied to hotels and other buyers in Manila aside from local buyers in the Visayas; 3) nursed a cumulative total of 84,000 sandfish early juveniles and those released in sea ranch site are of marketable size >300g; 4) obtained access to land in Molocaboc Dacu in 21 June for the solar-powered abalone hatchery as the land owner in Molocaboc Dacu agreed to sell 1,000 m <sup>2</sup> portion of land to the local government of Sagay City for this purpose; and 5) conducted an exploratory visit for CBRE in Camarines Sur on 30 May.
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	Due to uncertain availability of juvenile seahorses from the hatchery, there is a need to conduct trials on the establishment of nursery rearing condition of seahorses in Molocaboc Island using available food from the sampling site. Fishermen organization members will be trained on the nursery rearing of newborn seahorses using the available live feed collected from the sampling site in Molocaboc Island. Information

Planned activity	Expected outcome/output	Achievements
	community in the management of the natural resources.	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.
Activity 3 Technology extension and demonstration		
Sub-activity 3.1 Marine fish hatchery training program	To train participants to operate a fish hatchery by providing them with technical knowledge and skills on spawning and larval rearing of marine fishes.	The International Training Course on Marine Fish Hatchery was conducted at Tigbauan Main Station from June 20 – July 26, 2017.  There were seven (7) participants. The two (2) participants (1 from Myanmar and 1 from Viet Nam) awarded GOJ-TF Training Fellowship Grants, submitted narrative reports.
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 21- 30, 2017 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. Only Myanmar has sent 1 nominee to date.  Preparations for the training are currently being done.

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

List of completed publications for the year 2016	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 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	Positive high rating during the 2016 Annual Project Review and Evaluation held February 2017. The CBRE project site was visited and appreciated by trainees and students under TID training activities.
Sub-activity 2.2 Promotion of resource enhancement of seahorses	

Planned activity	Evaluation/ Views from Participants
Activity 3 Technology extension and demonstration	
Sub-activity 3.1 Marine fish hatchery training program	Participants evaluated relevance of topics (4.67); technical knowledge learned (4.83); trainees confidence to do duties upon return (4.67); overall coordination of training activities (4.83), 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. 21-30, 2017.

## 6. Major Impacts/Issues

Activity 2.1 New challenges arise as sandfish released in ranching site (more than 300 g size) and ready for market were observed to have mollusk infestation and will be studied. Genetic connectivity sub-study should be conducted to validate that untagged abalones are off-springs of the hatchery-reared juveniles released periodically in 2011 up to 2015.

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 2018

### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(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	Study on the use of bacterial inoculation to reduce the duration of treatment or fermentation of agricultural wastes and by-products will be explored. Feeding trials of tilapia juveniles to determine the optimal inclusion level of selected agricultural wastes and by-products and their combination in tilapia feeds and their effects on growth and feed performance, hematological parameters, gut morphology and disease resistance will be conducted.	18,800
Sub-activity 1.2 Responsible aquaculture through aquasilviculture	The experiment done in 2017 will be replicated. Briefly, <i>P.monodon</i> will be cultured in an earthen pond; effluent from the culture pond will be drained into areas with and without mangroves. The time required for a mangrove habitat to remove nutrients ( <i>i.e.</i> N, P) from shrimp farm effluents will be determined.	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	The study will continue to replicate the community-based abalone and sandfish production in suitable areas in other municipalities, in collaboration with relevant LGU and recipient fisherfolk organizations. In Molocaboc Dacu and Diut, the project will continue implementing project exit strategies in 2018, including training fisherfolks towards operationalization of a productive and sustainable abalone hatchery. Examine and determine larval dispersal pattern and causes of mollusk infestation in sandfish flesh to determine remedies. The project will also conduct impact assessment survey with fisherfolks and other stakeholders in mid-2018.	29,000
Sub-activity 2.2 Promotion of resource enhancement of seahorses	To promote resource enhancement of seahorses. Specific objectives: to establish nursery rearing of seahorse in Molocaboc Island; to determine the appropriate time of	11,380

Proposed Activity	Description of Proposed Activity	Proposed Budget
	release; to determine growth and survival of the released seahorses; and to intensify the involvement of the community in the management of the natural resources.	
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	21,000
Sub-activity 3.2 Rural aquaculture program	An important component to help alleviate poverty especially in rural areas is the conduct of community-based freshwater aquaculture . This 10-days training program focuses on seed production of freshwater species such as tilapia, bighead carp, catfish and freshwater prawn with the idea of enhancing fisherfolks capacity to establish freshwater aquaculture system applicable in remote rural areas of Southeast Asia.	10,500
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.	4,000
Sub-activity 5.2 International workshop		35,000
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 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
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 effect of bacterial treatment on nutritional composition of selected agricultural waste and by-products known. Optimal inclusion of treated agricultural wastes and by-products and their effects on growth and feed performance, hematological parameters, gut morphology, disease resistance and sensory properties of tilapia juveniles determined.
Sub-activity 1.2 Responsible aquaculture through aquasilviculture	Data from replicate 2 on the time required for a mangrove habitat to remove nutrients ( <i>i.e.</i> N, P) from shrimp farm effluents.
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	Operational hatchery with fisherfolks trained in breeding and nursery of abalone. Other new stock enhancement replicate sites established with other collaborators. Socioeconomic impact and benefits from CBRE assessed. Larval dispersal and mollusk infestation in sandfish determined and resolved.

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
Sub-activity 2.2 Promotion of resource enhancement of seahorses	Appropriate time of release determined; growth and survival of the released seahorses determined; and active and participatory involvement of the community in the management of the natural resources promoted
<b>Activity 3. Technology extension and demonstration</b>	
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 2018

<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. 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												

<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>
Sub-activity 3.1 Marine fish hatchery training program												
Sub-activity 3.2 Rural aquaculture program												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			Project id: 201505001
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC ASSP/FCG Mechanism		
<b>Project Title:</b>	Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	IFRDMD	<b>Lead Country:</b>	Indonesia
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 190,000
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD 80,940
<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 aimed at enhancing 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 have just quite limited knowledge on tropical eel species in this region yet.

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

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

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

Objectives	Outcomes	Outputs	Activities
<p><b>Objective 1:</b> Having clear understanding on present status of resources, fisheries and utilization of catadromous eels in the region</p>	<p><b>Outcome 1:</b> Understanding the present status on catadromous eel resources in the region. It would be a valuable source for consideration of the conservation measures on tropical eel in the latter half of this project.</p>	<p><b>Output 1:</b> Grasping the present status of fisheries, commercial distribution and the trades of catadromous eel in the region.</p>	<p><b>Activity 1:</b> <b>Clear understanding on current situation of resources, fisheries and utilization</b> Sharing and exchanging information on catadromous eels in the region among AMS through a workshop focusing on its fisheries.</p> <p>Collecting the basic information and data by surveying on eel fisheries for clear understanding on present status and intensity of eel fisheries including glass eel fishery.</p> <p>Finding out the present status of eel trade and market in AMS through interviewing the stakeholders on commercial distribution and trade on tropical eels.</p>
<p><b>Objective 2:</b> Improving data collection and statistics of catadromous eel catch in AMS</p>	<p><b>Outcome 2:</b> Improving the method of data collection on eel fisheries in the region, with mutual understanding of the differences and similarities on eel fisheries at each AMS.</p>	<p><b>Output 2:</b></p> <ul style="list-style-type: none"> <li>Improving the species identification technique on genus <i>Anguilla</i> in the region.</li> <li>Gathering continuous data on eel fisheries and trades in AMS with accuracy.</li> <li>Finding out the appropriate methods/measures to collect statistics on eel fishery in the region.</li> </ul>	<p><b>Activity 2:</b> <b>Improvement of data collection and statistics on eel fisheries</b> Conducting studies on species identification based on DNA technology, including the training of handling genetic information.</p> <p>Developing the basic methodologies of data collection for catch/trade statistics on eel in AMS.</p> <p>Having a discussion how to develop data collection methodologies for eel statistics among AMS.</p>
<p><b>Objective 3:</b> Enhancing knowledge and capacity of AMS for conservation, management and sustainable utilization of catadromous eel resources</p>	<p><b>Outcome 3:</b> Promoting the appropriate management of eel fisheries for the sustainable use of tropical eel resources in the region.</p>	<p><b>Output 3:</b></p> <ul style="list-style-type: none"> <li>Finding important causes and factors that weak the negative impact on tropical eels then seeking the mitigating measures.</li> <li>Constructing guidelines on eel fishery in the region.</li> </ul>	<p><b>Activity 3:</b> <b>Promotion of conservation, management and sustainable utilization</b> Conducting researches in several waters in the region regarding the negative impact of environmental changes on catadromous eel resources and seeking measures for mitigation from the damages.</p>

Objectives	Outcomes	Outputs	Activities
		<ul style="list-style-type: none"> <li>Disseminating the results from this project and also proposing guidelines/policy recommendation on eel fisheries among AMS.</li> </ul>	<p>Compiling all the results from the activities done under the project into the guidelines on conservation, management and sustainable utilization of catadromous eel resources in the region.</p> <p>Having a workshop for dissemination of the outcomes from this project and developing a policy recommendation on sustainable use of catadromous eel resources in the region. The summarization of the appropriate methods/measures to collect statistics on eel fishery in the region (Activity 2) will also be conducted in this workshop.</p>

### 3.2 Overall Scope/Description of Project

Activity	Description
<p>Activity 1 Clear understanding on current situation of resources, fisheries and utilization</p>	<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 into 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>
<p>Activity 2 Improvement of data collection and statistics on eel fisheries</p>	<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>
<p>Activity 3 Promotion of conservation, management and sustainable utilization</p>	<ul style="list-style-type: none"> <li>Conducting researches 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 from the activities done under the 4-year project into the guidelines on conservation, management and sustainable utilization of catadromous eel resources in the region. It will work on this task in 2018. (Sub-activity 3.2. It was originally planned in 2018 though, it is postponed to 2019 to include all the results from all the activities under this project into the guidelines, with the preparatory process of the wrap-up workshop as sub-activity3.3.)</li> <li>Having a workshop for dissemination of the outcomes from this project and</li> </ul>

Activity	Description
	developing a policy recommendation on sustainable use of catadromous eel resources in the region at the end of the project (2019). (Sub-activity 3.3) The summarization of the appropriate methods/measures to collect statistics on eel fishery in the region (originally planned as Sub-activity 2.3) will also be conducted in this workshop.

### 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 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 <i>(Extended till 2019)</i>	8,000	12,000	8,000	10,000	3,500
	Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels <i>(Extended till 2019)</i>	8,000	9,000	8,000	15,000	3,500
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	
	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 <i>(postponed to 2019)</i>					7,000
	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)					25,000
<b>Sub-Total Budget</b>		<b>42,000</b>	<b>42,000</b>	<b>42,000</b>	<b>80,940</b>	<b>42,000</b>

## PART II: ACHIEVEMENT OF 2017PROJECT IMPLEMENTATION

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

In 2017, IFRDMD conducted questionnaire survey in all SEAFDEC member countries to confirm the present status of eel fishery/farming then summarized and prepared these results for the preparatory meeting on new JAIF project held in Palembang, Indonesia.

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 exploitation in 3 countries in SEAFDEC member countries where eel fisheries and eel farming exist then collected information 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 instead of DNA analyses and the possibilities of its application have been discussed with the scientists in the region.

Since the new JAIF project on eel has been started from Aug. 2017, the main issues on eel fishery/eel farming would be treated under JAIF project till Jun. 2019. To ensure the information security on eel issues in relation with the upcoming CITES Cop18 (2019), all the results and related information on tropical anguillid eels that are collected through the eel studies under JTF project and also JAIF project are managed centrally and comprehensively by SEC then not disclosed without the permission of SEC in advance.

### 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 (9-10 and 15-21 January, 6-9 February, 14-16 May, 13-18 July)*	I: Research	17	7	50	20,000**
Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels (9-10 and 15-21 January, 6-9 February, 14-16 May, 13-18 July) *	I: Research	17	7	50	20,000**
Activity 2. Improvement of data collection and statistics on eel fisheries					
Sub-activity 2.1: Study on catadromous eel species identification by DNA technology (January to December, 2017)*	I: Research	9	8	6	11,751**
Sub-activity 2.2: Study on statistical data collection methodologies (January to December, 2017)*	I: Research	9	8	6	1,750**
Activity 3. Promotion of conservation, management and sustainable utilization					
Sub-activity 3.1: Study on elements negatively impacting catadromous eel resources and mitigating measures (January to December, 2017)*	I: Research	9	8	6	1,750**

\* Only the researches/activities those had been conducted till 25 Aug. are written.

\*\* These figures contain the expected expenses till the end of 2017. Research activity done in Indonesia costs USD 3,500-, done in outside of Indonesia costs USD10,000-, in average. Sub-activities 1.2, 1.3 and part of 2.1, 2.2 and 3.1 were conducted in the same researches simultaneously.

\*\*\* Total of the (expected) spent budget till the end of 2017 will be USD 55,251 and it exceeds the proposed budget for 2017, USD 42,000. The remaining budget carrying over from last year (USD 80,161 in total, incl. budget for “0520150102 Promotion of inland fishery project”) is also used to conduct the activities in 2017 then consumed all the budget in the end of 2017.

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

Planned activity	Expected outcome/output	Achievements
<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	Understanding of the present status and recent trend of eel fisheries and eel resources in the region.	We got information regarding the target species and stage of anguillid eels as seeds for eel culture in certain countries, with technical information.  From the perspective of the information security, detailed contents of the results of the surveys are disclosed later after getting approval of JAIF-Secretariat on eel project.
Sub-activity 1.3 Survey on commercial distribution/trade of catadromous eels	Understanding the amount and route of trading of eel in AMS.	We got information regarding the commodity chains and demand-supply relationships of eel seeds in certain countries.  From the perspective of the information security, detailed contents of the results of the surveys are disclosed later after getting approval of JAIF-Secretariat on eel project.
<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	The establishment of the method of species identification on genus <i>Anguilla</i> by DNA analysis.	We got fundamental information regarding the species composition of anguillid eels in Viet Nam and Philippines.  From the perspective of the information security, detailed contents of the results of the surveys are disclosed later after getting approval of JAIF-Secretariat on eel project.
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.	We have summarized the present situation of collecting catch statistics on anguillid eels at each stage in SEAFEC Member Countries.  From the perspective of the information security, detailed contents of the results of the surveys are disclosed later after getting approval of JAIF-Secretariat on eel project.
<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 researches in several waters in AMS, regarding the negative impact of environmental changes on catadromous eel resources and seeking measures for mitigation from the damages.	We got the preliminary information regarding the relationship between upward migration of eels and the artificial constructions in the rivers in some countries.  From the perspective of the information security, detailed contents of the results of the surveys are disclosed later after getting approval of JAIF-Secretariat on eel project.

### 4. List of Completed Publications and Others

List of completed publications for the year 2017	Type of media	Attached e-file
		There is no publication in 2017 regarding the studies on tropical anguillid eels by IFRDMD.*

\* To prevent miss leading of the information for our information of the angulid eel data, all the results and related information on tropical anguillid eels that are collected through the eel studies under JTF project and also JAIF project are managed centrally and comprehensively by SEC.

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

Planned activity	Evaluation/ Views from Participants
Activity 1. Clear understanding on current situation of resources, fisheries and utilization	
Sub-activity 1.2: Survey on trends of catadromous eel fisheries	There was no evaluation from the participants of AMS.
Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels	There was no evaluation from the participants of AMS.
Activity 2. Improvement of data collection and statistics on eel fisheries	
Sub-activity 2.1: Study on catadromous eel species identification by DNA technology	There was no evaluation from the participants of AMS.
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) We have summarized the 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) We got new findings regarding the existence of large-scale eel farming industry with special facilities to improve the eel farming in certain country.
- 3) We have discussed the species identification method on glass eel/elver not only by DNA analyses but the other methods that uses morphological features and the possibility of its introduction to the fields, with the scientists in certain countries.
- 4) We have started and continued discussions with certain DoF how to establish and improve the catch statistics on anguillid eels.
- 5) The major parts of data collection of glass eel fishery are conducted continuously under new JAIF project on eel till June 2019.
- 6) To ensure the information security on eel issues in relation with the upcoming CITES Cop18 (2019), all the results and related information collected through JTF project (and also JAIF project) are managed centrally and comprehensively by SEAFDEC-SEC then not disclosed without the permission in advance.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2018

### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(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 AMSs (that would not be covered by new JAIF project on eels). The surveys will be carried out during the years of 2015 to 2019.	10,000
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.	15,000

Proposed Activity	Description of Proposed Activity	Proposed Budget
<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	Conducting studies on species identification among the genus <i>Anguilla</i> in AMS, based on DNA technology. This activity will be carried out during the years of 2015 to 2018.	35,000
Sub Activity 2.1: 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 years of 2016 to 2017.	10,000
<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 researches 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.	10,940

\*Since sub-activities 1.2, 1.3, 2.1, 2.2 and also the part of 3.1 will be conducted through the same research trips simultaneously in principle, all the contents of the estimates for travel costs at each sub-activity are set to be the same.

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

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 those would not be covered by new JAIF project on eels, forkeep 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 covered 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	Compiling the consecutive catch statistics on anguillid eels in Indonesia then analyze 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 resources and mitigating measures	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 the field surveys.

**3. Schedule of Activity for the Year 2018**

<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												

\* Field surveys under sub-activities 1.2, 1.3, 2.1, 2.2 and 3.1, 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 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

Project id: 201505002

<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC ASSP/ FCG Mechanism		
<b>Project Title:</b>	Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	IFRDMD	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 297,462
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD 86,026
<b>Project Leader:</b>	Dr. Dina Muthmainnah	<b>Involved Country:</b>	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 AMS. 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
<b>Objective 1:</b> Reviewing the activities and the methodologies for promoting inland fisheries in AMS and find a way forward for	<b>Outcome 1:</b> Understanding the present status of inland fisheries in AMS, as a basis of our consideration to	<b>Output 1:</b> <ul style="list-style-type: none"> <li>Grasping the present status of inland fisheries in the region.</li> <li>Sharing the data, information and common understanding on inland</li> </ul>	<b>Activity 1: Review of activities and methodologies for promotion of inland fisheries and find ways forward</b> Gathering the data and information on present status of inland fisheries in AMS by referring to literature, web sites, interviewing and field surveys.

Objective	Outcomes	Outputs	Activities
sustainable development of inland fisheries	find the way for sustainable development of inland fisheries in the region.	fisheries in the region among AMS. <ul style="list-style-type: none"> <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>	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.  Summarizing the various features and information on inland fisheries in AMS then publish the results as a printed matter for distribution among AMS.
<b>Objective 2:</b> Seeking and promoting the effective management measures on inland fisheries in AMS	<b>Outcome 2:</b> Building up the skeleton of the framework for the management of inland fisheries in AMS.	<b>Output 2:</b> <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 with 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> <li>• Making the map and establishing the database of habitat and inland waters resources in Southeast Asia in one format with geographic and time</li> </ul>	<b>Activity 2: Promotion of effective inland fisheries management measures</b> 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 clear the contents of the activity)</i>  Implementing the biological studies on commercially exploited species such as growth speed, maturation, habitat and seasonal/growth-related migration, for reflecting the characteristics at each species and habitat onto the appropriate fisheries management measures.  Studying the effects of several management measures on the livelihoods of fishers in inland fisheries from the perspective of socio-economic features.  Activities to make map/data-base of inland fisheries in Southeast Asia

Objective	Outcomes	Outputs	Activities
		<p>reference, that it can be accessed by the public.</p> <ul style="list-style-type: none"> <li>Finding appropriate management measures on inland fisheries in AMS that 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 AMS.</li> </ul>	<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 years’ studies, it became clear that it is difficult to find these “indicators” in concrete through the 3 years’ 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><b>Objective 3:</b> Studying and developing habitat conservation and resource enhancement measures suitable for the region</p>	<p><b>Outcome 3:</b> Establishing the comprehensive policies for the management of inland fisheries in the region with relationship with various sectors and stakeholders.</p>	<p><b>Output 3:</b></p> <ul style="list-style-type: none"> <li>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. <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><b>Activity 3: Study of habitat conservation/resources enhancement measures</b> Surveying and capacity building on studying for the development of habitat conservation and for resources enhancement measures applicable to AMS. <i>(Minor revision on wording in 2018)</i></p> <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 promotion of inland fisheries and find ways forward</p>	<ul style="list-style-type: none"> <li>Gathering the data and information on present status of inland fisheries in AMS by referring to 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> </ul>

Activity	Description
	<ul style="list-style-type: none"> <li>Summarizing the various features and information on inland fisheries in AMS then publish the results as a printed matter for distribution among AMS. (Sub-activity 1.3)</li> </ul>
Activity 2: Promotion of effective inland fisheries management measures	<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.</li> <li>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 discuss 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 AMS to enhance capacity building on improving the management on inland fisheries. (Sub-activity 2.3. <i>It was originally planned in 2018 though, it is postponed to 2019 considering the confirmation process of effectively of the measures/guidelines that would be accepted through sub-activity 2.2 in some preliminary trials.</i>)</li> </ul>
Activity 3: Study of habitat conservation/resources enhancement measures	<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 knowledge 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>

### 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 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	10,000

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 2: Promotion of effective inland fisheries management measures	Sub-activity 2.1: Studying on co-management and right-based fisheries management applicable to inland fisheries in the region	35,038 (carry forward to 2016)	20,771	20,149	71,526	20,000
	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)					10,000
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. (Extended till 2019)				13,500	5,000
	Sub-activity 3.2: Holding a workshop to develop the policy recommendation on responsible inland fisheries resources utilization in the region					25,038
	Sub-Total Budget	65,038	45,771	46,649	86,026	65,038

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

### 1. Achievements of the Project Implementation for the Present Year 2017

IFRDMD had conducted 3 sub-activities under two main activities (Activity 1 and 2) in 2017. Under these sub-activities, we conducted one in-house training, four field surveys in Philippines, Thailand, Malaysia and Viet Nam\*, and dispatching our researchers to MRC\*\* to analyze the achievements and issues that MRC had been conducted. 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.

\* The field surveys in Malaysia and Viet Nam will be conducted in September and October

\*\* This survey will be conducted in December

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

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1. Review of activities and methodologies for 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, 2017)*	I: Research	7	14	1	800**
Activity 2. Promotion of effective inland fisheries management measures					
Sub-activity 2.1 Studying on co-management and	I: Research	16	15	36	54,535**

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
right-based fisheries management applicable to inland fisheries in the region (Philippines, 7-12 May; Thailand, 31 July-6 August, Malaysia, September; Viet Nam, October, Visit MRC, October)*					
Sub-activity 2.2 Holding a workshop to develop guidelines for effective inland fisheries management in the region(Planned in Dec. 2017)*	I: Research				26,000**

\* Only the researches/activities those had been conducted till 25 Aug. are written.

\*\* These figures contain the expected expenses till the end of 2017. Research activity done in Indonesia costs USD 3,500-, done in outside of Indonesia costs USD10,000-, in average.

\*\*\* Total of the (expected) spent budget till the end of 2017 will be USD 81,335 and it exceeds the proposed budget for 2017, USD 46,649. The remaining budget carrying over from last year (USD 80,161 in total, incl. budget for "0520150101 Eel project") is also used to conduct the activities in 2017 then consumed all the budget in the end of 2017.

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

Planned activity	Expected outcome/output	Achievements
Activity 1. Review of activities and methodologies for 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 literature, web sites (also including the results of the questionnaire and the workshop those had been conducted in 2016) with the cross-checking each other. Then we summarized these features and present status at each SEAFDEC member country into the table, to reveal the similarities and differences among the countries. After we finish completion of the summary table, we ask each SEAFDEC member country to confirm, any corrections and filling out the blanks remaining in the table by the end of 2017. The completed summary table express the basic data on the features of inland capture fisheries in the region and effective for consideration and planning our future activities.
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	Understanding both present status and problems on the implementation of co-management and right-based fisheries managements in AMS and seek solution through the discussion.	IFRDMD has conducted field surveys in Philippine and Thailand for information gathering (as of 25 Aug.). Philippines has introduced the enumerator system for gathering the catch statistics at the landing places frequently. This system enabled us to gather reliable and monitor the situation of fisheries resources and their level of exploitation. Thailand also has data collection system on catch statistics by setting enumerators in the markets. They also conduct experimental operation for studying the fish biology in the wild stock. Re-stocking activities are also conducted in Thailand to enhance the production by Culture Based Fisheries in the reservoirs. In general, freshwater aquaculture is focused more than the capture fishery in Thailand.

Planned activity	Expected outcome/output	Achievements
		We also conducted In-House Training on the Features of Inland Fisheries in ASEAN region, by inviting Dr. Luky Adrianto from Bogor Agriculture University, Indonesia, to deepen the understanding of the present status and issues in Inland fisheries in the region.
Sub-activity 2.2 Holding a workshop to develop guidelines for effective inland fisheries management in the region	Finding appropriate indicators for an effective management of inland fisheries in AMS.	The workshop will be held in December 2017.

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

List of completed publications for the year 2017	Type of media	Attached e-file
IFRDMD Held the In-House Training on Features of Inland Fisheries in Southeast Asia	SEAFDEC Newsletter Vol.40 No.2, April-June 2017	

#### 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 promotion of inland fisheries and find ways forward	
Sub-activity 1.3 Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward	There was no evaluation from the participants of AMS.
Activity 2. Promotion of effective inland fisheries management measures	
Sub-activity 2.1 Studying on co-management and right-based fisheries management applicable to inland fisheries in the region	There was no evaluation from the participants of AMS.
Sub-activity 2.2 Holding a workshop to develop guidelines for effective inland fisheries management in the region	Not yet conducted.

#### 6. Major Impacts/Issues

1. Need to gather information more on inland fisheries at each area/country to understand the real situation and also to seek the key issues we should treat to achieve the sustainable use of freshwater fish resources, before considering the respective concrete management measures.
2. Need to 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.

**PART III: PROPOSED ACTIVITIES FOR YEAR 2018****1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018**

(Unit: USD)

<b>Proposed Activity</b>	<b>Description of Proposed Activity</b>	<b>Proposed Budget</b>
Activity 1. Review of activities and methodologies for 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 reflect them into the drafts for the publication.	<b>1,000</b>
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.	<b>71,526</b>
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 AMS.	<b>13,500</b>

\* Since sub-activities 2.1 and 3.1 will be conducted through the same research trips simultaneously in principle, all the contents of the estimates 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 2018**

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
Activity 1. Promotion of effective inland fisheries management measures	
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.
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.

### 3. Schedule of Activity for the Year 2018

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1. Review of activities and methodologies for 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												
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.												

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

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			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>Program Thrust:</b>	I	<b>Total Duration:</b>	2015 - 2017
<b>Lead Department:</b>	SEAFDEC/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 2017:</b>	USD 125,000
<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

<b>Objective</b>	<b>Outcomes</b>	<b>Outputs</b>	<b>Activities</b>
Objective 3: To monitor and evaluate the progress of the project	Outcome 4: Final project evaluation report.	Output 4: Final report.	Activity 4: Project Management and 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 2015-2017

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017
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
Contingency				36,000
<b>Sub-Total Budget</b>			<b>125,000</b>	<b>125,000</b>

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

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

The second disbursement with amount USD105,000 instead of USD125,000 have been received by SEAFDEC/MFRDMD in late May 2017. The fund for Indonesia and Malaysia has been transferred in Jun 2017 through bank transfer but the fund for Brunei Darussalam has been transferred in September 2017 by currier because of technical problem. There were 14 training and workshop activities were conducted under Activity 2 and 3. The second Regional Technical Consultation on Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management was organized in Makassar, Indonesia from 24 – 27 August 2017. Unfortunately, participants from Brunei Darussalam can't attend the RTC due to technical problem. Participants of RTC suggest to extend the project to conduct all planned activities due to technical problems and time constraint. Participants also suggest to conduct the next RTC in Brunei DS. Government of participating countries gave full support to continue the project after the project ended.

## 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.					
Sub-activity 2.1: Training for fisheries associations		106	2		20,000
Sub-activity 2.2: Capacity building for community leaders					
Activity 3.					
Sub-activity 3.1: Knowledge transfer and training on improving resource use practices		270	2		14,000
Sub-activity 3.2: Knowledge transfer and training on enhancing community business ventures and promoting alternative livelihood					
Sub-activity 3.3: Workshop to review the capacity building of coastal communities		14	5		14,000

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

Planned activity	Expected outcome/output	Achievements
Activity 2		
Sub-activity 2.2: Capacity building for community leaders	The capacity building program for the selected community leaders	The training for the community leaders has been identified, listed and conducted based on the feedback of the questionnaire of need assessment survey. Few program has been conducted involved 106 persons from all participating countries.
Activity 3		
Sub-activity 3.1: Knowledge transfer and training on improving resource use practices	Knowledge transfer and training program for selected communities in Brunei Darussalam, Indonesia and Malaysia	The training for the coastal communities has been identified based on the feedback of the questionnaire, prioritized and conducted. Few program has been conducted involved 270 persons from all participating countries. Among the program that have been conducted are maintenance the fishing nets, fiberglass boat repairs, post-harvest processing, helmsman, scuba diving etc.
Sub-activity 3.2: Knowledge transfer and training on enhancing community business ventures and promoting alternative livelihood		
Sub-activity 3.3: Workshop to review the capacity building of coastal communities	Regional Technical Consultation	The second Regional Technical Consultation has been conducted in Makassar, Indonesia from 24 – 27 August 2017. Unfortunately, due to the technical problem, the participants from Brunei Darussalam couldn't attend the RTC. Participants from Indonesia, Malaysia and observers from local authorities were attended the RTC.

## 4. List of Completed Publications and Others

List of completed publications for the year 2017	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 2	
Sub-activity 2.2: Capacity building for community leaders	The participants learned about the business and association management
Activity 3	
Sub-activity 3.1: Knowledge transfer and training on improving resource use practices	The participants learned how to improve the resource through the basic food hygiene, food <i>e.g.</i> seaweed and post-harvest processing. Participants also trained how to build and maintenance the fiberglass boats also the fishing nets.
Sub-activity 3.2: Knowledge transfer and training on enhancing community business ventures and promoting alternative livelihood	The participants learns the SMEs business for seaweed and aqua-tourism such as scuba diving.

## 6. Major Impacts/Issues

A relatively long time for the second disbursement has caused the few scheduled activities to be postponed. Furthermore, the limited facilities, difficulty in obtaining the instructors and the suitable time of the community members have made it difficult to carry out the planned activities.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2018

Due to some technical problems such as relatively long time of first and second disbursement, difficulty of transferring the budget to the participating country and difficulty to get the suitable trainers, MFRDMD would like to propose to extend the project until June 2018. The participating country will continue the activities as planned until June 2018 without additional budget. Project Terminal Meeting will be conducted in late March 2018 as proposed during the RTC in Makassar, Indonesia. Project evaluation will be conducted after the terminal meeting and terminal project report will be print in June 2018.

### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 2		
Sub-activity 2.3: Workshop to review the building and strengthening of fisheries associations and community leaders	MFRDMD will conduct a terminal meeting to review the final progress of the project.	18,160
Activity 4		
Sub-activity 4.1: Report, administrative cost, office supplies	Administrative and office supplies for the project	900
Sub-activity 4.2: Project evaluation and documentation	MFRDMD will conduct the evaluation project and print the terminal report of the project.	5,840

### 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 2	
Sub-activity 2.3: Workshop to review the building and strengthening of fisheries associations and community leaders	Final progress of the activities conducted in the participating country.
Activity 4	

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
Sub-activity 4.2: Project evaluation and documentation	The Terminal Report of the project.

**3. Schedule of Activity for the year 2018**

<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 2												
Sub-activity 2.3:												
Activity 4												
Sub-activity 4.2												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

		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>Program Thrust:</b>	II	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	MFRD	<b>Lead Country:</b>	Singapore
<b>Donor/Sponsor:</b>	JTF-VI	<b>Total Donor Budget:</b>	USD 279,812
<b>Project Partner:</b>	ASEAN-SEAFDEC Member Countries	<b>Budget for 2017:</b>	USD 44,572
<b>Project Leader:</b>	Ong Yihang, Senior Scientist (PHTC, 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 namely, Amnesic Shellfish Poisoning (ASP) toxin (Domoic Acid) and Azaspiracids (AZA) toxin and Brevetoxin (BTX) causing Neurotoxic Shellfish Poisoning. The project will also include a component on the identification of toxic Harmful Algal Blooms (HABs) species. This project would be implemented by Post-Harvest Technology Centre of the Agri-Food and Veterinary Authority of Singapore (PHTC/AVA) as SEAFDEC's Collaborating Center for MFRD programmes, with participation from the ASEAN-SEAFDEC Member Countries. The key project activities comprises 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-SEAFDEC 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) toxin. 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 propose 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**

<b>Objective</b>	<b>Outcomes</b>	<b>Outputs</b>	<b>Activities</b>
<b>Objective 1:</b> To upgrade regional laboratory capabilities and credibility for testing of ASP, AZA and BTX biotoxins	<b>Outcome 1:</b> 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
<b>Objective 2:</b> To establish monitoring programmes for ASP, AZA and BTX biotoxins in Member Countries for routine surveillance	<b>Outcome 2:</b> 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.
<b>Objective 3:</b> To improve knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in the ASEAN region and facilitate	<b>Outcome 3:</b> Improved knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in the ASEAN region	Regional Technical Consultation	Organization and conduct of Regional Technical Consultation, 24-25 July 2013, Singapore
		Biotoxin monitoring surveys in Member Countries	Organization and conduct of one and half-year Biotoxins Monitoring Survey in 2015-2016. Extended to end of 2017.
		End-of-Project (EOP) Meeting	Organization and conduct of End-of-Project (EOP) Meeting in 3 <sup>rd</sup> qtr 2019
		Technical Compilation	Preparation and publication of Technical Compilation in 2018/2019

Objective	Outcomes	Outputs	Activities
information exchange among Member Countries			
<b>Objective 4:</b> To improve knowledge and understanding on toxic HAB occurrences and incidences in the ASEAN region	<b>Outcome 4:</b> 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
<b>Objective 5:</b> To enhance regional capabilities for identification of toxic HAB species in Member Countries	<b>Outcome 5:</b> 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 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

Activity	Description
	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.
Activity 7: Regional Training course on Culturing for HAB Species Identification and Toxin Characterization (7days)	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 characterization 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 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

Activity	Description
	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	-	-	-	-	4,000	-	2,000	3,000
Activity 9: End-of-Project (EOP) Meeting	-	-	-	-	-	-	-	37,748
	<b>Sub-Total</b>	<b>35,500</b>	<b>28,700</b>	<b>49,200</b>	<b>40,344</b>	<b>40,748</b>	<b>44,572</b>	<b>40,748</b>

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

### 1. Achievements of the Project Implementation for the Present Year 2017

#### Biotoxin Monitoring Survey

All ASEAN-SEAFDEC Member Countries have been informed of the extension of the biotoxin monitoring survey until the end of 2017. Indonesia, Malaysia, Myanmar, Singapore and Thailand have conducted the survey according to their sampling plans and submitted the quarterly progress reports as required. Lao PDR, Philippines and Viet Nam have yet to submit any quarterly reports even though the surveys were supposed to have started in the respective countries.

#### Regional Training Course on Specimen Preservation and its Application in HAB Monitoring and Studies

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 10 - 13 July 2017. The training course included both lectures and practicals on specimen preservation methods and techniques, use of fluorescence and electron microscopy and flowcytometry. A total of 22 participants from the 9 ASEAN-SEAFDEC Member Countries (except Myanmar) attended the training. The participants provided positive feedback that the course was well conducted and 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 3: Biotoxins Monitoring Survey	I. Research and Development	9	0	0	9,000 (estimated)
Sub-activity 3.2: Implementation of Biotoxins Monitoring Survey					
Activity 6: Regional Training Course on Specimen Preservation and its Application in HAB Monitoring and Studies	II. Training	20	2 (MFRD)	0	22,099.24

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

Planned activity	Expected outcome/output	Achievements
Activity 3: Biotoxins Monitoring Survey	<ul style="list-style-type: none"> <li>• Completion of the surveys carried out in at least 8 ASEAN-SEAFDEC Member Countries.</li> <li>• Submission of technical reports by Member Countries on the conduct and results of their monitoring surveys.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Surveys have been carried out in 9 Member Countries except Cambodia.</li> <li>➤ The results of the sampling and monitoring carried out during the survey have provided Member Countries with a better knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in their country.</li> </ul>
Activity 6: Regional Training course on Specimen Preservation and its Application in HAB Monitoring and Studies	<ul style="list-style-type: none"> <li>• Organization and conduct of the training course in 2<sup>nd</sup> quarter 2017 (in collaboration with IOES-UM).</li> <li>• Participation by at least 8 ASEAN-SEAFDEC Member Countries.</li> <li>• Enhanced capabilities on specimen preservation for HAB monitoring and studies.</li> </ul>	<ul style="list-style-type: none"> <li>➤ A total of 22 participants from 9 ASEAN-SEAFDEC Member Countries (except Myanmar) attended and benefitted from the training which was successfully conducted by regional and Japanese experts on 10-13 July 2017.</li> <li>➤ The training enhanced the participants' knowledge and capabilities on specimen preservation methods and techniques, and the use of fluorescence and electron microscopy and flowcytometry, for HAB monitoring and studies</li> </ul>

### 4. List of Completed Publications and Others

List of completed publications for the year 2017	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 6: Regional Training course on Specimen Preservation and its Application in HAB Monitoring and Studies	Participants indicated in the feedback forms that the training was well organized and the trainers were very knowledgeable and helpful. The general consensus among the participants was that the training course had met their expectations and was beneficial to their work.

### 6. Major Impacts/Issues

- The training course enhanced capabilities of Member Countries in specimen preservation.
- For the next training course in 2018, some participants suggested to include further training on molecular detection techniques such as primer and probe designs for PCR while agreeing that the proposed training on culturing for HAB species identification and toxin characterization is equally important.
- No major issues in project implementation in 2017 except that some Member Countries have yet to submit quarterly progress reports for the biotoxin monitoring surveys to date despite repeated reminders.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 7: Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization	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 characterization 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.	42,572
Activity 8: Technical Compilation	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, the results and reports (submitted. It will be published in the project's final year in 2019. The Technical Compilation will comprise 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.	2,000

#### 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
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.</li> <li>Participation by at least 8 ASEAN-SEAFDEC Member Countries.</li> </ul>
Activity 8: Technical Compilation	<ul style="list-style-type: none"> <li>Consolidation of quarterly reports and technical reports by Member Countries on the conduct and results of their monitoring surveys into a technical compilation.</li> <li>Preparation of the draft Technical Compilation</li> </ul>

#### 3. Schedule of Activity for the Year 2018

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 7: Regional Training Course on Culturing for HAB Species Identification and Toxin Characterization												
Activity 8: Technical Compilation												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

		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>Program Thrust:</b>	II	<b>Total Duration:</b>	2015 - 2017
<b>Lead Department:</b>	MFRD	<b>Lead Country:</b>	Singapore
<b>Donor/Sponsor:</b>	Singapore	<b>Total Donor Budget:</b>	USD 136,120
<b>Project Partner:</b>	ASEAN-SEAFDEC Member Countries	<b>Budget for 2017:</b>	USD 48,440
<b>Project Leader:</b>	Tay Kai Ying, Scientist (PHTC, AVA)	<b>Involved Country:</b>	ASEAN-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 countries and serves as an important source of foreign exchange and food supply for these countries. There is an increasing demand for seafood as consumers around the world recognize their nutritional value. However, seafood is very perishable and several chemical and biological changes occur immediately after capture and/or harvest. The deterioration process of seafood quality by microbiological metabolism, oxidative reaction and enzymatic activity 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 member countries 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
<b>Objective 1:</b> To assist in upgrading the regional seafood industry in cold chain management and technologies.	<b>Outcome 1:</b> Establishment and improvement of cold chain management and technologies in the regional seafood industry.	<b>Output 1:</b> Workshop on Cold Chain Management of Seafood. <b>Output 2:</b> Supply Chain/ Cold Chain Pilot Trials	<b>Activity 1:</b> Organization and conduct of Project Inception and Planning Meeting, 19 – 20 May 2015, Singapore. <b>Activity 2:</b> Organization and conduct of Workshop on Cold Chain Management for Seafood, 17 – 19 November 2015, Singapore. <b>Activity 3:</b> Organization and conduct of one-year Supply Chain/ Cold Chain pilot trials in participating Member Countries in 2016. <b>Activity 4:</b> Organization and conduct of Project Evaluation and Progress Meeting, 25 – 27 July 2017, Singapore.

Objective	Outcomes	Outputs	Activities
<b>Objective 2:</b> To develop generic guidelines on cold chain management for the seafood industry in the region.	<b>Outcome 2:</b> Development of generic guidelines on cold chain management for seafood.	<b>Output 3:</b> Generic guidelines on cold chain management for seafood.	<b>Activity 5:</b> Preparation and publication of Guidelines on Cold Chain Management for Seafood in 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	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.  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.
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	Description
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

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017
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>48,440</b>

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

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

#### Activity 4: Project Evaluation and Progress Meeting

The Project Evaluation and Progress Meeting was successfully conducted in Singapore from 25 - 27 July 2017. The Meeting was attended by 21 participants from both government and private sectors of 10 ASEAN-SEAFDEC member countries. One of the expert trainers at the previous workshop on cold chain management for seafood held in 2015 was invited to participate in the Meeting to help facilitate the discussion on the draft Guidelines on Cold Chain Management for Seafood. 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. The Meeting also discussed and prepared the preliminary draft of the Guidelines on Cold Chain Management for Seafood.

#### Activity 5: Preparation and publication of Guidelines on Cold Chain Management for Seafood

The preliminary draft of the Guidelines on Cold Chain Management for Seafood has been edited by MFRD and the first draft of the Guidelines will be circulated to all 10 Member Countries for further comments by their relevant competent authorities before finalization and endorsement during the End-of-Project Meeting. The Guidelines will then be published for distribution to ASEAN member countries

**Activity 6: End-of-Project Meeting**

The End-of-Project Meeting will be organized in Singapore (or another Member Country as agreed) in the 4<sup>th</sup> quarter 2017 to share the results of the project and to finalise and endorse the final draft of the Guidelines by the Member Countries. The final results and data of the cold chain pilot trials will also be discussed and shared among the Member Countries.

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

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 4: Project Evaluation and Progress Meeting	VI. Others	21 from 10 Member Countries	-	-	26,949.25
Activity 5: Preparation and publication of Guidelines on Cold Chain Management for Seafood	IV. Policy development activities	10 Member Countries	-	-	5,000 (Estimated)
Activity 6: End-of-Project Meeting	VI. Others	10 Member Countries	-	-	21,720 (Estimated)

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

Planned activity	Expected outcome/output	Achievements
Activity 4: Project Evaluation and Progress Meeting	Organization and conduct of Mid-term Evaluation and Progress Meeting in 1 <sup>st</sup> quarter of 2017.	<ol style="list-style-type: none"> <li>1. The 3-day meeting was successfully organized and conducted in Singapore from 25-27 July 2017.</li> <li>2. The Meeting was attended by 21 participants from both government and private sectors of 10 SEAFDEC member countries.</li> <li>3. The progress, challenges and issues faced by participating Member Countries in the cold chain pilot trials were discussed.</li> <li>4. The preliminary draft of the Guidelines on Cold Chain Management for Seafood was discussed and prepared.</li> <li>5. Future activities such as publication of the Guidelines and End-of-Project Meeting were discussed and planned.</li> </ol>
Activity 5: Preparation and publication of Guidelines on Cold Chain Management for Seafood	<ol style="list-style-type: none"> <li>1. Draft of Guidelines on Cold Chain Management for Seafood to be developed by Member Countries.</li> <li>2. Publication of the Guidelines.</li> </ol>	<ol style="list-style-type: none"> <li>1. The preliminary draft of the Guidelines has edited into a first draft which will be circulated to all Member Countries for further comments and/or amendments by their relevant competent authorities.</li> <li>2. The first draft will then be revised by MFRD to incorporate the comments and amendments by Member Countries' relevant competent authorities into a final draft of the Guidelines.</li> <li>3. The final draft Guidelines will be finalized and endorsed at the End-of-Project Meeting for publication.</li> </ol>
Activity 6: End-of-Project Meeting	Organization and conduct of End-of-Project Meeting in 4 <sup>th</sup> qtr of 2017	<ol style="list-style-type: none"> <li>1. A 2/3-day meeting in Singapore or another Member Country will be conducted in the 4th qtr of 2017.</li> <li>2. The final draft of the Guidelines will be finalised and endorsed for publication during the meeting.</li> <li>3. The final results and data of the cold chain pilot trials will also be discussed and shared among the Member Countries.</li> </ol>

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

List of completed publications for the year 2017	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 4: Project Evaluation and Progress 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.
Activity 6: End-of-Project Meeting	The meeting has yet to be conducted in 4 <sup>th</sup> quarter 2017

#### 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 Lao PDR on the procedure to purchase and obtain the software licence while Cambodia has sought assistance from other Member Countries like Thailand. 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 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated budget for the year 2018

Nil. The project on Cold Chain Management for Seafood is scheduled to be completed in 2017.

#### 2. Expected Outcomes/Outputs of Activity for the Year 2018

Nil. The project on Cold Chain Management for Seafood is scheduled to be completed in 2017.

#### 3. Schedule of Activity for the Year 2018

Nil. The project on Cold Chain Management for Seafood is scheduled to be completed in 2017.

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			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>Program Thrust:</b>	II	<b>Total Duration:</b>	II
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 362,756
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD 103,000
<b>Project Leader:</b>	Chihaya Nakayasu	<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) 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	Outcomes	Outputs	Activities
<b>Objective 1:</b> To develop and accelerate rapid and effective fish and shrimp health management	<b>Outcome 1:</b> Development and acceleration of rapid and effective fish and shrimp health management.	<b>Output 1:</b> Establishment of the early and effective intervention strategies through strict monitoring of the health status on cultured shrimp and fish by the farmers.	<b>Activity 1: Development and acceleration of rapid and effective fish and shrimp health management</b> <ul style="list-style-type: none"> <li>Determination of threshold infection levels for WSSV, AHPND and VNN at different age/weight ranges</li> <li>Development of optimized q-PCR protocols for the detection of AHPND</li> </ul>
<b>Objective 2:</b> To enhance efficacy of vaccine treatment in tropical cultured species	<b>Outcome 2:</b> Enhancement of efficacy of vaccine treatment in tropical cultured species.	<b>Output 2:</b> 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.	<b>Activity 2: Enhancement of efficacy of vaccine treatment in tropical cultured species</b> <ul style="list-style-type: none"> <li>Examination of the field efficacy of the formalin-inactivated NNV vaccine in high value marine fishes (groupers, sea bass, pompano [depending on availability]) in areas, <i>i.e.</i> locally and in SE Asian countries (through collaboration with private fish farmers), where there have been serious cases or outbreaks of VNN.</li> </ul>

Objective	Outcomes	Outputs	Activities
		Development of the method of delivering vaccine to shrimp with increased efficacy and prevention of white spot disease by interfering with its replication in the host.	<ul style="list-style-type: none"> <li>Evaluation of the efficacy of RNAi in protecting shrimp against WSSV infection</li> <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>
<b>Objective 3:</b> To establish protective measures against persistent and emerging parasitic diseases of tropical fish	<b>Outcome 3:</b> Establishment of protective measures against zoonotic diseases of fish.	<b>Output 3:</b> Establishment of practical and efficient protocol for the prevention and control of persistent and emerging fish parasites	<b>Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish</b> <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>
<b>Objective 4:</b> To identify risk factors and develop protective measures against Early Mortality Syndrome (EMS) /Acute Hepatopancreatic Necrotic Disease (AHPND)	<b>Outcome 4:</b> Development of protective measures against emerging diseases.	<b>Output 4:</b> Establishment of practical and effective methods for the prevention and control of EMS	<b>Activity 4: Epidemiology of the Early Mortality Syndrome (EMS)</b> <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>
<b>Objective 5:</b> To extend & demonstrate technology to practitioners, officers, etc. of member countries	<b>Outcome5:</b> Technology extension and demonstration to practitioners, officers, etc. of Member Countries through training courses.	<b>Output5:</b> 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.	<b>Activity 5: Technology extension and demonstration</b> <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 marine finfish culture and shrimp farming in most Asian countries and in the world. With the occurrence of devastating fish viral diseases like Viral Nervous Necrosis (VNN) and Iridovirus in marine finfish, the establishment of preventive management strategies to maintain the disease-free status of fish stocks should be done. Likewise, the continued occurrence of White Spot Syndrome Virus (WSSV), Infectious Hypodermal Hematopoietic Necrosis Virus (IHHNV), Monodon baculovirus (MBV) and the emergence of Early Mortality Syndrome (EMS) necessitate the establishment of domesticated shrimp stocks that are free of these viral and bacterial pathogens. Early detection of these devastating pathogens is the most efficient response to be

Activity	Description
	<p>able to implement immediate and appropriate interventions for the control of the spread of infection. Prompt diagnosis will give fish and shrimp farmers better health management of their stocks which will in turn minimize the losses due to diseases. Molecular-based techniques such as the use of polymerase chain reaction (PCR), quantitative polymerase chain reaction (q-PCR) and loop mediated isothermal amplification (LAMP)-based detection methods will be considered. Development and optimization of conventional and quantitative polymerase chain reaction-based detection methods will enable farmers to strictly monitor health status so that early and effective intervention strategies can be implemented. Adoption and development of LAMP offers a cheaper, more rapid and convenient detection method for existing and emerging shrimp and fish pathogens. These developed and optimized practical molecular diagnostic tools will be primarily adopted in Fish Health Diagnostic Laboratories. (Locations: Philippines and other Member Countries concerned)</p>
<p>Activity 2: Enhancement of efficacy of vaccine treatment in tropical cultured species</p>	<p>Sub-activity 2.1 Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish            The objective of the study is to develop and adopt methods that would enhance the efficacy of the present NNV vaccines through the use of immunoadjuvants and other substances that promote the activation of antiviral responses in marine fish. Methods for vaccine production for NNV will be adopted from earlier (JTF5) studies. The efficacy of vaccine containing the immunoadjuvant(s) will be tested in fish through injection or via feed encapsulation and delivered orally through feeding. Fish will be experimentally challenged with NNV after booster vaccination, as established previously. Efficacy of the vaccines will be evaluated based on relative percent survival (RPS). The expected output from the study is a practical method of delivering vaccine to fish with increased efficacy thereby preventing unwarranted outbreaks of VNN in hatcheries and grow-out culture systems. (Location: Philippines and other Member Countries concerned)</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</p>	<p>Early Mortality Syndrome (EMS) otherwise known as Acute Hepatopancreatic Necrosis Syndrome (AHPNS) is an emerging disease</p>

Activity	Description
(EMS) /Acute Hepatopancreatic Necrotic Disease (AHPND)	affecting most Southeast Asian Countries whose putative disease-causing agent has been confirmed recently to be <i>Vibrio parahaemolyticus</i> . This study will try to develop protective measures based on the etiological agents together with identification of risk factors and protective factors. Visit to farms with (EMS/AHPNS) outbreaks (Thailand, Viet Nam, and Indonesia) will be undertaken to collect samples and other farm data. Samples of EMS/AHPNS –“infected” shrimp will be analyzed using histopathological techniques. Measures to exclude the pathogen from the farm, good management practices, good nutrition, and proper handling of the fish to prevent unnecessary stress to the animals will be formulated. From these broad measures, specific protocols to prevent the outbreak of this disease will be developed in cooperation with farmers and hatchery operators. Expected output of the study will be specific recommendations and guidelines to protect shrimp from EMS/AHPNS. (Location: Member Countries concerned)
Activity 5: Technology extension and demonstration	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	<p>Sub-activity 7.1 Annual progress meeting Annual meeting organized by SEAFDEC/AQD is held to review the project achievement. Evaluators will be invited to join the meeting to review/evaluate the project achievements.</p> <p>Sub-activity 7.2 International workshop The workshop, not only receive participants from member countries, but also invite expert scientists as key note speakers to facilitate to spread and exchange brand-new information on fish health management between SEAFDEC and various institutions.</p>
Activity 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 2013-2017

(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	11,000	8,800	8,800	10,800	8,800

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
	adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV					
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	5,000
Activity 7: Annual progress meeting and international workshop	Sub-activity 7.1: Annual progress meeting	5,000	4,000	4,000	4,000	4,000
	Sub-activity 7.2 : International workshop	0	0	0	0	25,000
Activity 8: Coordination by the project leader		6,438	4,159	5,000	5,000	4,159
	<b>Sub-Total Budget</b>	<b>81,438</b>	<b>66,159</b>	<b>67,000</b>	<b>103,000</b>	<b>96,159</b>

## PART II: ACHIEVEMENT OF 2017 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 3 weight ranges have been conducted. Initial run for timecourse experiment to determine the viral load using q-PCR for ABW 3.81 g was conducted. Examination of the field efficacy of the formalin-inactivated NNV vaccine previously developed in JTF5, Activity 2-1) Examination of the field efficacy of the formalin-inactivated NNV vaccine previously developed in JTF5, Activity 2-2) *In vivo* evaluation of the dsRNA efficacy in protecting shrimp against WSSV Activity 3) Acute toxicity bioassays to determine the 96 h LC<sub>50</sub> value of garlic extract using allicin powder and oral treatments using allicin powder-supplemented diet, Activity 4) Efficiency of the greenwater system (mussel) against EMS/AHPND bacteria is on-going, and Activity 5) Assessment of training needs for capacity building of SEAFDEC member countries.

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

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 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 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	II: Training Not applicable at the moment.				14,000

## 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, AHPND and VNN at different age/weight ranges	Standard curve has been established using WSSV plasmid. Preliminary infection experiment for determination of LD <sub>50</sub> were conducted for the 3 weight ranges (3.81, 7.42 and 16.83 g) which showed that LD <sub>50</sub> at viral dilution of 10 <sup>-6</sup> were achieved faster in smaller weight range (9 days for ABW 3.41 g) compared to bigger weight range (10 days for ABW 7.42 g). LD <sub>50</sub> for ABW 16.83 g was achieved with lower viral dilution of 10 <sup>-5</sup> at 9 days. Initial run for timecourse experiment to determine the viral load using q-PCR for ABW 3.81 g was conducted.
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	Evaluation for the Field efficacy of formalin-inactivated NNV vaccine previously developed in GOJ-TF5	The field efficacy of the Philippine strain of NNV (OSGBF1E) (pre-inactivation titer of 10 <sup>9</sup> TCID <sub>50</sub> / ml) is currently being evaluated via intraperitoneal injection in orange-spotted grouper ( <i>E. coioides</i> ) reared in net-cages in earthen pond. Blood sampling for NNV-neutralizing antibody titer at 1 mos post-vaccination (pv) has already been conducted and

Planned activity	Expected outcome/output	Achievements
		succeeding samplings will be done at 2, 3, 4, 5 and 6 mos pv. Since natural outbreak of VNN did not occur in the pond at 1 mos pv, groupers were randomly collected and challenged with NNV in the the laboratory. Virus challenge of groupers in tank is ongoing.
Sub-activity 2.2 Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	To develop a vaccination scheme using a combination of the two antiviral treatments (rVP28 vaccination and rVP28 RNAi treatment).  To develop a low-cost delivery protocol for the antiviral treatments in tanks.	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 the remaining part of 2017, 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	To evaluate efficacy of garlic extract using allicin powder against parasites infecting the grouper ( <i>E. coioides</i> ) and Nile tilapia ( <i>Oreochromis niloticus</i> ).	Acute toxicity bioassays to determine the 96 h LC <sub>50</sub> value of allicin powder were carried out in static systems. Results showed that the median lethal concentration (LC <sub>50</sub> ) of allicin powder to grouper for 24, 48, 72 and 96 h of exposure are 172.37, 168.52, 134.90 and 73.63 ppm respectively. Oral treatments using allicin powder-supplemented diet (0.10%, 0.50%, and 1.0%) and a control diet without allicin were tested on groupers infected with <i>P. lantauensis</i> for 14 days. Results showed that groupers fed with allicin powder supplemented diets showed reduced prevalence and mean intensity of monogenean parasites as compared to the control. Histopathological analysis is on going. The efficacy of garlic extract in the form allicin powder against parasites (protozoans) infecting tilapia ( <i>O. niloticus</i> ) will be investigated.
Activity 4 Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)	To investigate efficacy of mussels against AHPND. To investigate factors affecting the efficiency of the greenwater system (mussel) against AHPND.	The experiment on the efficacy of mussels against AHPND is on-going.
Activity 5 Technology extension and demonstration	Assessment of training needs for capacity building of SEAFDEC member countries	1) An on-site training course on fish parasitology will be conducted in Lao PDR in October 2017. 2) A training course on aquatic bacteriology will be conducted in Cambodia in November 2017. This is in response to the request of Mr. Dara, director of MARDeC, Sihanoukville, to assist the institute in developing the Bacteriology Section of the Center. 3) A follow up specialized training course on bacteriology focusing on the detection of marine bacterial pathogens will be conducted in Myanmar in November 2017. Also, as per request of the head of the Aquatic Animal Health

Planned activity	Expected outcome/output	Achievements
		Laboratory of the DOF, during the training, SEAFDEC staff/ trainers will assist or provide some experts inputs relevant to the operations of the newly established DOF's Aquatic Animal Health Laboratory in Mandalay.

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

List of completed publications for the year 2017	Type of media	Attached e-file
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	

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

Planned activity	Evaluation/ Views from Participants
Activity 1 Development and acceleration of rapid and effective fish and shrimp health management	
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 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	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 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(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	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	Field trial of the formalin-inactivated NNV vaccine in groupers reared in net-cage in pond currently being conducted in Dumangas Brackish Water Station will be rerun in 2018 to ascertain the field efficacy of the NNV-inactivated vaccine. The formalin-inactivated NNV vaccine with immunoadjuvant ( <i>Vibrio</i> sp.) will be also field tested in 2018.	8,800
Sub-activity 2.2 Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	Field trial using microparticle-feed delivered antiviral 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).	8,800
Activity 3 Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	In 2018, the efficacy of garlic as anti-parasitic agents such as toxicity tests, in vitro parasites survival, bath treatment and oral treatment against parasites will be investigated in marine and freshwater fish species (pompano and catfish).	8,800
Activity 4 Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)	Efficiency of greenwater using a mussel in a simulated tank experiment will be elucidated. Preliminary experiments to determine the effect of a macro-algae on VP <sub>AHPND</sub> will be done in small aquaria.	8,800
Activity 5 Technology extension and demonstration	Because significant mortalities of freshwater fish species due to parasitic and bacterial diseases have been a persistent problem in Lao PDR, a 5-day specialized training course on fish parasitology and bacteriology will be conducted in 2017. 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 of freshwater fish species. In addition, emphasis on hands-on exercises will be targeted as such will be necessary in the conduct of accurate disease diagnosis. A workshop on research proposal preparation will be also conducted.	14,000
Activity 6 Publication		0
Activity 7 Annual progress meeting and international		

Proposed Activity	Description of Proposed Activity	Proposed Budget
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.	4,000
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.	5,000

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

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. Production of recombinant protein (toxins Pir-A and Pir-B) <ul style="list-style-type: none"> <li>- <i>The target sequence will be obtained from available sequences in Genebank.</i></li> </ul> </li> <li>2. Screening of experimental animal, tissue passage and preparation of bacteria</li> <li>3. Preliminary infection experiment by injection and immersion to determine test concentrations based on LD<sub>50</sub></li> <li>4. Infection experiment (Timecourse) <ul style="list-style-type: none"> <li>- <i>Determination of the concentrations during the differential production of toxins Pir-A and Pir-B that causes toxicity</i></li> </ul> </li> </ol>
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	<ol style="list-style-type: none"> <li>1. Field efficacy of the formalin-inactivated NNV vaccine in terms of immunogenicity (kinetics of NNV-neutralizing antibody) and conferment of protection (relative percent survival) in grouper elucidated</li> <li>2. NNV titers in the brains and kidneys of surviving and dead fish in both vaccinated and unvaccinated fish examined</li> <li>3. Field efficacy of the immunoadjuvanted NNV- inactivated vaccine in groupers evaluated</li> </ol>
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	<ol style="list-style-type: none"> <li>1. Factors associated with the susceptibility or resistance of fish to parasite infection elucidated.</li> <li>2. Hematological profile of -infected and non-infected fish established.</li> <li>3. Practical strategies for the prevention of parasite infestation in fish formulated.</li> </ol>
Activity 4 Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)	Efficiency of greenwater using a macroalgae is elucidated. Identified factors affecting the efficiency of the macroalgae against VP <sub>AHPND</sub> .

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 5 Technology extension and demonstration	<ol style="list-style-type: none"> <li>1. Persistent diseases (parasitic, bacterial, viral) affecting economically important fish species in Lao PDR, Cambodia, and Myanmar accurately diagnosed by Fish Health personnel using standard procedures</li> <li>2. Practical and economically sound disease prevention and control strategies appropriate for the identified problem effectively formulated and accordingly disseminated to fish farmers</li> <li>3. Linkage/ collaboration between DOF staff and industry practitioners/ academe strengthened through participation/ discussions during the on-site training</li> <li>4. Basic research on fish disease carried out by fish health personnel and research outputs published in refereed journals.</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 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 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 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			Project id: 012013005
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of Countermeasures to Reduce IUU Fishing		
<b>Program Thrust:</b>	III	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	Malaysia
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 366,100
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD 40,645
<b>Project Leader:</b>	Kongpathai Saraphaivanich	<b>Involved Country:</b>	SEAFDEC Member Countries

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

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

In every country in the Southeast Asian Region, efforts are now focusing on the promotion of sustainable fisheries management and countermeasures against IUU fishing. The recognition on the importance of fishing management schemes such as fishing license, boats 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: 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 by updating RFVR Database and strengthening capacity building on PSM implementation. Moreover, these activities were raised up in the high level meeting such as SEAFDEC Council Meeting, FCG-ASSP, SOM, and ASEAN Meeting, where it was agreed that all activities are important as 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
<b>Objective 1:</b> Improving Counter measures to reduce IUU fishing	<b>Outcome 1:</b> Coordination, cooperation and application of countermeasure to reduce IUU fishing activities by Member Countries	Output 1: Regional Fishing Vessel Record database in the region	Activity 1: Promotion and development of the regional fishing vessels record (RFVR)
<b>Objective 2:</b> Strengthening awareness building and common understanding on counter measures to reduce IUU fishing		Output 2: Countries awareness building and common understanding of Port State Measure activities as a tool to reduce IUU fishing	Activity 2: Strengthening of Port State Measures and other surveillance measures in the region Activity 3: Production of information materials

#### 3.2 Overall Scope/Description of Project

Activity	Description
1) Promotion of Regional Fishing Vessels Record (RFVR)	<p>Sub-activity 1.1: Development and management of RFVR Database</p> <p>Follow up the approval of the 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 and developed in collaboration with SEAFDEC Member Countries. The database will use as tool to combat IUU fishing in the region.</p> <p>Sub-activity 1.2: Technical workshop on RFVR database development and management</p> <p>The technical workshop will be organized 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>Sub-activity 1.3: Technical assistant on using of RFVR Database</p> <p>The technical assistance on using of RFVR database and existing mechanism in 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>
2) Strengthening of Port State Measures and other surveillance measures in the region	<p>Sub-activity 2.1: Providing technical assistant on PSMs facilities and existing mechanism in SEAFDEC Member Countries</p> <p>The technical assistance on PSMs facilities and existing mechanism in SEAFDEC</p>

Activity	Description
	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.  Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region  In this activity, regional consultations to discuss and facilitating implementation of PSM in the region will be organized in collaboration with SEAFDEC Secretariat.
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		21,000
	Sub-activity 1.3: Technical assistant on using of RFVR Database			3,520	10,000	10,000	4,000	9,000
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	23,000	9,000			21,000	20,643	21,000
	Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region		10,400		18,400	20,000	2,000	20,000
Activity 3 Production of information materials		2,000	500	1,000	1,000	1,000	1,094	2,000
	<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>73,000</b>

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

### 1. Achievements of the Project Implementation for the Present Year 2017

- Updating and collaboration of AMSs on RFVR 24 meters in length and over.
- Strategies and way forward for Asian Member States and SEAFDEC to prevent, deter and eliminate IUU fishing through utilization of RFVR
- Strengthen system of fishing license and vessel registration in Cambodia
- Regional cooperation on the support and capacity building to 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	The RTC on RFVR will organized on 12-14 September 2017			
Sub-activity 1.3: Technical assistant on using of RFVR Database	Policy		3		2,600
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	The regional training course on PSM will organized in November 2017			
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
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 utilization of RFVR
Sub-activity 1.3: Technical assistant on using of RFVR Database	Regional Fishing Vessel Record database in the region	Facilitation and supporting Cambodia to development database on fishing license and vessel registration.
Activity 2: Strengthening of Port State Measures and other surveillance measures in the region		
Sub-activity 2.1: Providing	Awareness building of	Regional cooperation on the support and capacity

Planned activity	Expected outcome/output	Achievements
technical assistant on PSMs facilities and existing mechanism in SEAFDEC Member Countries	countermeasures as a tool to reduce IUU fishing in the region	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	The report of RTC on RFVR

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

List of completed publications for the year 2017	Type of media	Attached e-file
The report of “The Regional Technical Consultation on Evaluation of Implementation and Utilization of the Regional Fishing Vessel Record (RFVR) for 24 meters in length and over as a Management Tool Toward Combating IUU Fishing in ASEAN” (The report will make and print after September 2017)	Hardcopy and e-file	

#### 5. Major Impacts/Issues

Lack of expert on vessel inspection on Port State Measure therefore the close cooperation with other organization to support the implementation of Port State Measures should be conducted. Moreover, the annual updating of information on the RFVR Database has been done when the information is submitted to TD through cooperation with AMS to develop of RFVR database in real-time and friendly user.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(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	The meeting and communication with National Focal Point from concern Member Countries will be conducted for updating the information of the RFVR Database. Moreover, the capacity building of project team will be conducted to develop the RFVR database	12,908
Sub-activity 1.3: Technical assistant on using of RFVR Database	The technical assistance on using of RFVR database will be conducted depend on the problem and request from each concern Member Countries through monitoring real usage of RFVR Database in collaboration with NFP and RFPN	4,000
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 On-site Training on Vessel Inspector will be organized in collaboration with partner. The training aims to capacity building of AMS. Three countries will be selected in this year through support the implementation on PSM for their country.	22,643
Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region	Participation in the meeting and discussion as regional cooperation with partner	2,000
Activity 3: Production of information materials	Production on information and promotional materials such as poster, guidebook on usage of RFVR in each case and <i>etc.</i> will be created disseminated to the SEAFDEC Member Countries and worldwide.	1,094

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
<b>Activity 1: Promotion of Regional Fishing Vessels Record (RFVR)</b>	
Sub-activity 1.1: Development and management of RFVR Database	Updating and improving data and information
Sub-activity 1.3: Technical assistant on using of RFVR Database	Facilitation and supporting Member Countries to development database on fishing license and vessel registration.
<b>Activity 2: Strengthening of Port State Measures and other surveillance measures in the region</b>	
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
Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region	Cooperation and capacity building staff concern of target Member Countries on PSM implementation in the region
<b>Activity 3: Production of information materials</b>	Countries awareness building and common understanding of countermeasures to reduce IUU fishing in the region

## 3. Schedule of Activity for the Year 2018

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 1.3: Technical assistant on using of RFVR Database												
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 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

				Project id:20130401
<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>Program Thrust:</b>	III	<b>Total Duration:</b>	2013-2019	
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Singapore	
<b>Donor/Sponsor:</b>	JTF VI	<b>Total Donor Budget:</b>	USD181,442	
<b>Project Partner:</b>	Secretariat	<b>Budget for 2018:</b>	USD 29,896	
<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 analyzed 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-scale fishery	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 Fish and Fishery Products from IUU Fishing Activities into the Supply

Activity	Description
	Chain” under the ASEAN framework. MFRDMD will assist SEAFDEC Member States to implement the 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							25,000
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
	Sub-Total Budget	33,000	18,000	33,000	12,884	27,331	29,896	27,331

## PART II: ACHIEVEMENT OF 2017PROJECT IMPLEMENTATION

### 1. Achievements of the Project Implementation for the Present Year 2017

MFRDMD compiled and summarized the feedback from (6) AMSs on current status, issues and possible actions to promote the implementation of the ASEAN Guidelines based on the questionnaires. MFRDMD will discuss the recommended actions to implement the guidelines in AMSs based on the summarization during the “2<sup>nd</sup> 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” that will be held from 21 to 23 November 2017 in Kuala Lumpur. The meeting report will be published in 2018.

MFRDMD collaborated with the SEAFDEC/Sec to established 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 four (2) on-site testing activities on eACDS through meetings and discussions with the relevant stakeholders and relevant government officials in Brunei Darussalam.

## 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	10	8 MFRDMD, 2 TD/Sec		24,000
Activity 2					
Sub-activity 2.2: Consideration of possible solutions to the problems	Information (will be discussed in the RTC)	10	2 MFRDMD		0
Activity 3					
Sub-activity 3.1: Establishment and dissemination of a catch documentation scheme for ASEAN countries	Policy Development	12 Brunei DS	3MFRDMD,4SEAFDEC/Sec	4	3,331

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

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.1: Core Expert Meetings	The Regional Technical Consultation (RTC) for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain"	"2 <sup>nd</sup> 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 from 21 to 23 November 2017 in Kuala Lumpur, Malaysia to clarify current status and issues in preventing trade of IUU fishing related products in each Member Country in reference to the statements in the ASEAN Guidelines. The meeting report will be published in 2018.
Activity 2		
Sub-activity 2.2: Consideration of possible solutions to the problems	Compilation of current status, issues and the possible actions in preventing trade of IUU fishing related products in each Member Country in reference to the statements in the ASEAN Guidelines	MFRDMD compiled and summarized the feedback from 6 AMSs on current status, issues and possible actions to promote the implementation of the ASEAN Guidelines based on the questionnaire. MFRDMD will mainly discuss the possible actions with AMSs based on the summarization during the "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".
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 eACDS (electronic ASEAN Catch Documentation Scheme) was launched during the Meeting of SEAFDEC Council in Brunei Darussalam in April 2017. In 2017, MFRDMD in collaboration with SEAFDEC/ Secretariat conducted four (4) onsite establishment and implementation activities on eACDS through meetings and

Planned activity	Expected outcome/output	Achievements
		discussions with the relevant stakeholder and government servants in Brunei Darussalam. MFRDMD disseminated information on the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain, provide input regarding fish species code and specific data needed to establish the e-ACDS and enhancing traceability of marine capture fisheries in Brunei Darussalam. The progress of the pilot project on e-ACDS in Brunei Darussalam will be presented during the IUU RTC.

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

List of completed publications for the year 2017	Type of media	Attached e-file
1. Report of the "2016 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, Mazalina Ali and Ahmad Firdaus Siregar Abdullah (2017) Recommended Actions to Implement the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products From IUU Fishing Activities into the Supply Chain	Print	-

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1 Core Expert Meetings	The participants learned about 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 learnt the usage of eACDS during the onsite testing for establishment and implementation of the eACDS.

#### 6. Major Impacts/Issues

Effective coordination of several related programs in relation with combating IUU fishing in the Southeast Asian region should be considered. The cooperation of each AMSs is very important for successful implementation of the ASEAN Guidelines. All AMSs are requested to send the feedback of questionnaires to MFRDMD.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 2		
Sub-activity 2.2: Consideration of possible solutions to the problems	MFRDMD will continue to promote through consultation with AMSs the implementation of the "ASEAN guidelines for preventing the entry of fish and fishery products from IUU fishing activities into the supply chain". The	21,100

Proposed Activity	Description of Proposed Activity	Proposed Budget
	implementation of the ASEAN Guidelines in each AMSs will be assessed.	
Activity 3		
Sub-activity 3.1: Establishment and dissemination of a catch documentation scheme for ASEAN countries	MFRDMD in collaboration with SEAFDEC/ Secretariat will establish, implement and assess the eACDS through meeting and discussion with the relevant stakeholders and government officials in the Brunei Darussalam and Malaysia.	8,796

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 2	
Sub-activity 2.2: Consideration of possible solutions to the problems	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 each AMSs.
Activity 3	
Sub-activity 3.1: Establishment and dissemination of a catch documentation scheme for ASEAN countries	Establish and implement the eACDS in Brunei Darussalam. Sharing with Malaysia lessons learned during establishment and implementation of the eACDS in Brunei Darussalam.

## 3. Schedule of Activity for the Year 2018

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 2												
Sub-activity 2.2:												
Activity 3												
Sub-activity 3.1												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			Project id: 201601009
<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>Program Thrust:</b>	III	<b>Total Duration:</b>	2016-2020
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Philippines
<b>Donor/Sponsor:</b>	Global Environment Facility	<b>Total Donor Budget:</b>	USD 3,000,000
<b>Project Partner:</b>	United Nations Environment Programme	<b>Budget for 2017:</b>	USD 692,500
<b>Project Leader:</b>	Christopher Paterson	<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 centre 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 Programme 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 intergovernmentally 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, Outcomes, Outputs, Indicators and Activities

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

Objective	Outcomes	Outputs	Activities
Objective 1: 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	Outcome 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	Output 1: Adopted management plans	Activity 1: Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea

Objective	Outcomes	Outputs	Activities
<p>Objective 2: 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>	<p>Outcome 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>Output 2: Endorsed policies and plans Regular reports of meetings of national and regional project management bodies Reports of independent mid-term and terminal project evaluations</p>	<p>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</p>
<p>Objective 3: 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>	<p>Outcome 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>Output 3: Routine communications on progress and lessons learned prepared and shared Annual results reports published and disseminated National and regional web portals for knowledge management and information exchange accessible online</p>	<p>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</p>
<p>Objective 4: Cost-effective and efficient coordination of national and regional level cooperation for integrated fisheries and environmental management</p>	<p>Outcome 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</p>	<p>Output 4: Regular reports of meetings of national and regional project management bodies Reports of independent mid-term and terminal project evaluations</p>	<p>Activity 4: National cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea</p>

### 3.2 Overall Scope/Description of Project

Activity	Description
<p>Activity 1. Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea</p>	<p>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.</p>
<p>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</p>	<p>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, 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.</p>
<p>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</p>	<p>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>.</p>
<p>Activity 4 National cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea</p>	<p>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>.</p>

### 3.3 Activity, Sub-activity and Proposed Budget for 2017-2020

(Unit: USD)

Activity	Sub-Activity	Y1 2017	Y2 2018	Y3 2019	Y4 2020
Activity 1:	Sub-activity 1.1 Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea	230,100	174,100	194,800	155,900
Activity 2:	Sub-activity 2.1: 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	129,000	299,000	247,000	71,000
Activity 3	Sub-activity 3.1: Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea	50,400	88,400	100,900	59,900
Activity 4	Sub-activity 4.1: National cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea	283,000	312,500	272,500	331,500
	<b>Sub-Total Budget</b>	<b>692,500</b>	<b>874,000</b>	<b>815,200</b>	<b>618,300</b>

## PART II: ACHIEVEMENT OF 2017 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 1

- Initiation of fisheries and coastal habitat information and data collection programmes for 8/14 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 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 8 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 modelling system linking oceanographic, biochemical, and fish early life history information to improve regional understanding of fish early life history and links to critical habitats have been prepared and discussed with regional universities, and Internationally recognized institutions with expertise in this field

#### Activity 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 December 2017.

#### Activity 4

- 8/14 sites have progressed agreement on detailed terms of reference for site-based management boards

### 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	P,R	170	21		219,560
Activity 2					
Sub-activity 2.1	P				98,000
Activity 3					
Sub-activity 3.1	I				20,156
Activity 4					
Sub-activity 4.1	R				65,000

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

Planned activity	Expected outcome/output	Achievements
Activity 1.		
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 UNEP 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 programmes for at 8/14 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</p>

Planned activity	Expected outcome/output	Achievements
		<p>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>
Activity 2		
Sub-activity 2.1	<p>Published national reviews &amp; 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</p>	<p>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 2018-2019 to be truly bottom-up.</p> <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 2018-2019 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</p>

Planned activity	Expected outcome/output	Achievements
		<p>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 modelling system linking oceanographic, biochemical, and fish early life history information to improve regional understanding of fish early life history and links to critical habitats have been prepared and discussed with regional universities, and Internationally recognized institutions with expertise in this field. The latter include NOAA, GRID-ARENDAL, and IOC/UNESCO. Expressions of Interest for the conduct of this work will be called for in the first quarter of 2018, and will be guided by the regional scientific working group of the project.</p>
Activity 3		
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 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 November-December 2017.
Activity 4		
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)	8/14 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 donors such as the European Union.

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

List of completed publications for the year 2016	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	

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1	NA
Activity 2	
Sub-activity 2.1	NA
Activity 3	
Sub-activity 3.1	NA
Activity 4	
Sub-activity 4.1	NA

#### 6. Major Impacts/Issues

- 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.
- 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 to discuss appropriate, corrective course of action that reflects present realities of demands on agencies particularly in response to IUU issue.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)		
Proposed Activity	Description of Proposed Activity	Proposed Budget
<b>Activity 1</b>		
Sub-activity 1.1	Identification and management of fisheries and critical habitat linkages at priority fisheries <i>refugia</i> in the South China Sea	174,100

Proposed Activity	Description of Proposed Activity	Proposed Budget
<b>Activity 2</b>		
Sub-activity 2.1	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	299,000
<b>Activity 3</b>		
Sub-activity 3.1	Information Management and Dissemination in support of national and regional-level implementation of the fisheries <i>refugia</i> concept in the South China Sea	88,400
<b>Activity 4</b>		
Sub-activity 4.1	National cooperation and coordination for integrated fish stock and critical habitat management in the South China Sea	312,500

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
Sub-activity 1.1	Fisheries <i>refugia</i> profile reports, including GIS maps and site characterisations, published for 14 priority sites
Activity 2	
Sub-activity 2.1	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-activity 3.1	Awareness materials published online, and online national web portals on fisheries <i>refugia</i>
Activity 4	
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)

## 3. Schedule of Activity for the Year 2018

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												
Activity 4												
Sub-activity 4.1												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			Project id: 201301007
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	Since 2004
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	All AMSs
<b>Donor/Sponsor:</b>	Host Countries of the Survey	<b>Total Donor Budget:</b>	None
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	None
<b>Project Leader:</b>	Isara Chanrachkij	<b>Involved Country:</b>	SEAFDEC Member Counties

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

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

To fulfill the needs of the Member Countries, region, sub-regional initiatives on research survey for fisheries resources stock status in their specific areas, the outputs from the survey include cruise report of the survey, technical documents related to fisheries resource stock status, and other specific requirements. It is expected that the results from the survey could facilitate the establishment and implementation of comprehensive policy for sustainable management and development of capture fisheries.

To accomplish key activities as mentioned above, TD works in close collaboration with the Member Countries and other key partners at national, sub-regional, and regional levels. M.V. SEAFDEC 2 focuses on three major specific areas: (i) fisheries resources research survey; (ii) oceanographic and marine environmental survey; and (iii) onboard navigation and marine engineering training. Over the years, the M.V. SEAFDEC 2 has been used for the survey of the fisheries resources in EEZ of the Member Countries. The vessel will also be used to implement the training programs.

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

In 2002, the Government of Japan approved the construction of a new fishery research and training vessel namely "M.V. SEAFDEC 2" along with procurement of the requisite fishing gear, fishing machinery, and survey equipment with the main purposes to conduct fishery resource and oceanographic research surveys and shipboard training on such topic in ASEAN Countries. Subsequently, the construction of a research vessel, M.V. SEAFDEC 2, was completed in 2003. Since 2004, research survey on fisheries resource exploration and sea trial on sampling gears, fishery oceanography, and other activities related to marine capture fisheries were conducted by M.V. SEAFDEC 2 in collaboration with SEAFDEC Member Countries. In a broader sense, the achievement of M.V. SEAFDEC 2 includes strengthen technical cooperation for effective fisheries and environmental management in the ASEAN region through the enhancement of research capability.

Due to increased operational cost for using M.V. SEAFDEC 2 that mainly caused by increased fuel price, the 40th Meeting of SEAFDEC Council (2009) agreed that the country that request to use M.V. SEAFDEC 2 should be responsible for the cost incurred by the vessel. Since 2010, the modified cost-sharing policy was therefore applied that fuel consumption of the vessel for the entire duration of the research/survey including cursing to and back to the requesting country will be responsible by the requested country (s).

At the 45th Meeting of the Council of SEAFDEC (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.

### 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: Fishery Resources Research Survey in Southeast Asia Waters	Output 1: A set of scientific data <i>i.e.</i> Hydro-Acoustic Data, Fisheries Resource, Oceanographic Data and the Phytoplankton, Zooplankton, Fish Larvae from the cruise survey	Activity 1: M.V. SEAFDEC 2 No.54-1/2017 Cruise Survey on small pelagic fish resources in Viet Nam Marine Water (16 June - 23 August 2017: 69 Days)
Objective 2: Assist Member Countries to build human resources capacity by using M.V. SEAFDEC 2	Outcome 2:	Output 2: 1. Competent researcher in the marine fisheries resources research survey	Activity 2.1: Human resources development through the shipboard survey for Vietnamese Researcher in M.V. SEAFDEC 2 No.54-1/2017 Cruise Survey on small pelagic fish resources in Viet Nam Marine Water (16 June - 23 August 2017: 69 Days)
		2. Competent personnel work as observer onboard fishing vessel	Activity 2.2: National Training course On the Observer Onboard Training Program of Thailand (11-15 September 2017)
		3. Ship staffs of SEAFDEC Training Department (Navigator and Engineer)	Activity 2.3: Follow up Program for Project for Construction of a fisheries research and Training Vessel

#### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 M.V. SEAFDEC 2 No.54-1/2017 Cruise Survey on small pelagic fish resources in Viet Nam Marine Water (16 June - 23 August 2017: 69 Days)	Department of Fisheries Viet Nam has proposed the utilization of M.V. SEAFDEC 2 for a national survey of small pelagic fish resources in marine Waters of Viet Nam during June to August 2017. Main contents of the survey cruise included 1) Hydro-acoustic survey in the marine waters of Viet Nam; 2) Sampling of the small pelagic fishes by mid-water trawl and bottom trawl at the survey stations and along the survey tracks; 3) Data collection on oceanographic data <i>i.e.</i> wind, wave, water temperature, salinity, turbidity, chlorophyll-a, current, etc. at survey stations 4) Biological sampling of the phytoplankton, zooplankton, fish larvae at survey stations.
Activity 2 Sub-activity 2.1 Human resources development through the shipboard survey for Vietnamese Researcher in M.V. SEAFDEC2 No.54-1/2017 Cruise Survey on small pelagic fish resources in Viet Nam Marine Water (16 June - 23 August 2017: 69 Days)	During the cruise survey on small pelagic fish resources in Viet Nam Marine Waters, Vietnamese researcher has gain knowledge and experience on the marine fisheries resources survey in particular the knowledge on shipboard survey management, bottom trawl and mid-water trawl fishing techniques, and oceanographic instrument.
Sub-activity 2.2 National Training Course on the Observer Onboard Training Program of Thailand (11-15 September 2017)	

Activity	Description
Sub-activity 2.3 Follow up Program for Project for Construction of a fisheries research and Training Vessel	Follow up Program for Project for Construction of a fisheries research and Training Vessel is a program to improve capacity of M.V. SEAFDEC 2 after her service at SEAFDEC for 13 years. SEAFDEC navigators and engineers gained their knowledge on new instruments both navigation aids and engine overall maintenance. Hence, the program enhances 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 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018
Activity 1	Sub-activity 1.1:						
Activity 2	Sub-activity 2.1:			Cost Sharing Policy			
	Sub-activity 2.2:						
	Sub-activity 2.3:						
Activity 3	Sub-activity 3.1:						
	Sub-Total Budget						

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

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

The collaborative survey cruise will be conducted by using M.V. SEAFDEC 2 during 16 June - 23 August 2017 (69 Days), within Viet Nam Waters. Major contents of the survey cruise are included:

- 1) Hydro-acoustic survey in the marine waters of Viet Nam;
- 2) Sampling of the small pelagic fishes by mid-water trawl and bottom trawl at the survey station and along the survey tracks, totally trawl 115 stations, includes 80 stations for bottom trawl, and 35 stations for mid-water trawl;
- 3) Sampling of hydrographic/oceanographic data, including: wind, wave, water temperature, salinity, turbidity, chlorophyll-a, current, etc. at survey stations;
- 4) Sampling of the phytoplankton, zooplankton, fish larvae at survey stations

During the cruise survey on small pelagic fish resources in Viet Nam Marine Water Vietnamese researcher had carried out on the job training and gain knowledge and experience on the marine fisheries resources survey in particular the knowledge on shipboard survey management, bottom trawl and mid-water trawl fishing techniques, and oceanographic instrument.

### 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	I	16			
Activity 2					
Sub-activity 2.1:	II	11			
Sub-activity 2.2:	II	30			
Sub-activity 2.3:	II		20		

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

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.1	Complete sampling survey stations	1. Conduct the hydro-acoustic survey in the marine waters of Viet Nam. Distance of the survey approximately 4,000 Nm; 2. Sampling of the small pelagic fishes by mid-water trawl and bottom trawl will be conducted at the survey station and along the survey tracks. There are totally 115 stations, includes 80 stations for bottom trawl, and 35 stations for midwater trawl (to be decided by the chief scientist of RIMF, with agreement by Chief scientist of SEAFDEC and Master of SEAFDEC2, during the survey); 3. There are 120 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 Vietnamese Researchers on the marine fisheries resources survey	During the survey on the M.V. SEAFDEC 2 Cruise No.54-1/2017 Survey on small pelagic fish resources in Viet Nam Marine Water (16 June - 23 August 2017) Vietnamese researcher gained knowledge and experience on the marine fisheries resources survey in particular the knowledge on shipboard survey management, bottom trawl and mid-water trawl fishing techniques, and oceanographic instrument.
Sub-activity 2.2:	30 graduated observer onboard fishing vessel	Department of Fisheries Thailand requested technical support
Sub-activity 2.3:	Competent SEAFDEC navigators and engineers in the improvement of M.V. SEAFDEC 2	1) navigators of M.V. SEAFDEC 2 understand and be able to operate the new instrument e.g. navigation equipment, communication equipment on board M.V. SEAFDEC 2 2) Engineers of M.V. SEAFDEC 2 get knowledge and experience on engine maintenance of main engine and auxiliary engine and deck machineries.

### 4. List of Completed Publications and Others

List of completed publications for the year 2016	Type of media	Attached e-file
1. Summary Report of the Cruise Arrangement on the M.V. SEAFDEC 2 No.54-1/2017 Cruise Survey on small pelagic fish resources in Viet Nam Marine Water	Hard copy	
2. Draft Cruise report on M.V. SEAFDEC 2 No.54-1/2017 Cruise Survey on small pelagic fish resources in Viet Nam Marine Water (16 June - 23 August 2017: 69 Days)	Hard copy	
3. Cruise report on the Observer onboard program	Hard copy	

## 5. Major Impacts/Issues

The survey has constraint with the weather condition (Tropical typhoon) in Viet Nam Waters. In some survey area, fishing ground is dangerous for trawling result the trawl nets were broken. Number of trawl prepared for survey was not enough.

Midwater trawling without depth sensor made operation not fully success. Hybrids otter board, can be used in bottom trawl and mid-water trawl, is more suitable for the survey in Viet Nam Waters.

M.V. SEAFDEC 2 will be improved for more safety and reliable for cruise survey however some scientific and survey equipment *e.g.* Scanmar Trawl-eye®, Depth sensor, and etc., need to be improved. Budget is the significant constraint to improve or renew these instrument.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1	Improvement of M.V. SEAFDEC 2: Since M.V. SEAFDEC 2 grant aid by Japanese government in year 2004, M.V. SEAFDEC has been utilized to strengthen technical cooperation in Southeast Asian Region through research and training activities. In order to smoothly and safety support to Member Countries Japanese Government kindly consider to support budget through Japan International Cooperation Agency (JICA) on recondition vessel, life span extension and safety improvement.	*
Activity 2	Assist Member Countries to conduct National survey on marine fisheries research resources survey of SEAFDEC Member Countries	
Activity 3	Assist Member Countries to build human resources capacity by using M.V. SEAFDEC 2	*

\* Cost sharing scheme

#### 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	Repair and recondition of deck machineries, main engine with monitoring sensor, navigation aid and radio, fishing electronic devices and refrigeration system
Activity 2	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 3	Competent fisheries researcher and oceanographer to handle the fisheries research resources shipboard survey

#### 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 No.2 and 3 has been identified after consultation with MCs

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

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>Program Thrust:</b>	IV	<b>Total Duration:</b>	2014 - 2019
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	Viet Nam
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 640,304
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD 429,504
<b>Project Leader:</b>	Ms. Siriporn Pangsorn	<b>Involved Country:</b>	SEAFDEC Member Counties

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

Currently, attempts of countries in the Southeast Asia have initiated to expand their fishing activities in the offshore areas in their respective EEZ where fisheries resources are still under-utilized as for the alternative fisheries resources. Over the years, SEAFDEC/TD has also initiated and provided technical supports to the Member Countries on the exploration of fishery resources in their EEZ through various programs of activities. During the past few years, TD organized a number of technical meetings, workshops and trainings related to fisheries resource exploration. The outputs from such activities could be referred to as references to facilitate development of the offshore fishery resources in the EEZ of the Member Countries.

Main activities under this project include training activities and technical supports from TD on offshore fisheries resources exploration in EEZ of the Member Countries through human resources capacity building programs including sea trial, and cruise survey of the Member Countries using M.V. SEAFDEC 2 and other research vessels. 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.

### 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 including offshore areas in their respective EEZ waters.

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.

Concerning on the issues on delay of data analysis on tuna research work as well as the preparation on development of the Project concern on fish handling at sea, SEAFDEC proposes to extend the project period to 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: 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 1: Organize the regional training course on improvement of post-harvest fish handling at sea
Objective 3: Strengthening quality research survey on offshore fisheries resources, and promote value addition to marine fisheries products in Southeast Asian Region	Outcome 3: Efficiency of research survey on offshore fisheries resources and appropriate improvement of post-harvest fish handling	Output 3: Sampling gear used for fisheries resources survey and/or Promote the materials of the improve Fisheries Research Resource Exploration and package(s) of technical handbooks and training reports on improvement of post-harvest fish handling	Activity 1: 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 will be presented in 2017.
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
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	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 conduct the compilation and revision of the technical handbook or guideline of SOP on sampling gears and survey methodology for offshore fisheries resources exploration. These publication will be disseminated both by documents and website

### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2017

(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	
	Sub-activity 1.2 Study on the stock structure of tuna in Sulu and Sulawesi Seas.						20,409	

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
	Sub-activity 1.3 Training course on the Productivity and Susceptibility Analysis to identify to Determine Stock Vulnerability in Southeast Asia Waters in November 2017)						15,000	
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  2.2 Marine fisheries resources research survey in the Gulf of Thailand					2,000	3,000	2,000
							300,000	
Activity 3: Technical Support to SEAFDEC staff(s) for participate the Cruise Survey and the meetings/ workshop/ symposium			4,000	4,000	5,000	5,000	5,000	5,000
Activity 4: Improvement Program of the Fish Handling at Sea	Sub-activity 4.1 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		45,900	15,900	16,000	15,000	18,595	20,000
	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	1) Modified semi-pelagic and mid-water trawl net for small pelagic fisheries research resources survey 2) Set of technical documents of Joint Program on Tuna Research in Sulu and Sulawesi Seas		4,000	4,000	5,000	4,000	20,000  2,500	20,000
<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>47,000</b>

## PART II: ACHIEVEMENT OF 2017 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.

In the year 2015, Working Groups Meeting and Technical Meeting on Joint Program on Tuna Research in Sulu and Sulawesi Seas from 10 to 11 February 2015, at Secretariat office of SEAFDEC, Bangkok, Thailand, was organized in collaboration between project implementing partners, *i.e.* SEAFDEC/SEC, MFRDMD, TD, and Participating Countries. Results of meeting are the progress report of survey activities implemented by the IMP-Countries on data collected at the selected landing sites. Historical data of tuna landing has reported to Tuna stock assessment expert, Dr. Tsutomu Nishida. He also provided suggestion to prepare further historical data and initiate the communication with stock assessment working.

In order to follow up the agreement of Working Groups Meeting and Technical Meeting on Joint Program on Tuna Research in Sulu and Sulawesi Seas conducted from 10-11 February 2015, SEAFDEC in collaboration IMP-Countries convened had organized the Second Working Groups Meeting Joint Program on Tuna Research in Sulu and Sulawesi Seas at Davao City, the Philippines, from 25 to 27 August 2015.

The outputs of meeting are progress of project implementation on the study of Stock assessment; tuna spawning ground; tuna genetic; and Fish Aggregating Devices (FADs). Drafted technical document of tuna stock assessment by using historical data in Sulu and Sulawesi Seas were presented by Dr. Tsutomu Nishida. SEAFDEC/TD presented cruise report of M.V. SEAFDEC 2 on the second joint research survey on tuna research in Sulu and Sulawesi Seas. Meeting finalized the possible future activities for implementation of Joint Program on Tuna Research in Sulu and Sulawesi Seas. Follow up activities is the Report to the PCM (Program Committee Meeting) on Nov.23-25, 2015 in Manila, the Philippines and Council Meeting, April 2016, Viet Nam. Meeting also agrees to convene the Writeshop to summarize research studies, tentatively in August 2016 at Indonesia. However with the delay on progress of data analysis *i.e.* nutrient, DNA, larvae identification and fisheries resources abundance by using scientific echo sounder. The write-shop will be delay to 2018.

In order to update the progress of activities, The Working Groups Meeting to Follow-up Activities on Joint Program on Tuna Research in Sulu and Sulawesi Seas was held on March 2017. The output from the Meeting was the update progress of the tuna research work in each topic, direction and solution of the difficulties on data analysis to support the tuna research in SSSs, and the future activities during 2017-2019 was discussed during the meeting. A set of technical report on the tuna research in SSSs will be published by the end of 2017.

Project has supported the human resource development on the fisheries resources survey in Southeast Asia Waters. SEAFDEC in collaboration with Member Countries, fisheries agencies, universities and institutes will conduct the fisheries Joint Research and Training Cruise in the Southeast Asia Waters for 2017 by SEAFDEC research/training vessel and/or National research/training vessel. Researchers from SEAFDEC MCs and SEAFDEC/TD researchers will be supported to participate in cruise survey.

For the activity on supporting SEAFDEC technical staffs to conduct the consultation visit entitled “The Technical Meeting on the Utilization of M.V. SEAFDEC2 for Cruise Survey on Small Pelagic Fish Resources in Marine Waters of Viet Nam” for planning of offshore fisheries resources research survey in Vietnamese Waters by using of M.V. SEAFDEC2 on 3<sup>rd</sup> to 5<sup>th</sup> May 2017 in Viet Nam. The meeting was discussed and prepared on the details of cruise plan, administrative and financial matter.

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 is 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 will participate on this survey. After the cruise survey, a report on the survey will be prepared and submitted and a presentation on the survey will be done in March 2018.

Referring to the Collaborative Research between Cambodia, the National Fisheries University (NFU), Japan and SEAFDEC/TD in the Cambodian waters from 7-18 November 2016 sampling collection in Cambodian Waters for study about marine biology, the fish larvae research is the part of this survey. In order to enhance capacity of Fisheries Administration (FiA) Cambodian’s researchers in larval fish identification skill and to success in ichthyoplankton study in Cambodia country, the technical assistance on fish larvae identification is necessary. Therefore, two potential researchers of FiA Cambodia who was trained on fish larvae identification were invited to SEAFDEC/TD laboratory from 1-31 August 2017. Both of them identified fish larvae by themselves under supervising and technical support from SEAFDEC researcher and resources person on fish larvae. The output of this capacity building was information and document of fish larvae in Cambodian Waters and capability of FiA Cambodia researchers to identify fish larvae up to family or genus level. The report on Density of fish larvae in Cambodian Waters was finished in the end of September 2018.

In parallel with the promotion on sustainable resources utilization, JTF has being supported the responsible practices on fish handling technology at sea since 2013. The Regional Training Course on Fish Handling Techniques Applicable to Various Fishing Operations in Southeast Asia organized by Training Department of SEAFDEC, from 13-17 November 2017, at Samut Prakan, Thailand. Regional training course has extended 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.

The collaborative survey cruise will be conducted by using M.V. SEAFDEC 2 during 16 June - 23 August 2017 (69 Days), within Viet Nam Waters. Major contents of the survey cruise are included;

- 1) Hydro-acoustic survey in the marine waters of Viet Nam;
- 2) Sampling of the small pelagic fishes by mid-water trawl and bottom trawl at the survey station and along the survey tracks, totally trawl 115 stations, includes 80 stations for bottom trawl, and 35 stations for mid-water trawl;
- 3) Sampling of hydrographic/oceanographic data, including: wind, wave, water temperature, salinity, turbidity, chlorophyll-a, current, etc. at survey stations;
- 4) Sampling of the phytoplankton, zooplankton, fish larvae at survey stations

During the cruise survey on small pelagic fish resources in Viet Nam Marine Water Vietnamese researcher had carried out on the job training and gain knowledge and experience on the marine fisheries resources survey in particular the knowledge on shipboard survey management, bottom trawl and mid-water trawl fishing techniques, and oceanographic instrument.

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

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	V: Collaborative program	9	14		12,807 (Budget of year 2016)
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	V: Collaborative program	6	5		2,264
Activity 3 1. Technical Support of SEAFDEC staff(s) to Cambodia FiA staffs conduct larvae identification 2. Support SEAFDEC staff to participate the offshore fisheries resources research survey in Antarctic Ocean by T/V Umitaka of Tokyo University of Marine Science and Technology 3. Support SEAFDEC staff to participate IOTC Data Limit Model at Seychelles in November 2017	II	2	2		6,334 (Fish Larvae Identification)  2,800 (T/V Umitaka Maru)  5,000
Activity 4 Organize the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea	IV	20	5		17,000 (Approximate)
Activity 5 Modification of the offshore sampling gears and technical project publications					4,000

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

Planned activity	Expected outcome/output	Achievements
Activity 1 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	1) Updated research activities 2) Drafted the Final project report on the tuna fisheries resources survey in Sulu and Sulawesi Sea 3) Agreed future activities of joint research program on tuna research in SSSs	1) Scientific coordination between countries around Sulu Sulawesi Seas (SSSs) 2) Support the tuna management plan in SSSs 3) Plan of the Joint Program on Tuna Research in Sulu and Sulawesi Seas in the year 2017-2019
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	1) 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 2) Tentative Cruise Order of	1) Agree cruise plan M.V. SEAFDEC 2 in year 2017 with SEAFDEC Member Countries under the cost sharing scheme

Planned activity	Expected outcome/output	Achievements
	M.V. SEAFDEC 2 survey around Waters in Southeast Asia	
Activity 3 Technical Support of SEAFDEC staff(s) to the Cruise Survey and the meetings/workshop/symposium	1) FiA Cambodia researchers enhance their skill on fish larvae identification 2) SEAFDEC/TD staffs participated with cruise survey	1) Two (2) FiA Cambodia researchers participated in capacity building on fish larvae identification 2) One (1) SEAFDEC/TD staff participated with cruise survey onboard T/V Umitaka-Maru
Activity 4 Organize the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea	1) 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	1) Participants enhance knowledge and practical skills on reduction of post-harvest losses 2) Strategies/ways forward to improve fish handling in assigned coastal and offshore fisheries cases in Southeast Asia
Activity 5 Modification of the offshore sampling gears and technical project publications	3) Modified semi-pelagic and mid-water trawl net for small pelagic fisheries research resources survey 4) Set of technical documents of Joint Program on Tuna Research in Sulu and Sulawesi Seas	1) Semi-pelagic and mid-water trawl net 2) Scientific Report entitles Stock Assessments of yellowfin tuna ( <i>Thunnus albacares</i> ), bigeye tuna ( <i>Thunnus obesus</i> ) and skipjack tuna ( <i>Katsuwonus pelamis</i> ) in Sulu and Sulawesi Seas by ASPIC Model 3) Technical Report on the Distribution of Fish aggregating devices (FADs) around SSSs 4) Survey Report on Fisheries Resources Abundance around SSSs by Using Hydroacoustic Equipment 5) Technical Report on Tuna spawning ground in SSSs 6) A set of SOPs for assessing the status of tuna resources in region or sub-region waters in Southeast Asia

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

List of completed publications for the year 2017	Type of media	Attached e-file
1. Scientific Report entitles Stock Assessments of yellowfin tuna ( <i>Thunnus albacares</i> ), bigeye tuna ( <i>Thunnus obesus</i> ) and skipjack tuna ( <i>Katsuwonus pelamis</i> ) in Sulu and Sulawesi Seas by ASPIC Model	Hard copy	
2. Technical Report on the Distribution of Fish aggregating devices (FADs) around SSSs	Hard copy	
3. Survey Report on Fisheries Resources Abundance around SSSs by Using Hydroacoustic Equipment	Hard copy	
4. Technical Report on Tuna spawning ground in SSSs	Hard copy	
5. 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	Due to the delay of data analysis, Writeshop will be postponed to early of January 2018. IMP countries agreed on future activities for the year 2018-2019
Activity 2	Successful for technical consultation with Viet Nam to plan the cruise survey in Viet Nam waters

Planned activity	Evaluation/ Views from Participants
Activity 3	FiA Cambodia researchers enhanced their skill on fish larvae identification. They gain knowledge and experience on this field which can be useful for their own work in the future.
Activity 4	Overall subjects of training course is good contents 1. Participants were satisfied with class session and field trip 2. Training facilities and accommodation is good
Activity 5	Trainee of training course and participant of meeting express 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 sharing among the countries are needed in the future for strengthening cooperation among the countries concerned as well as to build the capacity of human resources for assessment of status of such important species.

The project has issues on the delay of analysis of samples both water samples, juvenile/larvae, tuna genetic. Oceanographic data on the nutrient analysis is delayed regarding to the malfunction of Auto Analyzer. Training Department as Coordinator needs to strengthened following up the progress of each topic of research in SSSs.

Regional training course on fish handling technique, applicable to various fishing operation in Southeast Asia has a language barrier among the participants. Some participants requested for more practical session and field trips (few vessels). They also requested to have more flexible schedule. 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.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2018

### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1 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.	15,000
1.2 Study on the stock structure of tuna in Sulu and Sulawesi Seas.	Project will conduct the 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).	20,409
	Training course on the Productivity and Susceptibility Analysis to identify to Determine Stock Vulnerability in Southeast Asia Waters in November 2017	15,000
Activity 2 2.1 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 2018.	3,000

Proposed Activity	Description of Proposed Activity	Proposed Budget
2.2 Marine fisheries resources research survey in the Gulf of Thailand	With reference to the result of the Survey in the Gulf of Thailand in year 2013, SEAFDEC/TD will conduct the marine resources and environmental survey in the Gulf of Thailand. SEAFDEC/TD will be coordinator and formulate the project proposal for marine resources and environmental survey together with human resources capacity building program. The area is covered around the Gulf of Thailand in the area of Thai, Cambodia and Viet Nam Waters.	300,000
Activity 3 3.1) Technical Support of SEAFDEC staff(s) to the Cruise Survey or meetings/ workshop/symposium	Supporting technical staff(s) of SEAFDEC/TD to participate the cruise survey and technical meetings of sub-regional study/research on offshore fisheries resources survey. Plan of the marine fisheries resource survey by M.V. SEAFDEC 2 in Member Countries Waters possible to conduct in the year 2018.	5,000
Activity 4 4.1 Organize the 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. (15,000 USD) Activity is planning in the last quarter of 2018.  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.	18,595
4.2 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 will be implemented at selected pilot sites along the country (Northern, Central, and Southern of Viet Nam). The exactly pilot sites will be discussed with DOF of Viet Nam.	30,000
Activity 5 5.1 Technical project publications	In order to promote the results on the Joint Program on Tuna Research in Sulu and Sulawesi Seas, Set of technical research reports will be published and disseminated through the project website.  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 and during Regional activities (Training/Workshop/Meeting) on the improvement of the fish handling at sea in August 2018.	2,500
5.2 Modification of the offshore sampling gears	In order to strengthen quality research survey on offshore fisheries resources, Sampling gears, <i>i.e.</i> Semi-pelagic and Mid-water trawl net and otter board will be redesigned and modified using with cruise survey of M.V.SEAFDEC2 for research survey in Viet Nam Waters, during the year 2018.	20,000

\* Cost sharing scheme

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

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. Final report on the results on the Joint Program on Tuna Research in Sulu and Sulawesi Seas (Priority 1)</li> <li>2. Series of Skipjack Otolith collection in the pilot site of SSSs Member Countries</li> <li>3. Technical papers on Tuna Stock Assessment for YFT, BET and SKJ resources in SSSs by using GLM CPUE standardization, ASPIC, and Kobe Plot</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. SEAFDEC2 or other national research vessels	<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. Technical staffs of TD participate the international symposium to promote result of project Offshore Fisheries Resources Exploration in Southeast Asia</li> <li>3. Update status of fisheries resources and marine environment in the Gulf of Thailand</li> <li>4. Status of current marine resources and environmental in the Gulf of Thailand</li> <li>5. Identify change of the marine resources and environmental parameter in the Gulf of Thailand</li> <li>6. Capacity building for junior researcher and university students on marine resources and environmental survey</li> </ol>
Activity 3 Technical Support of SEAFDEC staff(s) to the Cruise Survey and the meetings/workshop/symposium	<ol style="list-style-type: none"> <li>1. Technical staffs of TD and Member Countries join the cruise survey, e.g. M.V. SEAFDEC2, T.V. Koyo Maru, and Other National Research Vessel</li> <li>2. Technical staffs of TD participate the international symposium to promote result of project Offshore Fisheries Resources Exploration in Southeast Asia</li> </ol>
Activity 4 Organize the 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</li> <li>2. Organize 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. SEAFDEC2 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 YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

		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: Activity 1. Facilitating fisheries activity information gathering through introduction of Community-based Resources Management/Co-management		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2013-2019
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	Viet Nam
<b>Donor/Sponsor:</b>	Government of Japan	<b>Total Donor Budget:</b>	USD 371,416
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD 86,816
<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
<b>Objective 1:</b> Improve compilation of fisheries and socio-economic information on coastal small-scale and inland fisheries in the Southeast Asia.	<b>Outcome 1:</b> (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.	<b>Output 1:</b> Discussing and exchanging information/opinions and cultivating understanding on the way forward for promotion of fisheries information gathering.	<b>Activity 1:</b> Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region.
<b>Objective 2:</b> Support member countries to introduce applicable practice of CBRM/Co-management	<b>Outcome 2:</b> Increased the number of local officers and fishers who cultivate understanding on introducing skills for establishment of CBRM/Co-management.	<b>Output 2:</b> (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.	<b>Activity 2:</b> Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management, including the methodology on gathering fisheries activity information
<b>Objective 3:</b> Facilitate better understanding and knowledge on status and condition of coastal small-scale and inland fisheries at national and local level	<b>Outcome 3:</b> Fisheries management through CBRM/Co-management approach strengthened the information dissemination of results of practical models and survey for Member Country	<b>Output 3:</b> Discussion and Developing practical models of CBRM/Co-management of coastal small-scale and inland fisheries with Member Country	<b>Activity 3:</b> 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	Description
Activity 2. Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information	Training On Trainers (TOTs) courses are conducted in selected countries. The TOTs aim to 1) Provide clear and detailed concept and methodology on CBRM/Co-management; 2) Cultivation the understanding on tools for data and information collection in coastal and inland fishing communities; and 3) Introducing skills for establishment of organizations in the fishing communities to implement CBRM/Co-management. As well including practical planning and implementing the applicable coastal/inland fishery management plans.
Activity 3. Monitoring and facilitating 3.1 Monitoring and additional support for member countries activities of facilitating CBRM/Co-management and gathering fisheries activity information	Member Country will select pilot site which promoted CBRM/Co-management approach, and SEAFDEC will assist fisheries officers of Member Countries in collecting and analyzing information from fisheries community for policy formulation, also in designing coastal and inland fishery management plans through participatory mechanism of CBRM/Co-management approach, that suit the local condition.
3.2 Study (Base-line survey) on appropriate activities sustainable for CBRM/Co-management in fisheries community of Member Country	SEAFDEC assists Member Countries in promoting CBRM/Co-management and building the capacity of the fisheries community

### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2017

(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	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 3. Monitoring and facilitating	Sub-activity 3.1: Monitoring and additional support for member countries activities of facilitating CBRM/Co-management and gathering fisheries activity information				7,000		40,816	22,800
	Sub-activity 3.2: Study on appropriate activities sustainable for CBRM in fisheries community in Southeast Asia.			17,000	6,000	22,800	6,000	
	<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>42,800</b>

## PART II: ACHIEVEMENT OF 2017 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 particular situation. In 2017, the project conduct the follow-up activities at the pilot site in Cambodia and Thailand, the activity mainly focus on promote CBRM/Co-management in the fishing communities which is able to assist fisheries officers to introduce CBRM/Co-management, as well as in order to design coastal and inland fishery management plans under the appropriate participatory mechanism of co-management approach as well as the project pilot site in Lao PDR was initiated at Nam Souang Reservoir since March 2017. However, the activities on "Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region" will be organized in January 2018.

### 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 <i>*Activities of year 2017 will be organized in January 2018</i>	Seminar				* Activities of year 2017 will be organized in Jan 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			Activities has not in the implement plan of year 2017		

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
Activity 3. Monitoring and Evaluation 3.1 Monitoring and evaluation CBRM/Co-Management Project in Chong Khaneas, Siem Reap, Cambodia a) 7 - 9 Feb 2017	Research	12	3	1 (Japanese student of Tokyo University)	3,936
		24	6	-	6,504
3.2 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand a) 20 - 24 Feb 2017		90	9	1 (Japanese student of Tokyo University)	2,735
		90	4	-	2,321
3.3 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR a) 27 Feb –3 March 2017		53	4	1 (Japanese student of Tokyo University)	4,207
		37	4	-	4,661
		53	2	-	4,718

### 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 <i>*Activities of year 2017 will be organized in January 2018</i>	The resolution problem and constraints of promotion CBRM/Co-management from seminar and lesson learned will further apply among Member Countries	SEAFDEC Member Countries share the idea and experiences on the CBRM/Co-Management approach as well as problems/constraints (technical and non-technical problems) and way forward. Especially, project pilot site which promoted support by SEAFDEC's mechanism.
Activity 2. Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information	Activities has not in the implement plan of year 2017	Activities has not in the implement plan of year 2017
Activity 3. Monitoring and Evaluation 3.1 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 activity would promote conservation area in Fishing community, 24 fishers gained the knowledge on FRP boat construction for patrolling activity in the conservation area and could promote eco-tourism using for boat trip.
3.2 Monitoring and evaluation CBRM/Co-		80 fishers of 16 fisheries communities around Nam Oon Dam learned about

Planned activity	Expected outcome/output	Achievements
Management Project in Nam Oon Dam Sakon Nakhon, Thailand		CBRM/Co-management through the project activities especially they have awareness on fisheries management by themselves and management of conservation area that clearly define by installation of buoy providing by SEAFDEC. The 32 voluntary fishers participate in data collecting by recording their catch into logbook. Starting stock assessment research in Inland Fisheries to be Model for Member Countries.
3.3 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR		The fishing community of the pilot site has been strengthened by the establishment of Fisheries Management Committee (FMC) and the promotion of the fisheries management rule and regulation by Co-management approach between FMC and governor.

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

List of completed publications for the year 2017	Type of media	Attached e-file
1. Report on Monitoring and evaluation CBRM/Co-Management Project in Chong Khaneas, Siem Reap, Cambodia, 7-9 Feb 2017	Hard copy and PDF	
2. Report on Monitoring and evaluation CBRM/Co-Management Project in Chong Khaneas, Siem Reap, Cambodia, 15-20 May 2017	Hard copy and PDF	
3. Report on Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand, 20-24 Feb 2017	Hard copy and PDF	
4. Report on Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand, 26-30 June 2017	Hard copy and PDF	
5. Report on Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR, 27 Feb – 3 Mar 2017	Hard copy and PDF	
6. Report on Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR, 22-26 May 2017	Hard copy and PDF	
7. Report on Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR, 17-21 July 2017	Hard copy and PDF	

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

Planned activity	Evaluation/ Views from Participants
Activity 1. Regional Seminar on Improvement CBRM/Co-Management approach in Coastal small-scale and Inland Fisheries of the Southeast Asian Region <i>*Activities of year 2017 will be organized in January 2018</i>	-
Activity 3. Monitoring and Evaluation 3.1 Monitoring and evaluation CBRM/Co-Management Project in Chong Khaneas, Siem Reap, Cambodia	-
3.2 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand	-
3.3 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR	-

## 6. Major Impacts/Issues

1. One main activity of this project was implementing the project pilot site with SEAFDEC Member Countries to improved CBRM/Co-management approach by cost sharing, and project pilot site in Thailand was implemented by cost sharing and get award from government on Co-management project, and share lesson learn of this model to other site of Thailand. This challenge is good for our project, and Thailand need to continue the project in other site of Thailand.
2. Co-management project site in Siem Reap Province, Cambodia have smart management work plan, but no budget and knowledge to conduct the activities by their plan. Cambodia requested SEAFDEC to support more budget and technical.
3. The project pilot site have only site in Inland Fisheries, in Cambodia, Lao PDR, and Thailand. This year Viet Nam requested the project pilot site in coastal area, which good challenge for SEAFDEC.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2018

### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

		(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	Activities of year 2017 will be organized in January 2018 Resolution problems and constraints of promotion CBRM/Co-management in coastal small-scale and inland fisheries 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. The workshop is 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	The on-site training on introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information will provide to the fisheries officers to strengthen their knowledge on CBRM/Co-management for the Member Countries. The training course will have organized in the Member Countries requested for 30 fisheries officers.	20,000
Activity 3. Monitoring and Evaluation 3.1.1 Monitoring and evaluation CBRM/Co-Management Project in Chong Khneas, Siem Reap, Cambodia	The local meeting will organize to summarize the SEAFDEC project activity after implementation for 5 years and provide feedback to the local fisheries community after the regional seminar would be conducted in January 2018. The media document will consider producing to introduce CBRM/Co-Management project in Chong Khneas Commune and distribute to the other area of Cambodia (1trip)	4,000
3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR	The baseline survey will conduct to identify fish species composition in Nam Souang and preparation of fish conservation zone mapping, installation of buoys for demarcation fish conservation zone as well as the fish restocking program. These activities will promote the management of Conservation zone to the fishing community at Nam Souang Reservoir. In 2018, the mobile hatchery will introduce to the Community and implementation hatchery system and releasing juvenile fish.	12,000
3.1.3 Monitoring and facilitating the CBRM/Co-management the pilot site in Viet Nam	The new pilot site in Viet Nam (as request from the Council Meeting) will be established. The preparation work will conduct by contract and coordinate with Viet Nam for site selection and start the first activity on baseline survey and prepare work plan.(3 trips)	12,816
3.1.4 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province,	The project will establish Fisheries Management Committee (FMC) and enhance livelihood through strengthen the knowledge on Fish processing and fish culturing for member of Nam Prakan Village as the pilot site. In 2018, the activity will focus on the	12,000

Proposed Activity	Description of Proposed Activity	Proposed Budget
Lao PDR	implementation of fish processing product and statistic and marketing survey.	
3.2.1 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand	The monitoring activity will conduct at the pilot site, Nam Oon Dam, Sakon Nakhon Province to find and develop the appropriate fisheries management measure such as close season and promote to the fisher and fishing boat registration and provide fishing gear licensing in the fishing community. The research on stock assessment will start together with the data collection by volunteer fishers around Nam Oon Dam. (2 trips)	6,000

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

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	None of activities are implemented in year 2018
Activity 2. Strengthening training on site to introduce the appropriate participatory mechanism of CBRM including the methodology on gathering fisheries activity information	The fisheries officer of Central and Provincial of Member Countries gain knowledge on CBRM/Co-management through the on-site training course, this mechanism should assist directly through Local officer (Provincial officers of each Member Countries to better understand and further apply this knowledge for their work especially on create resource management plan in their provinces.
Activity 3. Monitoring and Evaluation 3.1.1 Monitoring and evaluation CBRM/Co-Management Project in Chong Khneas, Siem Reap, Cambodia	The lesson learn on CBRM/Co-management from Chong Khneas Commune will conclude and develop the media document to promote the CBRM/Co-management approach to the other area in Cambodia and Member Countries.
3.1.2 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR	The Fisheries Management Committee was established in the project site and strengthen on the fisheries rule and regulation and also the conservation area management. The fisheries resources would enhances through introduction mobile hatchery for fishing community which could be implemented by themselves.
3.1.3 Monitoring and facilitating the CBRM/Co-management the pilot site in Viet Nam	The pilot project site will be selected in the coastal area to promote the CBRM/Co-Management in Viet Nam. The local officers and fishers of Viet Nam will be better understanding the current fisheries situation from baseline survey and how to create the work plan.
3.1.4 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR	The project will establish Fisheries Management Committee (FMC) and enhance livelihood through strengthen the knowledge on Fish processing and fish culturing for member of Nam Prakan Village as the pilot site.
3.2.1 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand	The appropriate fisheries management measure will develop by fishers themselves and implement 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 develop and further publish. This pilot site will be the model of Co-management project in Inland Fisheries.

## 3. Schedule of Activity for the Year 2018

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												

<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>
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 3.2.1 Monitoring and evaluation CBRM/Co-Management Project in Chong Khaneas, Siem Reap, Cambodia													
3.2.2 Monitoring and evaluation CBRM/Co-Management Project in Nam Oon Dam Sakon Nakhon, Thailand													
3.2.3 Monitoring and facilitating the CBRM/Co-management the pilot site in Vientiane, Lao PDR													
3.2.4 Monitoring and facilitating the CBRM/Co-management the pilot site in Viet Nam													
3.2.5 Monitoring and facilitating the CBRM/Co-management the pilot site in Khammouane Province, Lao PDR													

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

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: Activity 2. Improving the Data Collection of the Commercially-exploited Aquatic and Threaten Species		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2004 -2019
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	Viet Nam
<b>Donor/Sponsor:</b>	Government of Japan	<b>Total Donor Budget:</b>	USD 281,900
<b>Project Partner:</b>	MFRDMD	<b>Budget for 2018:</b>	USD 64,200
<b>Project Leader:</b>	Mr. Sukchai Arnupapboon	<b>Involved Country:</b>	SEAFDEC Member Counties

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

Since the past decades, Sharks and Rays have become one of the valuable fishery resources and commodities of Southeast Asia Countries by contributing to the livelihood of fishers, traders and exporters. Recently, nine (9) species of shark and seven (7) species of rays have been listed under CITES-Appendix II after the 17th 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 some SEAFDEC Member Countries (MCs). In order to respond to this issues, SEAFDEC collaborates with SEAFDEC MCs has developed improving 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 NPOA-Sharks and rays and to provide scientific evident particularly stock assessment for sharks and rays fishery management sustainably.

### 2. Background and Justification

In 2013, the project activities focus on improvement of data and information collection for commercially exploited aquatic species of sharks. This is to follow-up the output from a series of events, including the technical meetings in Thailand in 2011 and 2012 organized by TD, and the regional training course on shark species identification organized by MFRDMD in early 2012. The outputs from these showed that information on shark stock status in Southeast Asian Countries was not yet reliable. Because of lack of information on stock structure, abundance, life history, and reproductive capacity, in general, species by species statistics of sharks is lacking in Southeast Asian Countries. Moreover, insufficient policy and financial support on research and management of sharks is common key issues in the region This project aims at continuing the support the Member Countries 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 is training to trainer, who is able to pass knowledge from workshops to their local shark landing operators. Shark data landing at pilot sites of the some SEAFDEC Member Countries was initiated in August 2014 under technical support by monitor from SEAFDEC 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 implemented from 2015 to 2016 in seven ASEAN Member States, namely: Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam. Sharks Data Collection in Southeast. Major output of 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, 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, 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 the building human resources capacity on shark identification into species level.

In year 2018, project will emphasize to organize training workshop on stock assessment of shark and rays. The aim of training is capacity building SEAFDEC MCs to be able to utilize data for fishery management. However, major regional problem of sharks and rays data at present is insufficient for proving that the model which was determined in year 2017 is fitting to assess shark and ray stock or not. Therefore, if possible, project will support data collection three more year from 2018-2020 at two landing sites, one site for pelagic species and another for demersal species. Additionally, in order to support Member Countries that NPOA-Shark has not yet formulated, project will facilitate the planning process for drafting the NPOA-Shark within 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 human resource capacity in Sharks and Rays identification in the national level	Outcome 1: National data collection system on landing sharks and rays.	Output 1: Human resources on Sharks and Rays identification and data collection	Activity 1: Human Resource Development
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 base on 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: Sub-activity 2.1: Support SEAFDEC Member Countries to implement shark data collection at landing site(s) 1. Sharks and rays data collection in Southeast Countries 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)	a) Appropriate method to utilize data to examine shark and ray resource status	Sub-activity 2.2: Improve quality of data collection to support fisheries management

Objective	Outcomes	Outputs	Activities
	for investigate stock assessment of Sharks and Rays)	and fishery status based on ASEAN's existing data b) Regional network on sharks and rays identification and stock assessment	( Determining and Training Workshop on appropriate model for assessing resource and fishery status of sharks and rays)
Objective 3: 3.1) To provide the national and regional reference 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 to 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 request by 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) 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

Activity	Description
Activity 1: Human resource development programs through the project of improvement of sharks data collection in Southeast Asia	Since year 2011, 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/ MFRDMD and SEAFDEC/TD in order to improve human resource capacity in data collection and identification in the species level. SEAFDEC will organize both regional and national training program for fisheries researcher of SEAFDEC MCs.
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 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 (Training Workshop on Appropriate Model for Assessing Resource and Fishery Status of Sharks and Rays)	In year 2017, in order to utilize of sharks and rays data collection conducting in collaboration with technical support form shark experts in Southeast Asia and Japan determine on appropriate stock assessment model for sharks and rays.  In year 2018, SEAFDEC/TD will organize training workshop on appropriate stock assessment model. Stock researcher and national technical coordinator for sharks and rays data collection of SEAFDEC MCs will be invited to Training Workshop. Participant will practice on the application of stock assessment and make comprehensive report about shark and ray resources and fisheries status.  In order to ensure the implementation of shark landing data is systematically and accurate collecting at the selected landing sites, SEAFDEC/TD and MFRDMD will technically support to SEAFDEC MCs.  To strengthen on accuracy of data collection and identification, resource persons from MFRDMD and Expert group in Southeast Asia will monitor and transfer knowledge on shark species identification, especially on the species listed by CITES to enumerators of Project Participating Countries.
Activity 3 Sub-activity 3.1 Information dissemination Sub-activity 3.2 Participate to Relevant	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 reference for SEAFDEC Departments, Member Countries, fisheries-related agencies and organizations as well as the general public.

Activity	Description
Regional and International Forum	<p>In order to support management on the utilization of sharks and rays, SEAFDEC/TD in collaboration with SEAFDEC MFRDMD will establish database system to support fisheries manager.</p> <p>This activity has also been collaborated with other relevant initiatives, organizations, and partners, in particular to the issues related to sharks data collection. In this connection, the activity includes participation of staffs in the regional and international meeting or forums, e.g. WCPFC, IOTC, CITES and etc, to monitor on the current issues that significant information to sustainable utilization of Sharks and Rays.</p> <p>In year 2019, SEAFDEC will facilitate and technical assisting to draft NPOA-Shark for MCs where NPOA-Shark has not been formulated yet if there are any requests from MCs where NPOA-Shark has not been formulated yet.</p>

### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2017

(Unit: USD)

Activity	Sub-Activity	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			
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					3,000	13,650	7,700
	Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection	4,000	4,000	4,000	4,000	5,000	9,300	4,500
	Sub-activity 2.3 Improve quality of data collection to support fisheries management					32,500	32,300	29,000
Activity 3. Information dissemination	Sub-activity 3.1 Information dissemination	1,000	1,000	1,000	1,000	2,000	3,950	1,500
	Sub-activity 3.2 Participate to Relevant Regional and International Forum				3,000	5,000	5,000	1,500
<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>44,200</b>

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

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

The major achievement of project implementation in year 2017 is the finding the way to get the information based on existing sharks and rays data in Southeast Asian countries in order to support fishery management measure. The project has determined Yield Per Recruit model (YPR) as appropriate method for examining resource and fishery status for sharks and rays in consultation with resource persons and stock assessment researcher from the Southeast Asian countries through organize a series of consultation meeting. YPR was selected by the consensus of participant and it will be used in the Southeast Asian region.

Regional network of shark and ray scientists and stock assessment researchers has been established after organizing the meeting. The online communication to sharing information and knowledge is well implemented.

Additionally, experienced and lesson learned from the one-year sharks and rays data collection during 2015-2016 revealed that sharks and rays data in Cambodia is still insufficient for supporting fishery management and Cambodia's researcher still needs more technical support on the building human resources capacity on data collection and sharks and rays identification at species level. Sharks and rays data collection in Cambodia was extended one more year and all information was collected based on the Standard Operational Procedures (SOP) on Sharks and Rays Data Collection developed through the project implementation. Data collection in Cambodia will be completed in August 2018 and envisage outputs are as follow;

- 1) Report of sharks and rays data during September 2017 - August 2018
- 2) Capacity building Cambodia's enumerators in the appropriate techniques in identifying species and recording the morphometric and meristic data of sharks and rays.
- 3) Sets of the recommendation for improving management of shark and rays fisheries in participating countries.

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

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Human resource development programs					
Sub-activity 1.1 Human resource development programs					
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		6	2		4,060
Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection		2	2		10,620
Sub-activity 2.3 Improve quality of data collection to support fisheries management		8	11	2	25,645

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 3 Information dissemination					
Sub-activity 3.1 Information dissemination					
Sub-activity 3.2 Participate to Relevant Regional and International Forum			2		2,880

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

Planned activity	Expected outcome/output	Achievements
Activity 1 Human resource development programs through the project of improvement of sharks data collection in Cambodia The activities composed with 3 main sub activities	Human resource of Fisheries Administration (FiA) Cambodia on the Sharks and Rays identification and data collection	<ol style="list-style-type: none"> <li>Capacity building Cambodia's enumerators in the appropriate techniques in identifying species and recording the morphometric and meristic data of sharks and rays</li> <li>Enumerators of FiA Cambodia can conduct the training to other researcher on the Sharks and Rays identification and data collection.</li> </ol>
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 Cambodia include the 2.1.1) Technical Meeting on Sharks and Rays Data Collection Planning 2017-2018 2.1.2) Sharks and rays data collection in Cambodia  Sub-activity 2.2: Monitoring the implementation of national activities and on-site training on sharks and rays data collection and identification in Cambodia  Sub-activity 2.3: 2.3.1) Technical Meeting on determining the appropriate model for assessment of shark stocks based on existing data from Southeast Asian countries 2.3.2) Technical Consultation Meeting on Improvement of Shark Data Collection and Stock Assessment Model	<ol style="list-style-type: none"> <li>Summary Report Technical Meeting on Sharks and Rays Data Collection Planning 2017-2018</li> <li>Report of sharks and rays data during September 2017 - August 2018</li> <li>Certify and improve quality of data collection</li> <li>Consensus of determining appropriate shark stock assessment model by stock assessment researcher.</li> <li>Establishment network of stock assessment scientists in Southeast Asian region</li> </ol>	<ol style="list-style-type: none"> <li>One-year data collection in Cambodia during September 2017 - August 2018</li> <li>Taxonomic information of sharks and rays caught in Cambodia.</li> <li>Compiled information and utilization of sharks and rays.</li> <li>National data sets had been validated by the regional experts.</li> <li>Participating countries initiate to utilize data as scientific information in order to develop sharks and rays fishery management measure.</li> </ol>

Planned activity	Expected outcome/output	Achievements
Activity 3 Sub-activity 3.1 Information dissemination  Sub-activity 3.2 Participating in training workshop for sharks and rays	1. Capacity building SEAFDEC's researcher in teaching skill in sharks and rays identification	1. SEAFDEC researcher could transfer sharks and rays identification knowledge to Cambodia local enumerator through on-site training.

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

List of completed publications for the year 2017	Type of media	Attached e-file
1. Report the Technical Meeting to Determination Appropriate Model for Shark Stock Assessment in Southeast Asian Region	Hard copy	
2. Summary Report Technical Meeting on Sharks and Rays Data Collection Planning 2017-2018	Hard copy	
3. Report the Technical Consultation Meeting on Shark Stock Assessment and Improvement of Data Collection in Southeast Asian Region	Hard copy	

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

Planned activity	Evaluation/ Views from Participants
Activity 1 Human resource development programs Sub-activity 1.1 Human resource development programs	The human resource capacity building has conducted together with activities 2.1, 2.2 and 2.3.
Activity 2 Support SEAFDEC Member Countries to implement shark data collection at landing site(s)	With guidance from project advisors, Twelve (12) months of sharks and rays data during September 2017 to August 2018 were recorded and national report of sharks and rays data collection was published. This information will be conveyed to policy maker in order to develop NPOA in future
Sub-activity 2.1 Sharks and rays data collection in Southeast Countries	Resource persons from MFRDMD and SEAFDEC/TD transfer experience and knowledge of shark sharks and rays data collection and identification to local enumerator of Cambodia. With this regards, local enumerator can conduct systematically and correctly data collection and identify shark and rays at species level.
Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection	Based on existing data in Southeast Asian region, YPR model was adopted as the most appropriate to assess the resource and fishery status of sharks and rays by consensus of Southeast Asian stock assessment researcher in consultation with Japanese expert.
Sub-activity 2.3 Improve quality of data collection to support fisheries management	
Activity 3 Information dissemination Sub-activity 3.1 Information dissemination	Two (2) SEAFDEC's researchers who participating in the sharks and rays identification training workshop are able to train SEAFDEC MCs researcher to identify sharks and rays at species level.

#### 6. Major Impacts/Issues

Even though the end of this year project will accomplished with appropriate model for assessing resource and fishery status of sharks and rays, but SEAFDEC member researcher have limit of knowledge to use this model. Therefore, project need to promote and train this model to Member Countries through organize 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. Additionally, twelve (12) months is insufficient for proving that appropriate model which was determined in year 2017 is fitting to assess shark and ray stock or not. Therefore, if possible, project should support data collection three more year from 2018-2020

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1 Human resource development programs		
Sub-activity 1.1 Human resource development programs	Capacity building on Sharks and Rays stock assessment model to national researchers will be conducted through Activities 2.1 Data collection and monitoring on the accuracy of data collected in landing site(s) of SEAFDEC MCs will be conducted through Activities 2.2 and 203	
Activity 2 Support SEAFDEC Member Countries to implement shark data collection at landing site(s)	With guidance from project advisors, Twelve (12) months of sharks and rays data during September 2017 to August 2018 were recorded and national report of sharks and rays data collection was published. This information will be conveyed to policy maker in order to develop NPOA in future	
Sub-activity 2.1 Sharks and rays data collection in Southeast Countries	Three (3) 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.	13,650
Sub-activity 2.2 Monitoring process in the participating countries of sharks and rays data collection	In order to monitor the national data collection, data base of shark and rays will be developed and local enumerator will be requested to monthly input data into database. With that regards, developer of sharks and rays data base will organize on-site training on input and usage of database for sharks and rays.	9,300
Sub-activity 2.3 Improve quality of data collection to support fisheries management	Training workshop on using YPR model for assess resource and fishery status of sharks and rays in Southeast Asian region	32,300
Activity 3 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	3,950
Sub-activity 3.1 Information dissemination	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 e.g. WCPFC, IOTC and etc.	5,000

#### 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1 Human resource development programs	Shark researchers of SEAFDEC MCs understand the appropriated stock assessment model and be able to find the shark stock assessment of dominant species in their countries. Output is linked with Sub-activities 2.1, 2.2 and 2.3
Activity 2 Support SEAFDEC Member	

Proposed Activity	Expected Outcomes/Outputs of Activity
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	Enhancing the knowledge of fishery officer on assessment of resource and fishery status by using YPR assessment model.
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 Meeting on Sharks and Rays Data Collection

### 3. Schedule of Activity for the Year 2018

Proposed Activity	2018											
	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 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												
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												
Activity 3 Information dissemination												
Sub-activity 3.1 Information dissemination												

*Remark: Activity 2.1 and 2.2 will be conducted from April 2018 - March 2019*

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			Project id: 20130108
<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: Activity 3. Harmonization of fishery statistics in the Southeast Asian region		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2013 - 2017
<b>Lead Department:</b>	TD/Secretariat	<b>Lead Country:</b>	Viet Nam
<b>Donor/Sponsor:</b>	JTF	<b>Total Donor Budget:</b>	USD 29,840 (5-year)
<b>Project Partner:</b>	-	<b>Budget for 2017:</b>	USD 5,700
<b>Project Leader:</b>	Nualanong Tongdee	<b>Involved Country:</b>	All AMSs

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

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

The primary goals of collecting regional fishery statistic are to obtain the information that could provide better understanding of fishery resources at regional level, and serve as a basis for policy planning and management for sustainable fisheries. Activities would be carried out under this project to enhance understanding of Member Countries on regional fishery statistics framework, and support reporting of their respective national statistics in accordance with the framework. In addition, the project would also be enhanced to provide platform for utilization of regional fishery statistics and other data and information as a basis for sustainable utilization of fishery resources in the region.

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

SEAFDEC has been undertaking initiatives in collating fishery statistics from countries bordering the South China Sea Areas since 1976, and starting from 2008 onwards, the framework for compilation of statistics data was changed to cover countries in the Southeast Asian region. The new regional statistics framework was endorsed by the SEAFDEC Council during its 40<sup>th</sup> Meeting, and subsequently at the 16<sup>th</sup> Meeting of the ASEAN Sectoral Working Group on Fisheries in 2008. Nevertheless, fishery Statistics collected by different countries in the region are at the different levels, depending on the capacity, resources allocation and policy in data collection. Although effort has been exerted to harmonize the compilation of statistics at the regional level based on the regional statistics framework, there are still disparities of data from different countries. Besides, SEAFDEC Departments have been undertaking several programs/projects to enhance data collection from countries, which is envisaged to result in better statistics and data collection. The eventual goal is still to obtain better official statistics in order to come up with long-term data that could provide better pictures on status and trends of fisheries for the region as a whole.

This project is therefore proposed to continue supporting the reporting of statistics by the ASEAN Member Countries in line with the new fishery statistics framework, and enhancing the capacity of countries in reporting of their national statistics for regional compilation. In addition, the project would also provide platform for improving the utilization of fishery statistics, integrating with other forms of data and information to generate better understanding of fishery resources.

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

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

Objectives	Outcomes	Outputs	Activity
Objective 1: To improve compilation of fishery statistics from countries in the region	Outcome 1: Improved understanding of Southeast Asian countries on harmonized requirements for compilation of regional statistics	Output 1: Strengthened coordination between SEAFDEC and Member Countries and relevant organizations on statistics-related matters	Activity 1: Coordination of work and participation in the relevant Consultations/ Meetings
	Outcome 2: More reliable and complete statistics data submitted from Southeast Asian countries	Output 2: Improved reporting of statistics by the ASEAN Member Countries in line with the harmonized framework for fishery statistics of Southeast Asia	Activity 2: Preparation/dissemination of materials to support the collection/reporting of statistics from Member Countries
Objective 2: To improve information on status and trends of fisheries and aquaculture of the region	Outcome 3: Improved understanding on status of fisheries in the region	Output 3: Enhanced utilization regional fishery statistics and other data and information to provide understanding on fisheries	Activity 3: Production of publication on Southeast Asian State of Fisheries and Aquaculture

#### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Coordination of work and participation in the Consultations/Meetings of relevant projects	Coordination/communication with Member Countries, and officer in charge in FAO for compilation of statistics, to clarify the submission of statistics based on the regional statistics framework.
Activity 2: Preparation/dissemination of materials to support the collection/reporting of statistics from Member Countries	Preparation/dissemination of publications/materials that enhance better understanding of countries on the regional framework for fishery statistics, to facilitate submission of national statistics accordingly.
Activity 3: Production of publication on Southeast Asian State of Fisheries and Aquaculture	Production/dissemination of the publication on Southeast Asian State of Fisheries and Aquaculture, which include information on status and trends of fisheries, important fisheries-related issues, etc., which should provide basis for management for sustainable fisheries.

#### 3.3 Activity, Sub-activity and Proposed Budget for 2013-2017

(Unit: USD)

Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1: Coordination of work and participation in the Consultations/Meetings of relevant projects	1,500	1,500	1,700	-	-
Activity 2: Preparation/dissemination of materials to support the collection/reporting of statistics	5,500	4,240	-	-	-
Activity 3: Production of publication on Southeast Asian State of Fisheries and Aquaculture (SEASOFIA)	-	-	4,000	5,700	5,700

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

### 1. Achievements of the Project Implementation for the 2017

In 2017, SEAFDEC continued coordination with Member Countries and relevant organizations to support submission of national statistics for regional/international compilation. Specifically, SEAFDEC attended in the CWP Intersessional Meeting Aquaculture and Fisheries Subject Group (19-21 June 2017, Copenhagen, Denmark) to share view on situation on fishery statistics of the region, and keep updating on development of new global standards, classifications and definition on fishery statistics.

With regards to production of the publication on Southeast Asian State of Fisheries and Aquaculture (SEASOFIA), the draft SEASOFIA which was tabled for discussion/consideration at the SEAFDEC Program Committee at its 39<sup>th</sup> Meeting in November 2016 was finalized, accommodating comment from the PCM. The publication was published and disseminated in 2017.

In 2017, SEAFDEC also organized a meeting with a view of improving compilation of regional statistics and provide awareness of AMSs on development of new fishery statistics standards (as informed during the CWP Intersessional Meeting). The Regional Technical Consultation on Fishery Statistics and Information in Southeast Asia was organized on 15-18 August 2017, Bangkok, Thailand, and came up with updated status and suggestions for improving report of national statistics from AMSs for regional compilation. The requirements for improving the collection and reporting of the statistics, *e.g.* for migratory species and species under international concerns, for regional compilation were noted. The update on development of global standards on fishery statistics, *i.e.* the International Standard Statistical Classification of Fishing Gears (ISSCFG), International Standard Statistical Classification of Aquatic Animal and Plants (ISSCAAP), and the new standard questionnaires on aquaculture statistics were also discussed for future incorporation in the region's fishery statistics framework. The Consultation also agreed that in the future, the statistics on fish trade and fish processing would be included in the Fishery Statistical Bulletin of Southeast Asia based on the revised Regional Framework.

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

List of Actual Sub-activity (1)	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1: Coordination of work and participation in the Consultations/ Meetings of relevant projects					
1.1 On-going coordination works on fishery statistics	VI. Other	-	-	-	-
1.2 Attendant to CWP Intersessional Meeting Aquaculture and Fisheries Subject Group (19-21 June 2017, Copenhagen, Denmark)	VI. Other	-	1	-	*
Activity 3: Preparation of publication on Southeast Asian State of Fisheries and Aquaculture (SEASOFIA)					
3.1 Publishing of SEASOFIA 2017 (800 copies)	III. Information	-	-	-	5,700 (Estimated)
Additional Activity: Regional Technical Consultation on Fishery Statistics and Information in Southeast Asia (15-18 August 2017, Bangkok, Thailand)	IV. Policy development activities	7	26	1	**

\* Using MRC

\*\* Using JTF

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

Planned Activity	Expected Outcome/Output	Achievement
Activity 1: Coordination of work and participation in the Consultations/ Meetings of relevant projects		
1.1 On-going coordination works on fishery statistics	Coordination for smooth progress of statistics compilation.	100%
1.2 Attendant to CWP Intersessional Meeting Aquaculture and Fisheries Subject Group (19-21 June 2017, Copenhagen, Denmark)	SEAFDEC be updated on international standards in relation to fishery statistics.	100%
Activity 3: Preparation of publication on Southeast Asian State of Fisheries and Aquaculture (SEASOFIA)		
3.1 Publishing of SEASOFIA 2017 (800 copies)	Publication published and disseminated.	100%
Additional Activity: Regional Technical Consultation on Fishery Statistics and Information in Southeast Asia (15-18 August 2017, Bangkok, Thailand)	Representatives from 7 AMSs attended and shared views on discussion topics.	100%

### 4. List of Completed Publications and Others

List of completed publications for the year 2017	Type of media	Attached e-file
Southeast Asian State of Fisheries and Aquaculture 2017 (800 copies)	Publication	<a href="http://www.seafdec.org/download/southeast-asian-state-fisheries-aquaculture-2017/">http://www.seafdec.org/download/southeast-asian-state-fisheries-aquaculture-2017/</a>
Report of the RTC on Fishery Statistics and Information in Southeast Asia (50 copies, under publishing process)	Publication	

### 5. Major Impacts/Issues

- Coordination and attendant to Meeting enable SEAFDEC to be updated on situation on availability of fishery statistics in Member Countries, and on-going development of relevant new standards at the global level.
- Publication on Southeast Asian State of Fisheries and Aquaculture 2017 is envisaged to enhance understanding on status and trends of the Southeast Asian region, and could serve as reference
- Based on the recommendations from the RTC on Fishery Statistics and Information held in 2017, it could be envisaged that statistics from countries provided to SEAFDEC for regional compilation could be improved. The recommendations from the RTC also pave the way toward future improvement of statistics from the region to be standardized and harmonized with the recently developed international standards, and the regional statistics bulletin to include additional components of fishery statistics.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2018

The Project was completed in 2017.

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			Project id: 2013040102
<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>Program Thrust:</b>	IV	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Philippines
<b>Donor/Sponsor:</b>	JTF VI	<b>Total Donor Budget:</b>	USD 316,818
<b>Project Partner:</b>	TD, Secretariat	<b>Budget for 2018:</b>	USD 41,947
<b>Project Leader:</b>	Raja Bidin bin Raja Hassan until February 2017 Mohammad Faisal bin Md Saleh since 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).

### 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 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	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

Objective	Outcomes	Outputs	Activities
	improved.	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					
	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	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
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							3,933
	Sub-activity 4.2: Preparation and publishing of terminal report							30,000
<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>33,933</b>

## PART II: ACHIEVEMENT OF 2017 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 conducted the Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region in Dorsett Hotel, Kuala Lumpur, Malaysia on 7-8 March 2017. The purpose of this workshop is to understand the concept and data-requirement for several management measures for purse seine fisheries in ASEAN region and to train responsible officers from AMSs for updating their skills in analyzing stock indicators for purse seine fisheries. Based on Allowable Biological Control (ABC) method/rules during the workshop, Rule 2-1 and Rule 2-2 (feedback control) are applicable. This method is appropriate to multispecies situation and may become as the first step for the management strategies for sustainable Purse Seine fisheries in this region. We may also have discussed another CPUE index such as Catch per Trip and Catch per Haul because currently we only use Catch/No of Vessel because of the current data availability.

MFRDMD carried out the “Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region” on 12-14 September 2017 in Kuala Lumpur, Malaysia. The meeting was 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 shared the latest information about landings and CPUEs of purse seine fisheries in the region, sharing information or experience of the current management measures for purse seine fisheries in some members countries (Thailand and the Philippines) and understanding the population structure for *Amblygaster sirm*. A meeting report will be published before February 2018.

Genetic samples from spotted sardinella (*Amblygaster sirm*) collected by participating member countries were analyzed and the preliminary result based on eight sampling locations (namely Muara, Brunei DS; Kuantan, Kuching and Kudat, Malaysia; Palawan and Bataan, Philippines as well as Songkla and Ranong, Thailand). The result will be presented during the CEM September 2017.

## 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		7MFRDMD	1 (Hokkaido)	7,933
Activity 2					
Sub-activity 2.4: Data compilation and analysis (Genetic)	Research		3MFRDMD		5,000
Activity 3					
Sub-activity 3.1: Core Expert Meeting/Workshop	Information	18	9MFRDMD, 1TD, 1SEC,	2	21,000

## 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	Report of the 2 <sup>nd</sup> CEM (2016) was published in August 2017. Hokkaido University, Japan in collaboration with MFRDMD conducted the preliminary survey on species composition of purse seine fisheries in 5 major landing centers along the East Coast of Peninsular Malaysia from 13-23 August 2017.
Activity 2		
Sub-activity 2.3: Genetic study	Genetic population analysis of spotted sardinella ( <i>Amblygaster sirm</i> ).	Genetic samples from spotted sardinella ( <i>Amblygaster sirm</i> ) collected by participating member countries were analyzed and the preliminary result based on eight sampling locations (namely Muara, Brunei DS; Kuantan, Kuching and Kudat, Malaysia; Palawan and Bataan, Philippines as well as Songkla and Ranong, Thailand). The result was presented during the CEM September 2017.  MFRDMD visited RIMF, Indonesia on 17 <sup>th</sup> January 2017 to discussed on Indonesian specimens collection and laboratory analysis due to restriction on exporting specimens to MFRDMD.
Activity 3		
Sub-activity 3.1: Core Expert Meeting/Workshop		MFRDMD conducted the Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region in Dorsett Hotel, Kuala Lumpur, Malaysia on 7-8 March 2017. The purpose of this workshop is to understand the concept and data-requirement for several management measures for purse seine fisheries in ASEAN region and to train responsible officers from AMSs for updating their skills in analyzing stock indicators for purse seine fisheries. Based on Allowable Biological Control (ABC) rules during the workshop, Rule 2-1 and Rule 2-2 (feedback control) as applicable. Its leads the first step for the management strategies for sustainable Purse Seine fisheries in the region.  Also, MFRDMD carried out the “Core Expert Meeting on Comparative Studies for Management of Purse

Planned activity	Expected outcome/output	Achievements
		Seine Fisheries in the Southeast Asian Region” on 12-14 September 2017 in Kuala Lumpur, Malaysia. The meeting was 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 shared the latest information about landings and CPUEs of purse seine fisheries in the region, sharing information or experience of the current management measures for purse seine fisheries in some members countries (Thailand and the Philippines) and understanding the population structure for <i>Amblygaster sirm</i> . A meeting report will be published before February 2018.

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

List of completed publications for the year 2017	Type of media	Attached e-file
Meeting report for “The Second Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region, 2016”	Pdf, Print	

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

Planned activity	Evaluation/ Views from Participants
Activity 3	
Sub-activity 3.1	MCs representatives have learned ABC and ABE calculation for analyzing catch and effort information in terms of developing management strategies for purse seine fisheries based on multispecies situation in the region during the workshop.

#### 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.

For genetic study of *Amblygaster sirm*, there are several difficulties including bureaucratic procedures and legislations to bring samples from countries to MFRDMD, which makes regional genetic studies difficult. Some samples sent from Member Countries were misidentified, showing some Member Countries has still have difficulties in species identification of small pelagic species.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
Sub-activity 1.3 Comparison of TAC systems in the world (including other management measures)	SEAFDEC/MFRDMD will continue synthesizing regional information of purse seine fisheries based on the updating data given by MCs.	8,908
Activity 2		
Sub-activity 2.4: Data compilation and analysis	SEAFDEC/MFRDMD will complete genetic analyses to study stock structure of <i>Amblygaster sirm</i> in the Southeast Asian region. The results will be presented	9,825

Proposed Activity	Description of Proposed Activity	Proposed Budget
	during the Core Expert Meeting in 2018.  DNA barcoding study of <i>Amblygaster sirm</i> and other <i>Sardine</i> sp inferred by mtDNA COI  Tissue sample from the previous study will be used for DNA Barcoding analysis. A total of 120 samples (15 each from 8 locations) will be used for data analysis. The result will support for population study report and will be published for terminal report on 2019.	
Activity 3		
Sub-activity 3.1 Core Expert Meeting/Workshop	MFRDMD will organized a Core Expert Meeting to further discuss and update on the current status of purse seine fisheries in the South China Sea and Andaman Sea as well as the result of genetic study of the small pelagic fish. Representatives from each participating member countries will be invited to attend the CEM. Management systems of purse seine fisheries in the region and member countries will be discussed.	23,214

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
Sub-activity 1.3 Comparison of TAC systems in the world (including other management measures)	Information of regional purse seine fisheries will be synthesized and updated. The applicable management systems/measures for purse seine fisheries in the region will be developed.
Activity 2	
Sub-activity 2.4: Data compilation and analysis (genetic)	Stock structure of shared small pelagic fish targeted by purse seine fisheries in the region will be updated and identified.
Activity 3	
Sub-activity 3.1 Core Expert Meeting/Workshop	MFRDMD will present the result based on the management system that had been determined and MCs will discuss this management systems.

## 3. Schedule of Activity for the Year 2017

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activity 1.3 Comparison of TAC systems in the world (including other management measures)												
Activity 2												
Sub-activity 2.4: Data compilation and analysis												
Activity 3												
Sub-activity 3.1 Core Expert Meeting/Workshop												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

Project id: 201504003
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<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>Program Thrust:</b>	IV	<b>Total Duration:</b>	2015 - 2019
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Malaysia
<b>Donor/Sponsor:</b>	JTF VI	<b>Total Donor Budget:</b>	USD 235,578
<b>Project Partner:</b>	TD, Secretariat	<b>Budget for 2018:</b>	USD 75,817
<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 Vietnam. 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 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		25,909
	Sub-activity 1.3: Identification of shark and ray species by DNA bar- coding	18,900	10,000	13,500	27,400	11,590
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					6,293
	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>43,792</b>

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

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

**Sub-activity 1.1:** SEAFDEC/MFRDMD also supported Viet Nam for 12 months data collection at Vung Tau and Vinh Dinh landing sites from September 2016 to August 2017. Other information collected and will be collected including landing data up to species level, biology, marketing destination, as well as collecting tissue for DNA analysis for further analysis to confirm look a-like species or possibility of new species. In order to strengthening capabilities of facilitators in Viet Nam, MFRDMD organized ‘On-Site Training on Chondrichthyns Taxonomy and Biology’ from 26-29 September 2017, at South Research Sub-Institute for Marine Fisheries (SORESIMF) Vung Tau, Viet Nam. This activity was conducted in collaboration with the Directorate of Fisheries, Ministry of Agriculture and Rural Development of the Socialist Republic of Viet Nam. Overall objective is to enhance human resource development in elasmobranch taxonomy and biology and specific objectives are;

- i. To report the outcome of research findings based on data and information collected at Vung Tau in 2016,
- ii. To conduct a training course on chondrichthyans taxonomy and biology for new participants
- iii. To train trainees in the appropriate techniques in recording the morphometric and meristic data and
- iv. To train trainees in collecting and preserving specimens as well as to collect tissue samples for DNA study

Activity 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 2016, data management, and standard operation procedure (SOP) on data collection up to species level. Practical at laboratory 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 m of sharks, rays and skates also collected for DNA bar-coding analysts.

**Sub-activity 1.2:** SEAFDEC/MFRDMD organized ‘Regional Training and Workshop on Chondrichthyan Taxonomy, Biology and Data Collection’ from 13- 17 August 2017 at SEAFDEC/MFRDMD, in Kuala Terengganu, Malaysia. Overall objective is to enhance human resource development in elasmobranch taxonomy and biology as well as technique in data collection of sharks and rays up to species level. Specific objectives are:

- i. To conduct a training course on chondrichthyans taxonomy and biology for new Participants
- ii. To train trainees in the appropriate techniques in recording the morphometric and meristic data at landing sites
- iii. To train trainees in collecting and preserving specimens as well as to collect tissue samples for DNA study
- iv. To train trainees in collecting and preserving specimens
- v. To train trainees in management of data recorded at landing sites for NDFs and other purposes.

Activities during the training included lectures on taxonomy, biology (reproduction mode of sharks and rays), preservation of specimens, data management, and standard operation procedure (SOP) on data collection up to species level. Practical at laboratory included identification of common sharks and rays species commonly found in coastal waters in this region, 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. Workshop on verification of data and analysis of landing data using pivot table application also conducted using data recorded during the training and simulation data from Malaysia.

**Sub-activity 1.3:** MFRDMD had analyzed 122 and 120 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>). Among them a total of 8 species of sharks, 6 species of rays and 2 species of skates were genetically identified from 15 out of 35 specimens (43%) sharks, 10 out of 22 specimens (59%) and 5 out of 8 specimens (63%) skates which were collected from Vung Tau, Viet Nam in 2016.

Among them, 4 species of sharks (*Rhincodon typus*, *Sphyrna lewini*, *S. mokarran*, *S. zygaena*) corresponds to 37% of the number of sharks (11 specimens) currently listed in Appendix II CITES, which greatly contributes to fulfillment of NDFs requirements and other management purposes in the future.

**Sub-activity 2.1:** MFRDMD also proposed to conduct ‘A Survey on Fishers Dependencies, Marketing and Trade of Sharks and Rays in Java and Sumatera, Indonesia’. Prospectus of the project was submitted to Council Director of Indonesia in June 2017 and still pending for approval form the government of Indonesia. The overall objective of the study is to examine sharks trade and marketing in Indonesia. The specific objectives are:

- i. To study the shark and rays marketing and trade in Java and Sumatera, Indonesia;
- ii. To identify the major actors in the marketing and trade of sharks and rays at study areas;
- iii. To study the sharks and rays marketing channels and practices in selected areas in Java and Sumatera; and
- iv. To collect basic information on socio economy and trade data for preparation of NDFs for Indonesia.

Methodology proposed are descriptive analysis using secondary data from local and federal fisheries statistic office or custom data and marketing channel analysis by survey. The team from MFRDMD proposed to visit Research Center for Fisheries, Jakarta Indonesia/ Research Center for Socio-economic of Marine and Fisheries for to explanation of survey and discussion with relevant Government officers of Indonesia, visiting landing site at Cilacap, and Pelabuhan Ratu, visiting markets at Surabaya and Semarang in October 2017.

## 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: On-Site Training in the region (Viet Nam)	Training	20 (Viet Nam)	6 MFRDMD	0	11,634

Sub-activity 1.2 'Regional Training and Workshop on Chondrichthyan Taxonomy, Biology and Data Collection' 13- 17 August	Training	2 (Cambodia)	2 MFRDMD, 2 TD	0	16,625
		2 (Myanmar)			
		2 (Viet Nam)			
		2 (Philippines)			
		2 (Malaysia)			
		1 (Indonesia) 2 (Thailand)			
Sub-activity 1.3: Identification of shark and ray species by DNA bar-coding	Research	1 (Viet Nam) 2 (Malaysia)	6 MFRDMD	0	13,500 (500) Sequences =USD233 Chemical & consumable= USD 267
Activity 2. Utilization of By-catch Sharks and Rays					
Sub-activity 2.1: County visits	Research	2 (Indonesia)	2 MFRDND	0	4,433* (not implement yet)

### 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 information on status of biodiversity of sharks, rays and skates in SEAFDEC member countries was published in SEASOFIA 2017. Based on regional and national studies conducted by SEAFDEC and SEAFDEC in from 2003 to and 2016, the total number of species of sharks, batoids and chimaeras species in each country of Southeast Asian Region are 182 (increased from 174 species as recorded in 2012), 148 and 7 species respectively. The latest check list of chondrichthyans biodiversity in the participating Member Countries are updated in 2017 as in table below:</p> <table border="1"> <thead> <tr> <th>Countries</th> <th>Sharks</th> <th>Batoids</th> <th>Chimaeras</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Cambodia</td> <td>11</td> <td>54</td> <td>0</td> <td>65</td> </tr> <tr> <td>Indonesia</td> <td>117</td> <td>106</td> <td>4</td> <td>227</td> </tr> <tr> <td>Lao P.D.R.</td> <td>0</td> <td>3</td> <td>0</td> <td>3</td> </tr> <tr> <td>Malaysia</td> <td>70</td> <td>91</td> <td>1</td> <td>162</td> </tr> <tr> <td>Myanmar</td> <td>59</td> <td>87</td> <td>0</td> <td>146</td> </tr> <tr> <td>Philippines</td> <td>94</td> <td>66</td> <td>3</td> <td>163</td> </tr> <tr> <td>Thailand</td> <td>76</td> <td>82</td> <td>2</td> <td>160</td> </tr> <tr> <td>Viet Nam</td> <td>52</td> <td>54</td> <td>0</td> <td>106</td> </tr> </tbody> </table>	Countries	Sharks	Batoids	Chimaeras	Total	Cambodia	11	54	0	65	Indonesia	117	106	4	227	Lao P.D.R.	0	3	0	3	Malaysia	70	91	1	162	Myanmar	59	87	0	146	Philippines	94	66	3	163	Thailand	76	82	2	160	Viet Nam	52	54	0	106
Countries	Sharks	Batoids	Chimaeras	Total																																											
Cambodia	11	54	0	65																																											
Indonesia	117	106	4	227																																											
Lao P.D.R.	0	3	0	3																																											
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Philippines	94	66	3	163																																											
Thailand	76	82	2	160																																											
Viet Nam	52	54	0	106																																											
Sub-activity 1.1: On-site training in the region (Viet Nam)	Trained staffs are able to make the right and valid identification of species at landing site during data collection activities.	<p>'On-Site Training on Chondrichthyns Taxonomy and Biology' was successfully conducted from 26-29 September 2017 at SORESIMF in Vung Tau, Viet Nam. Twenty participants from local fisheries agencies and universities had attended. The training was conducted by five officers from MFRDMD.</p> <p>During the training all participants were guided to identify 18 species of sharks, 18 species of rays and five</p>																																													

Planned activity	Expected outcome/output	Achievements
		<p>species of skates. Participants were also guided to identify sharks, rays and skates to order, family, genus and species using several references published by MFRDMD. As well as photographic techniques for taxonomy used. Out of 41 species of elasmobranchs recorded, at least five species of rays and one species of skates had been found as a new record for Viet Nam.</p> <p>MFRDMD researchers also collected tissue from eight species of sharks, six species of rays and two species of skates for DNA barcoding study.</p>
<p>Sub-activity 1.2 Workshops on identification of sharks and rays in the region (Regional Training and Workshop on Chondrichthyan Taxonomy, Biology and Data Collection' Kuala Terengganu 13-17 August 2017)</p>	<p>Member countries will come up with complied and verified landing/biological data of sharks and rays as well as marketing and trade information of sharks and rays.</p>	<p>Regional Training and Workshop on Chondrichthyan Taxonomy, Biology and Data Collection held from 13-17 August 2017. Eleven participants and six observers attended this training. They were two participants from each country namely Malaysia, Myanmar, Viet Nam, Cambodia, Thailand, and TD, while Indonesia only representing by one participant. Two observers were from MFRDMD, three were final year degree student from local universities and one from Malaysia.</p> <p>During the training and workshop all participants and observers were guided by experiences lecturers and facilitators to identify 22 species of sharks and 18 species of rays during practical session at laboratory including photographic techniques for taxonomy used. Participants were also guided to identify sharks and rays to order, family, genus and species using several references published by MFRDMD. They also visited the most important fishing port for sharks and rays in Malaysia situated at Kuantan, in State of Pahang and applied their knowledge to identify six species of sharks and eight species of rays landed at that fishing port.</p> <p>After attended the training and workshop, all participants from Cambodia and Viet Nam are now more confidence to start data collection up to species level as well as verification of data and data analysis. MFRDMD supported Viet Nam and TD supported Cambodia for 12 months data collection up to species level until 2018.</p>
<p>Sub-activity 1.3: Identification of shark and ray species by DNA bar-coding</p>	<p>Genetic information for sharks and rays species identification in the region has been obtained/summarized by DNA bar-coding</p>	<p>In 2017, a total of 8 species of sharks, 6 species of rays and 2 species of skates were genetically identified from 15 out of 35 specimens (43%) sharks, 10 out of 22 specimens (59%) and 5 out of 8 specimens (63%) skates which were collected from Vung Tau, Viet Nam in 2016.</p> <p>Currently, 122 specimens for sharks and 120 specimens of rays were analyzed. 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 (<a href="http://boldsystems.org">http://boldsystems.org</a>).</p> <p>However, the remaining genetic specimens (56 sharks, 65 rays and 2 skates) collected during 2015-16 and other additional specimens will be analyzed soon.</p>

Planned activity	Expected outcome/output	Achievements
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 information of sharks and rays in Java and Sumatera, Indonesia	MFRDMD also proposed to conduct 'A Survey on Fishers Dependencies, Marketing and Trade of Sharks and Rays in Java and Sumatera, Indonesia'. Official letter and prospectus of the project were submitted to Council Director of Indonesia in June 2017. Preparation of all documents requested by Indonesian Government are in progress. Trip to Java tentatively from 29 October to 10 November 2017.

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

List of completed publications for the year 2017	Type of media	Attached e-file
1. Ahmad, A., Abdul Haris Hilmi, A.A., Abe, O., Dharmadhi, Fahmi, Lim, A. P.K. and Krajangdara, T. 2017. <i>Standard Operating Procedures (SOP) Sharks, Rays and Skates Data Collection in the Southeast Asian Waters</i> . SEAFDEC-TD, Bangkok: 41pp	Book published and pdf file uploaded to MFRDMD website	Yes
2. Ahmad, A., Lim, A.P.K., Fahmi, Dharmadi and Krajangdara, T. 2017. Identification Guide to Sharks, Rays and Skates of the Southeast Asian Region. SEAFDEC/MFRDMD/SP/31:32pp	Waterproof guide book published and pdf file uploaded to MFRDMD website	Yes
3. Ahmad, A., Worawit, W. and Isara, C. 2017. Progress of Sharks, Rays and Skates Data Collection in the Southeast Asian Waters (2015-2016). Presented at Workshop Cooperation on Implementing CITES for Marine Species: Achievements, lessons learned and future opportunities 13-15 March 2017, Geneva Switzerland.	Power point	Yes
4. Ahmad, A. 2017. Regional initiatives related to improvement of shark data collection in South East Asia through various programs/projects implementing by MFRDMD. Paper presented at Technical Meeting on Determining the Appropriate Model for Assessment of Shark Stocks Based on Existing Data from Southeast Asian Countries, 7 - 8 June 2017, Bangkok, Thailand.	Power point	Yes
5. Ahmad, A. 2017. MFRDMD involvement in improvement of shark data collection in Southeast Asia. Paper presented at Technical Workshop on Improvement of Regional Fisheries Statistics on Sharks 13-15 June 2017, Siem Reap Cambodia.	Power point	Yes
6. Noorul-Azliaa J., Wahidah M.A., Ahmad A., Le Huu Tuan Anh, Adam-Luke P. & Annie-Nunis B. DNA barcoding reveals species of sharks in Malaysia and Viet Nam. Paper to be presented at Annual meeting of Asian Society of Ichthyologists (ASI 2017), 22-24 August 2017, Ho Chi Minh, Viet Nam.	Power point	Yes
7. Wahidah M.A., Noorul-Azliaa J., Ahmad A., Le Huu Tuan Anh, Adam-Luke P. & Annie-Nunis B. DNA Barcoding of Rays in Malaysia and Viet Nam. Paper to be presented at Annual meeting of Asian Society of Ichthyologists (ASI 2017), 22-24 August 2017, Ho Chi Minh, Viet Nam.	Power point	Yes

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1:	Based on a feedback received on the last day of the training as well as from observation made during the training, most participants can make the right and valid identification of species using guide books as well as guidance from MFRDMD researchers.
Sub-activity 1.2	During the evaluation of activities on the last day of the training workshop, most participants agreed this program was very successfully conducted by MFRDMD, very informative and knowledgeable and presented by experiences and skill lectures. All knowledge gathered during this training and workshop will be very useful for them when conduct data collection study in their countries. Most participants agreed that pivot table analysis will be very useful not only for analysis shark landing data but for also other research project.

## 6. Major Impacts/Issues

### Sub-Activity 1.1

Issue 1: The major issues is a lack of skill to communicate using English language of almost all participants during the training in Viet Nam. Communication skill of some participants found to be below expectation. All lectures as well as teaching during practical were translated to Vietnamese language by local officer.

Plan to tackle this issue 1: Effort to translate latest guidebooks written in English published by MFRDMD to Vietnamese languages should be a priority.

Issue 2: Limited space to keep new specimens collected in Vung Tau due to small size of current freezer led to less new specimens collected and less new records found during the training as compared with the trip in 2016.

Plan to tackle this issue: If possible MFRDMD looking for budget in future to buy new medium size freezer to keep new specimens which are not record yet in Viet Nam for further study by MFRDMD researchers.

### Sub-Activity 1.2

Issue 1: In general, major issues that have impacted on the implementation of sub-activity 1.2 is lack of skill to communicate using English language during the training. Communication skill of some participants found to be below expectation.

Plan to tackle this issue 1: Countries those rarely use English as communication language should increase their skill in future. Effort to translate several guidebooks written in English published by MFRDMD to national languages should be priorities to Myanmar, Cambodia, and Viet Nam.

Issue 2: MFRDMD send invitation letter to SEAFDEC Council Director (SDC) and copy to National Technical Coordinator (NTC) two months before the training but some countries only sent nomination of their participants after deadline and one country never response to MFRDMD's invitation. Last minute nomination by countries will increase fare of air tickets up to 30% compared to early booking and confirmation. This will increase original proposed budget for the training and workshop.

Plan to tackle this issue: All SDC and NTC should look into this matter seriously and send confirmation letter within one month after received invitation letter.

### Sub-activity 1.3:

1. Issue 1: Specimens identified up to genus level only.

Collected specimens were identified only up to genus level during sampling activity by taxonomist (e.g. 10 specimens only identified with *Narcine* spp.) and genbank data was not available (due to no reported data on that particular genus and species) can give 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.

2. Issue 2: Specimen contamination.

Some of the specimens provided by Viet Nam officer in 2016 (e.g. 3 specimens of dried specimens of sharks from Vung Tau, Viet Nam) found to be contaminated with bacteria and not suitable for DNA bar-coding analyst.

Plan to tackle this issue: Dried samples taken or bought from elsewhere are beyond control however all MFRDMD officers always follow the SOPs for DNA study.

## PART III: PROPOSED ACTIVITIES FOR YEAR 2018

### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
Activity 1.1: On-Site Training in the region	<p>Presentation of Report on DNA and data collection study at Vung Tau, Viet Nam</p> <p>Translation of book 'Field rays, skates and chimaeras of the South China Sea' to Cambodian language</p> <p>Translation two books 'Field rays, skates and chimaeras of the South China Sea' and Field guide to sharks in the South China Sea to Vietnamese language</p> <p>Publication of Second Edition of waterproof field guide of sharks, rays and skates in the South China Sea</p>	10,420
Sub-activity 1.3: Identification of shark and ray species by DNA bar-coding	Biological information, catch data and tissue sample of sharks and rays will be collected at selected landing sites in participating countries namely Thailand, Malaysia and Viet Nam. Sample will be analyzed at MFRDMD DNA laboratory for bar-coding. The results will be presented during the Core Expert meeting/Workshop /Progress meeting (e.g. RTC/CEM).	27,400
Activity 2		
Sub-activity 2.1: Country visits: A Survey on Fishers Dependencies, Marketing and Trade of Sharks and Rays in Java and Sumatera, Indonesia	<p>The overall objective of the survey is to collect information on socio-culture-economy, marketing and trade data to support Indonesia on the preparation of NDFs document in future. The specific objectives are:</p> <ul style="list-style-type: none"> <li>i. To survey the dependencies of fishers at selected landing sites in Java and Sumatera towards sharks and rays.</li> <li>ii. To survey the impacts on socio-culture-economy of fishers after several sharks and rays species listed in</li> </ul>	9,871

Proposed Activity	Description of Proposed Activity	Proposed Budget
	<p>Appendix II CITES at selected landing sites</p> <p>iii. To survey the major actors in domestic marketing of sharks and rays especially CITES listed species in Java and Sumatera</p> <p>iv. To survey the sharks and rays trade channels and practices at selected areas in Java and Sumatera; and</p> <p>iv. To evaluate the international trade of on sharks and rays at study areas</p> <p>Activity proposed: Visit relevant government office (custom, fisheries office) at Banda Aceh and Padang, landing sites and marketing center around there, in March and May 2018 and presenting progress report to Government of Indonesia at Research Center for Fisheries, Jakarta Indonesia in June 2017.</p>	
<p>Sub-activity 2.3: Core Expert Meeting (Core expert meeting on taxonomy, biology, marketing and trade of sharks and ray in Southeast Asian Region)</p>	<p>A 3-days Core expert meeting on taxonomy, biology, marketing and trade of sharks and ray in Southeast Asian Region proposed to be held in October 2018. The objective of the meetings is to bring all MCs expert in data collection to present their finding on status of data collection up to species level, marketing, and trade as well as issues relating to CITES-related sharks and rays found in their country. MFRDMD will present draft NDFs for this region based on information and data collected in all countries especially in Indonesia and Malaysia.</p> <p>Participants will also discuss on status of sharks and rays resources in participating countries base on analysis using Model ‘Yield Per Recruit’ (YPR) introduce by TD. Brunei Darussalam will be invited to present it progress after enforced total ban on sharks landing since 2013 and Philippine to report on progress of country to list of all CITES sharks and rays species as protected species in Philippines waters. TD will be invited to present progress of workshop and analysis of landing data using Model ‘Yield Per Recruit’ (YPR).</p>	<p>28,126</p>

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

Proposed Activity	Expected Outcomes/Outputs of Activity	
Activity 1	Outcomes	Output
<p>On-Site Training in the region</p>	<p>MFRDMD strengthens expertise on identification to species and biological data collection on sharks and rays in the region.</p>	<p>MFRDMD promotes DNA and data collection study in Cambodia and translate taxonomical books to Cambodian and Vietnamese languages.</p>
<p>Sub-activity 1.3 Identification of shark and ray species by DNA bar-coding</p>	<p>Information on DNA- bar-coding for sharks and rays in the region updated yearly</p>	<p>Additional bar-coding analyses for sharks and rays in the region</p>
<p>Activity 2</p>		
<p>Sub-activity 2.1: Utilization of By-catch Sharks and Rays</p>	<p>Trends of volume and value including CITES listed species by species and marketing/trade channel trade analyzed for national and regional level management as well as for preparation of draft NDFs for regional guideline.</p>	<p>Information on volume and value on marketing of sharks and rays and marketing and trade channel including those are listing in CITES Appendix II in this region especially in Indonesia and Malaysia.</p>

Sub-activity 2.3 Core Expert Meeting (Core expert meeting on taxonomy, biology, marketing and trade of sharks and ray in Southeast Asian Region)	Trends of landing by species and marketing/information analyzed for national and regional level management.	Status of data collection up to species level, marketing, and trade information as well as issues relating to CITES-related sharks and rays in the region.
	Improved technique on estimated of biomass using short term data (one-year period) for implementation at national and regional level	Information on the progress on implementation of Model 'Yield Per Recruit' (YPR) to estimate biomass of sharks and rays species in the region.
	Status of biomass analyzed for sustainable utilization and management of sharks and rays resources at national and regional level.	Status of biomass of sharks and rays species base on analysis using Model 'Yield Per Recruit' (YPR).
	Development of regional position on CITES listed species for incoming CITES CoP18 in 2019	Issues and problems arising from Brunei Darussalam after enforced total ban on sharks landing since 2013 Issues and problems arising from Philippine after all CITES sharks and rays species listed as protected species in Philippines waters.

### 3. Schedule of Activity for the Year 2018

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activity 1.1: On-site training in the region												
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 2.1: Utilization of By-catch Sharks and Rays												
Sub-activity 2.3 Core Expert Meeting												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

				Project id: 20130601
<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>Program Thrust:</b>	V	<b>Total Duration:</b>	2013 - 2019	
<b>Lead Department:</b>	Secretariat	<b>Lead Country:</b>	Thailand	
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	Estimated USD 766,553	
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD 80,370	
<b>Project Leader:</b>	Somboon Siriraksophon	<b>Involved Country:</b>	All SEAFDEC Members	

## **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 int'l fish trade-related issues	700	000	0	1,000	0	1,500	1,000
	Sub-activity 1.2 Coordinate with other regional and international organizations	15,000	19,000	4,090	32,370	20,400	15,500	32,370
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	58,370	96,100
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	2,000
Sub-Total Budget		<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>131,470</b>

Remark: \* CITES Meeting on the year of 2013, 2016 and 2019

**PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION****1. Achievements of the Project Implementation for the Present Year**

The key achievements of the project implementation for the year 2017 are as follows:

**A: Policy Papers**

- 1) Executive summary report on Regional Initiatives Towards Combating IUU Fishing in the Southeast Asia for 2017;

**B. Guidelines or Management tools**

- 2) ASEAN Catch Documentation Scheme: Info-graphic on ACDS Guide
- 3) ASEAN Catch Documentation Scheme for Marine Capture Fisheries (Concept) endorsed by the 29<sup>th</sup> ASWGFi held in May 2017
- 4) The Electronic System of the ASEAN Catch Documentation Scheme (eACDS) developed in collaboration with SEAFDEC Sweden project

**C. Capacity Building, Information Disseminations and Software/Application**

- 5) Pilot-site Training for testing of the e-ACDS in Brunei Darussalam in the 3rd and 4th Quarters of 2017.
- 6) ASEAN Catch Documentation Scheme: VDO-YouTube
- 7) User's Manual of the eACDS (1st Draft)
- 8) Web-based Application of the eACDS
- 9) Mobile Application of the eACDS

## 2. Information of Present Year Activity including Involved Stakeholders (Jan-October 2017)

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 int'l fish trade-related issues					
i. Addressed the Executive summary report on Regional Initiatives Towards Combating IUU Fishing in the Southeast Asia for 2017 at ASWGF in Singapore	IV. Policy	40	5	-	**
Sub-activity 1.2: Coordinate and address the Regional Issues to other regional and international organizations					
i. Global dialogues on Seafood Traceability: 1 <sup>st</sup> ASEAN Technical Workshop	V. Colla Prog.	-	1	50	**
ii. The CTI-CFF Partners Meeting	V. Colla Prog.	16	2	30	**
iii. Seminar on Traceability for Marine Capture Fisheries organizing by NPO-Marine Products Traceability Association, held on 22-23 May 2017 in Sapporo, Japan	V. Colla Prog.	-	1	25	**
iv. First Meeting of the Parties to the 2009 FAO Agreement on Port State Measures	V. Colla Prog.	15	2	100	**
v. Twenty-ninth meeting of the CITES Animals Committee in Geneva, Switzerland	V. Colla Prog.	20	2	200	10,400
vi. 16 <sup>th</sup> Meeting of the Sub-Committee on Fish Trade	V. Colla Prog.	15	2	70	**
vii. The JSFS 85 <sup>th</sup> Anniversary- Commemorative International Symposium "Fisheries Science for Future Generations"	V. Colla Prog.	20	7	0	**
viii. CTI-CFF/USAID Inception Workshop: Building-Up a regional catch documentation and traceability (CDT) system and advancing fisheries management for strengthening food security in Coral Triangle Region	V. Colla Prog.	20	2	40	**
ix. ASEAN-U.S. Conference on Marine Environmental Issues	V. Colla Prog.	30* (3 Fish)	1	100	**
x. ASEAN-EU High-level Dialogue on Maritime Security Cooperation	V. Colla Prog.	60* (0 Fish)	1	40	**
xi. Official visit/ participation to CITES Secretariat and FAO events on International fisheries-related issues:	V. Colla Prog.		2	(tbc)	10,000
Increased Visibility	<b>Total</b>	<b>236</b>		<b>630</b>	<b>20,400</b>
Remarks * not fisheries sectors, ** Other budgets and Organizer's Sponsors					
Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations					
i. 2 <sup>nd</sup> Consultation Visit for baseline survey and Introduction of the progress eACDS for Pilot Testing in Brunei Darussalam, 29 Jan. - 2	IV. Policy	35	5	-	6,000

List of Actual Sub-activity	Type of activity*	Number of Participants and Audients			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Feb. 2017					
ii. Consultation Visit and Introduction of eACDS to DOF/MY	IV. Policy	25	2	-	1,520
iii. 1 <sup>st</sup> Training on Usage of e-ACDS (issuance CD and MD) to all relevant Stakeholder in Brunei Darussalam from 19-21 June 2017, and BN-eACDS Committee Meeting on 22 June 2017	IV. Policy	35	6	-	12,000
iv. 2 <sup>nd</sup> Training on Usage of e-ACDS (issuance CC) to all relevant Stakeholder and for observers from AMSs in Brunei Darussalam from 17 to 18 October, and 2 <sup>nd</sup> BN-eACDS Committee Meeting on 19 October 2017	IV. Policy	35	6	-	17,700
v. Consultation Visit for Introduction of eACDS to all stakeholders through the collaboration with DOF/VN <i>(will be conducted by end 2017)</i>	IV. Policy	(50-60)	(6)	-	(12,000)
vi. Consultation Visit and Introduction of eACDS to all stakeholders through the collaboration with xx (tbc) <i>(will be conducted by mid of Nov. 2017)</i>	IV. Policy	(40-50)	(6)	-	(5,000)
		<b>Sub Total</b>			<b>54,220</b>
Activity 3: Building the awareness and disseminating from the Project outputs					
Sub-activity 3.1: Publicize the results within and outside the region					
i. Publication on Infographics on ACDS Guide <700 copies>and VDO on eACDS	Info.				1,650
ii. Publication on eACDS Manual <700 copies> <i>(tentative by end of DEC 2017)</i> + VDO on usage of eACDS	Info.				(8,000)
iii. Reprint of Publication on Infographics on ACDS Guide <700 copies>and improve details in the VDO on eACDS <i>(tentative by end of DEC 2017)</i>	Info.				(4,000)
iv. Publication of ACDS Concept <100 copies> <i>(tentative by end of DEC 2017)</i>	Info.				(2,000)
v. Poster on eACDS	Info.				(2,800)
vi. Rental fee on Cloud Server for 3 years by Dec 2017 – Dec 2020 (increased the capacity for eACDS and other system used by AMSs)	Research				(3,000)
vii. Equipment including personal computer to enhance efficiency of work by Technical staffs	Research				(3,200)
		<b>Sub Total</b>			<b>23,000</b>

Remarks: the number in (xxxxx) is the extra budget for 2017 advised from JTF in September 2017

### 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 (i):</u> Reviews and Development of an Executive Report on Regional Initiatives towards Combating IUU Fishing in the Southeast Asia	Executive summary report on Regional Initiatives Towards Combating IUU Fishing in the Southeast Asia for 2017 ( <b>Annex 01</b> )	- The regional initiatives toward combating IUU fishing in Southeast Asian was addressed at the 25ASWGF for consideration and endorsement, in which there are many management tools are linked.
<u>Sub-activity 1.2(i)</u> Global dialogues on Seafood Traceability: 1st ASEAN Technical Workshop	Promoted the SEAFDEC visibility toward Regional Initiatives on combating IUU fishing.	- All relevant stakeholders such as government officers, fishing industry, processors, civil-society organization, regional and international organizations understand the SEAFDEC initiatives toward combating IUU fishing in the ASEAN region; - Future collaboration to support the implementation of the management tools to combat IUU fishing.
<u>Sub-activity 1.2(ii)</u> The CTI-CFF Partners Meeting		
<u>Sub-activity 1.2(iii)</u> Seminar on Traceability for Marine Capture Fisheries organizing by NPO-Marine Products Traceability Association, held on 22-23 May 2017 in Sapporo, Japan		
<u>Sub-activity 1.2(iv)</u> First Meeting of the Parties to the FAO Agreement on Port State Measures	Updated the status of the PSMA implementation and the Summary report of the meeting ( <b>Annex 02</b> )	- SEAFDEC updated the requirement of AMSs on the capacity building program in collaboration with Partners and seek technical support from FAO. - Updated the status for future program on PSM and involvement of Regional bodies.
<u>Sub-activity 1.2(v)</u> Twenty-ninth meeting of the CITES Animals Committee in Geneva, Switzerland	Summary report of the meeting. ( <b>Annex 03</b> )	- Updated the status for future program on PSM and involvement of Regional bodies. - Provided some Recommendations on shark conservation and Management as well as the workplan on Anguillid eels studies by SEAFDEC for further cooperation with FAO and CITES secretariat
<u>Sub-activity 1.2(vi)</u> 16 <sup>th</sup> Meeting of the Sub-Committee on Fish Trade	Summary report of the meeting. ( <b>Annex 04</b> )	- Updated the status on Fish trade-related issues and FAO activities. - Provided some recommendations and seek cooperation from FAO on various Fish Trade-related issues.
<u>Sub-activity 1.2(vii)</u> The JSFS 85 <sup>th</sup> Anniversary- Commemorative International Symposium “Fisheries Science for Future Generations”	Promoted the SEAFDEC programs and enhance the visibility	- Better understand on overall SEAFDEC programs to other stakeholders in Donor country (Japan).
<u>Sub-activity 1.2(viii)</u> CTI-CFF/USAID Inception Workshop: Building-Up a regional catch documentation and traceability (CDT) system and advancing fisheries management for strengthening food security in Coral Triangle Region	Promoted the Regional Initiatives toward combating IUU fishing, and traceability system including the eACDS.	- Better understand on SEAFDEC initiatives toward combating IUU fishing and eACDS

Planned activity	Expected outcome/output	Achievements
<u>Sub-activity 1.2(ix)</u> ASEAN-U.S. Conference on Marine Environmental Issues		
<u>Sub-activity 1.2(x)</u> ASEAN-EU High-level Dialogue on Maritime Security Cooperation		
Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations		
<u>Sub-activity 2.1 (i)</u> 2 <sup>nd</sup> Consultation Visit for baseline survey and Introduction of the progress e-ACDS for Pilot Testing in Brunei Darussalam, 29 Jan. - 2 Feb. 2017	Report of the meeting: <ul style="list-style-type: none"> <li>- Conclusion on the Key Data Elements (KDEs) for the eACDS on CD and MD parts</li> <li>- List of fish species and fish codes for the system</li> <li>- 1<sup>st</sup> Draft of eACDS supply chains</li> </ul>	<ul style="list-style-type: none"> <li>- Ongoing for developing the eACDS</li> </ul>
<u>Sub-activity 2.1 (ii)</u> Consultation Visit and Introduction of eACDS to DOF/MY	Better understanding on the eACDS process and how importance in combating IUU fishing	<ul style="list-style-type: none"> <li>- Sharing the progress on development of eACDS and basic requirements to implement the eACDS</li> </ul>
<u>Sub-activity 2.1 (iii)</u> 1 <sup>st</sup> Training on Usage of e-ACDS (issuance CD and MD) to all relevant Stakeholder in Brunei Darussalam from 19-21 June 2017, and BN-eACDS Committee Meeting on 22 June 2017	1) Report of 1 <sup>st</sup> Training (Annex 05): <ul style="list-style-type: none"> <li>- Conclusion on the Key Data Elements (KDEs) for the eACDS on CD and MD and ideal of CC parts</li> <li>- Updated List of fish species and fish codes for the eACDS system</li> </ul> 2) Finalize the eACDS flowchart (Annex 06) 3) 1 <sup>st</sup> version of web-application (Annex 07) and 4) 1 <sup>st</sup> version of mobile application (Annex 08) 5) 1 <sup>st</sup> version of Manuals (Annex 09)	<ul style="list-style-type: none"> <li>- Ongoing for developing the eACDS</li> <li>- Stakeholders such as fishery officers, fishermen, fish buyer, processor are trained on the implementation of the eACDS, Web-application including mobile application</li> </ul>
<u>Sub-activity 2.1 (iv)</u> 2 <sup>nd</sup> Training on Usage of e-ACDS (issuance CC) to all relevant Stakeholder and for observers from AMSs in Brunei Darussalam from 17-18 October 2017, and 2 <sup>nd</sup> BN-eACDS Committee Meeting on 19 October 2017	(Will be updated)	(Will be updated)
<u>Sub-activity 2.1 (v)</u> Consultation Visit for Introduction of eACDS to all stakeholders through the collaboration with DOF/VN (will be conducted by end of October 2017)	(Will be updated)	(Will be updated)

Planned activity	Expected outcome/output	Achievements
Sub-activity 2.1 (vi) Consultation Visit and Introduction of eACDS to all stakeholders through the collaboration with xx (tbc) (will be conducted by mid of Nov. 2017)	(Will be updated)	(Will be updated)
Activity 3: Building the awareness and disseminating from the Project outputs		
Sub-activity 3.1: Publicize the results to regional and international forum	- Publication on Infographics on ACDS Guide <700 copies>and VDO on eACDS	
	- Publication on eACDS Manual <700 copies> (tentative by end of DEC 2017)+ VDO on usage of eACDS	
	- Reprint of Publication on Infographics on ACDS Guide <700 copies>and improve details in the VDO on eACDS (tentative by end of DEC 2017)	
	- Publication of ACDS Concept <100 copies> (tentative by end of DEC 2017)	
	- Poster on eACDS	

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

List of completed publications for the year 2015	Type of media	Attached e-file
1) Executive summary report on Regional Initiatives Towards Combating IUU Fishing in the Southeast Asia for 2017	Paper (PDF)	Annex 01a
2) Adoption of the ACDS concept	Paper (PDF)	Annex 01b
3) Summary report of the meeting on PSM	Paper (PDF)	Annex 02
4) Summary report of the meeting of the Animal Committee meeting	PPT (PDF)	Annex 03
5) Summary report of the meeting on the Fish Trade-related issues	Paper (PDF)	Annex 04
6) Report of the 1 <sup>st</sup> Training on Usage of eACDS (issuance CD and MD) to all relevant Stakeholder in Brunei Darussalam from 19 to 21 June 2017, and BN-eACDS Committee Meeting on 22 June 2017	Paper (PDF)	Annex 05
7) Finalize the eACDS flowchart	Paper (PDF)	Annex 06
8) 1 <sup>st</sup> version of web-application	URL	Annex 07
9) 1 <sup>st</sup> version of mobile application	Play Store	Annex 08
10) 1 <sup>st</sup> version of Manuals on eACDS for CC and MD	Paper (PDF)	Annex 09...

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

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

#### 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 2018****1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018**

(Unit: USD)

<b>Proposed Activity</b>	<b>Description of Proposed Activity</b>	<b>Proposed Budget</b>
Activity 1: Monitoring & Enhancing the Capacity on International Fish Trade-related Issues		
Sub-activity 1.1	Review the status of int'l fish trade-related issues	1,500
	i. Draft the executive report on Regional initiatives for 2018-2019	0
	ii. Reviews on the International Fisheries-related Issues and emerging issues	1,500
Sub-activity 1.2	Coordinate with other regional and international organizations	15,500
	i. Participate to international forum <i>e.g.</i> FAO	10,000
	ii. Participate to regional forum:	5,500
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	58,370
	i. Regional Technical Consultation on Fish-Trade related issues	33,000
	ii. Development of the eACDS for Expansion Pilot site/country (3 target countries) including the eACDS for import fishes	25,370
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	5,000
<b>Total budget</b>		<b>80,370</b>

**2. Expected Outcomes/Outputs of Activity for the Year 2018**

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
Activity 1: Monitoring & Enhancing the Capacity on International Fish Trade-related Issues	
Sub-activity 1.1	1) Executive report on Regional initiatives related to Fish trade related issues for 2017-2018
Sub-activity 1.2	2) Enhanced capacity of AMS on international fisheries-related issues or emerging issues
Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations	
Sub-activity 2.1	1) Policy recommendations on the Fish Trade-related issues 2) Adoption of the eACDS for implementation at the Pilot country 3) Development of the eACDS for Import fish
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 2018**

<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												
Activity 3												
Sub-activity 3.1												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

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>Program Thrust:</b>	V	<b>Total Duration:</b>	2013 - 2019
<b>Lead Department:</b>	Secretariat	<b>Lead Country:</b>	Indonesia
<b>Donor/Sponsor:</b>	JTF-VI	<b>Total Donor Budget:</b>	USD 384,000
<b>Project Partner:</b>	None	<b>Budget for 2018:</b>	USD 70,644
<b>Project Leader:</b>	PPC Office, Secretariat	<b>Involved Country:</b>	All ASEAN Member Countries

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

Dealing with international and regional fisheries related issues, which might affect the sustainable development and management of fisheries and aquaculture, it is necessary to strengthen the SEAFDEC network with all ASEAN Member States and between inter-agencies at country levels. This project also aims to monitor and evaluation of overall SEAFDEC programs with the aims to ensure the SEAFDEC activities/programs meet the requirements of the Member Countries. In addition, the project supports the dissemination of the results/outputs from activities/programs through the SEAFDEC quarterly publication 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 strengthened. The regional outputs and publications from SEAFDEC activities could be published/disseminated and shared among Member Countries and among regional and international levels through the quarterly magazine or 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 RFPN and ASEAN higher authority on the results of FCG/ASSP programs	Activity 1.1: Support and strengthen the Regional Fisheries Policy Network (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/ outputs of the project activities are regularly monitored and evaluated	Activity 2.1: Monitor 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 Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	Regional Fisheries Policy Network (RFPN) members are fishery officers from ASEAN Member States who are invited and stationed at SEAFDEC-Secretariat, and to be involved in activities of SEAFDEC especially, in terms of coordination with their own countries.  In this activity, SEAFDEC supports the expenditures of RFPN members' stationing at SEAFDEC/Secretariat as well as business trip to attend related meeting in the region with an aim of enhancing capacity of RFPN Members.
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 Monitor 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 judge the overall value of an endeavor and supply lessons learned to improve future actions, planning and decision-making. Evaluations commonly seek to determine the efficiency, effectiveness, impact, sustainability and the relevance of the project or organization's objectives.
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	10,500
Activity 2:	2.1 Monitor and evaluation of SEAFDEC programs/project activities	16,000	16,000	6,500	2,500	2,000	2,500	2,500
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	9,000
	<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>54,000</b>

## PART II: ACHIEVEMENTS OF 2017 PROJECT IMPLEMENTATION

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

The key achievements of the project implementation for the year 2017 are the continued support and capacity building of the 2 RFPN members from Lao PDR and Viet Nam by this project (no representative from Cambodia for 2017), enhanced the effective management of the SEAFDEC programs through the development of the database system in collaboration with TD. The other achievement is strengthening cooperation with SEAFDEC partnership through the national use of the Training Ship-KOYO Maru of the NFU (National Fisheries University of Japan) to carry out a national survey in Viet Nam waters, under the joint collaboration between SEAFDEC, NFU the Directorate of Fisheries of Viet Nam. In addition, based on the project implementations, 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	-	-	12,745 (On-going)
2) Enhanced 2 RFPN members capacity through participations of ASEAN-SEAFDEC Meetings as follows:	II	2 RFPN members	-	-	-
- Final Seminar for RIHN Project on 15 March 2017 in Bangkok, Thailand					
- Technical Consultation on Development of the ASEAN Common Fisheries Policy on 27-28 March 2017, Bangkok, Thailand					
- In-house Training on Gender Awareness and Gender					

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Mainstreaming in Fisheries by SEAFDEC-TD on 21 April 2017 in Bangkok, Thailand					
- In-house Training on Writing/Editing (April 2017)					
- The 2 <sup>nd</sup> Sub-Regional Technical Meeting on Effective Fisheries Management between Malaysia and Thailand on 25-26 July 2017 in Bangkok, Thailand					
- Regional Technical Consultation on Fishery Statistics and information in Southeast Asia on 15-18 August 2017, Bangkok, Thailand					
Activity 1.2					
1) Consultation visit to research survey participating countries under collaborative arrangements for T/S KOYO Maru Cruise in 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. 15, I &II)	II	-	-	-	4,087 (On-going)
2) Publication on Combating IUU Fishing (On-going)	II	-	-	-	On-going (1,500)
<b>Total Budget Spent till Aug. 17</b>					<b>22,332</b>
<b>Remaining Budget till end Dec. 17</b>					<b>31,668</b>

### 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 Lao PDR and Viet Nam were supported	Strengthened cooperation with ASEAN Member Countries through the RFPNs coordination on the Results of FCG/ASSP program; and building the capacity of RFPNs through their participations to the SEAFDEC forum	Fishery officials from Lao PDR and Viet Nam (2 persons as RFPN members) were stationed at 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

Planned activity	Expected outcome/output	Achievements
		enhanced through the technical writing class (related to fisheries issues) offered by SEAFDEC.  In addition, the Country Profile on Fisheries of 2 countries (Lao PDR and Viet Nam) were compiled and presented by those 2 RFPN members through an assignment given to them.
Activity 1.2		
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. 15, 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 2017	Type of media	Attached e-file
Two (2) volumes of Fish for the People (Vol. 15, 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 act
Activity 1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	
Activity 2.1: Monitor and evaluation of SEAFDEC programs/project activities	
Activity 3.1: Produce and disseminate SEAFDEC special publications	

#### 6. Major Impacts/Issues

1. Collaborative Research under arrangements of NFU's T/S KOYO MARU research/training vessel: Researchers of the Participating countries enhanced their knowledge and skill for conducting marine research/study. At the same time, results from the survey could be used /accommodated with other national relevant information/data to be further used as a basis for improvement of marine capture fisheries in their respective countries. Over the years, a number of countries participated to this collaborative arrangements, including Cambodia, Myanmar, Thailand, and Viet Nam.

## 2. 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.

## 3. 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 2018

### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

		(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	- Continued support the RFPNs for three countries namely Cambodia, Lao PDR and Viet Nam to work and learn on policy development for ASEAN Member States and other management at regional levels	32,000
1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	- Continued enhance the cooperation with AMSs and other SEAFDEC partnership to address the awareness on Fisheries Related Issues and other important issues that might impact to the Region - Continued cooperation with NFU through the use of KOYO Maru to support AMS in conducting the fisheries resources survey in the ASEAN Region (Viet Nam for 2017 -2019), Cancelled for 2017 - Other urgent matter	10,500
2.1 Monitor and evaluation of SEAFDEC programs/ project activities	- Conduct full operation of the SEAFDEC program Database to increase the effectiveness of program management	2,500
3.1 Produce and disseminate SEAFDEC special publications	- Continued publish and dissemination of the Fish for the People, to enhance its visibility to the Member Countries, regional and international arenas	29,845
<b>Total</b>		<b>74,845</b>

### 2. Expected Outcomes/Outputs of Activity for the Year 2018

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	- The reporting of the survey results of 2017 Collaborative Research Survey in Viet Nam waters (the first survey), which to be made through the consultation meeting in 2018 prior to the second survey - Strengthened other cooperation with SEAFDEC Partnership
2.1 Monitor and evaluation of SEAFDEC programs/project activities	- Improved/developed Database system for SEAFDEC Program - Improved monitoring and evaluation system

Proposed Activity	Expected Outcomes/Outputs of Activity
3.1 Produce and disseminate of SEAFDEC special publications	- Published and disseminated 2 volumes of SEAFDEC Publication “Fish For the People” (approx. 3,000 copies)

### 3. Schedule of Activity for the Year 2018

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.1 Support and strengthen the Regional Fisheries 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 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			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 Thrust:</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>	48,000,000 SEK
<b>Project Partner:</b>	ASEAN, BOBLME, CTI-CFF, RPOA-IUU, FAO/APFIC, MRC, UNEP, IUCN/MFF, ILO, USAID	<b>Budget for 2018:</b>	7,000,000 SEK (Approx. 860,000 USD)
<b>Project Leader:</b>	Ms. Pattaratjit Kaewnuratchadasorn	<b>Involved Country:</b>	ASEAN Member States

## PART I: OVERALL PROJECT DESCRIPTION

### 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 has 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 includes 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.

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

**Overall Objectives (Outcomes objectives):** Sustainable use of aquatic resources and reduced vulnerability to climate change by coastal/rural (fishing) communities in the ASEAN region.

- Steps to bridge between output and outcome objectives 1: Implementation of regional and sub-regional aquatic resources management actions by national institutions and organizations
- Steps to bridge between output and outcome objectives 2: Establishment and implementation of regional and sub-regional fisheries and habitat management agreements and action plans.

Three output objectives, namely:

1. Capacity built for integration of habitat & fisheries management and adaptation to climate change
2. Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)
3. Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements

## Outputs, Indicators and Activities

Table 1: Log Frame on Project Follow-up, Monitoring and Evaluation

Outcome objectives	Outputs objectives	Activity as summarized from RAF indicated areas	Key Performance Indicators (Results Assessment Framework (RAF) targets)
Sustainable use of aquatic resources and reduced vulnerability to climate change by 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 illegal fishing	One regional or sub-regional event organized (with partners) where fishing vessel registration, licensing, IUU fishing and labour issues will be discussed involving relevant (two or more) departments with around 60 participants

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>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 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.*

### 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 outputs group, when assessing the results and related outcomes. The present agreement with Sweden under the SEAFDEC-Sweden Project, the period covered, originally, 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 allocation 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 2017, the perspective includes 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.

Support is being provided to processes to strengthen regional cooperation on neritic tuna, fishing capacity, combating IUU fishing and 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, 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 the commitment for the implementation of policies under the ASEAN framework. Among themselves, they have learned to work together as a team with a common regional

perspective and they had successfully built up both strong friendship and strengthened cooperation among ASEAN Member Countries.

#### 4. 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 and 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: Proposed Budget based on activity and sub-activity for 2013-2019

(Unit: Baht)

(Activity Group) Output Objective	Sub-Activity	2013 (actual expenses)	2014 (actual expenses)	2015 (actual expenses)	2016 (actual expenses)	2017 (actual expenses Jan-Sept)	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	3,489,239.23	
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	1,399,479.07	
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	2,164,041.57	
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 Jan-Sept)	2018
4. Administration, personnel and coordination	1. Expenses of Staff, RFPN and administration	2,907,594.53	4,422,775.56	8,528,853.09	7,681,277.11	5,133,844.65	
	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)						
	3. Reporting costs, editing and printing						
	4. Project monitoring and coordination						
	<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>12,186,604.52</b>	<b>7,000,000 SEK</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>0</b>	

Remark: Overhead charge based on actual expenses of each year.

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

### 1. Achievements of the Project Implementation for the Year 2017

The SEAFDEC-Sweden Project has successfully continued to facilitate consultations between ASEAN Member States on ASEAN priority issues in the region and at sub-regional and sub-sub-regional levels. The progress is focused on main thematic areas and cross-cutting issues: Neritic Tuna; Fishing Capacity; gender and labor and working conditions; small-scale fisheries and contracts for local capacity building and gender include the updates on developments in the four target sub-regions: Gulf of Thailand, Andaman Sea; Mekong; and the Sulu-Sulawesi Seas.

#### Output objective 1: 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)**

Following the adoption of the RPOA-Neritic Tuna, the activities have been implemented with gradually strengthened cooperation among countries at regional and sub-regional level. Progress has been reported annually to SEAFDEC Council and the ASWGFi and SOM-AMAF. One of the key elements in the implementation of the RPOA-Neritic Tuna, is the established Scientific Working Group (SWG). They 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 2017 as on-going activities:

- The Population Study on *Thunnus Tonggol* in the Southeast Asian region (1 October 2017-30 September 2018) – on-going
- The progress reported annually at the ASEAN Fisheries Consultative Group and ASWGFi

- The Training/Workshop on Risk Assessments and Fisheries Management Framework/ Measures of Longtail Tuna and Kawakawa in Southeast Asia was conducted on 6-10 August 2017 at SEAFDEC/MFRDMD in Kuala Terengganu, Malaysia
- 4<sup>th</sup> Scientific Working Group on Neritic Tunas will be organized on 7-9 November 2017 by MFRDMD in collaboration with Secretariat

- **Awareness improved and capacity enhanced on Ecosystem-Based Approach to Fisheries Management and cross cutting**

The Project conducted the Ecosystem-Based Approach to Fisheries Management (EAFM) trainings and events through on-site events and by local partners. More than 300 people reached in the target sub-regions (Gulf of Thailand, Andaman Sea and Mekong). Through provided platforms of bilateral events in main 3 target sub-regions, capacity strengthened in support of local management of habitats and fisheries.

- **Management of trans-boundary resources/stocks**

Through the support from the Project, facilitating the dialogue of Gulf of Thailand sub-region, the countries to agree to develop the management plan for 1) Anchovies, 2) Mackerels and 3) Blue Swimming Crab (AIB) around the Gulf of Thailand. This started in 2015-2016 with a series of capacity building were conducted. After that the “Experts Group Meeting on Stock Status and Geographical Distribution of AIB Species in the Gulf of Thailand” was organized in September 2016, and the follow-up meeting was conducted to develop the plan of the stock study for AIB species was organized in February 2017 in order to explore further on development of a joint management plan for AIB species in the Gulf of Thailand based on available information presented in the Meeting in September 2016. The Meeting 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. In this connection, this activity is planned to continue to conduct, in collaboration with Gulf of Thailand countries, the further collection of DNA samples which can be used to get a better understanding of the stock structure of this species.

For Andaman Sea sub-region, the AIB initiative was introduced at the southern Andaman Sea and Andaman Sub-region Meeting find support on sub-regional cooperation of these transboundary resources.

## **Output Objective 2: 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 finally delivered the ASEAN RPOA-Fishing Capacity that is now adopted by ASEAN. Progress of the implementation on the management and control of fishing capacity has been addressed through bilateral dialogues and sub-regional consultations conducted in 2017 with a focus on monitoring catches and landings and to raise awareness on procedures and systems for traceability of fisheries products. Discussions 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.

During 2017, at the 6<sup>th</sup> Meeting of Gulf of Thailand sub-region (Mar 2017) and bilateral consultations between Thailand-Malaysia (July 2017), the countries shared information of the latest laws and legislation related to managing fishing capacity and to reduce IUU fishing, such as license system, procedure of catch landing and inspection of foreign vessel landing across the borders.

In November 2017, the Project conducted the Sub-regional Consultation on MCS in the Gulf of Thailand sub-region, aimed to share information on the national framework of monitoring, control and surveillance and MCS network in the Gulf of Thailand was established. At the Bilateral Meetings (Thailand-Malaysia, Cambodia-Viet Nam and Thailand-Cambodia), the information on legal framework to combat IUU fishing were updated by countries together with the sharing of information on the systems for landing across the boundaries.

Similarly, for the Andaman Sea, the issues regarding the monitoring and control fishing effort and the legal status of fishing operations and catches being landed were shared and discussed between Thailand-Myanmar; and Thailand-Malaysia-Indonesia, respectively.

- **Monitoring of fishing efforts through enhanced traceability of fishery products through the application of an e-ASEAN Catch Documentation Scheme**

An important part of the traceability systems for fisheries products is to verify where the fish has been caught and to be able to strengthen monitoring of fishing effort. The ASEAN Catch Documentation Scheme (ACDS) was endorsed already in 2015 by ASEAN. To further improve the application of the ACDS (both electronic and manual systems), The SEAFDEC-Sweden Project developed an electronic system for the ACDS and it was launched at the 49<sup>th</sup> Meeting of SEAFDEC Council in Brunei Darussalam.

- **Awareness raising on the national laws and regulations (bilateral cooperation)**

The compilation of information on fisheries laws and regulations of Cambodia, Lao PDR and Viet Nam was conducted and the comparative study was completed in December 2016 and the results were subsequently discussed during the Bilateral Workshop on Results of Comparative Study of Laws and Legislations of Cambodia and Lao PDR” and “Bilateral Workshop on Results of Comparative Study of Laws and Legislations of Cambodia and Viet Nam” in December 2016. The participants recognized the importance of the document as basis to define common approaches to improve fisheries management, create a better understanding of the laws and regulations applicable in the each of the two countries, to protect endangered species and to reduce illegal practices. Recommendations were provided on aspects to discuss during next Cambodia – Viet Nam bilateral dialogue - including areas for joint action.

### **Output Objective3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements**

- **Small-scale fisheries, FAO SSF Guidelines**

Since 2014, the “*FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines)*” was adopted, many countries, regional organizations and civil societies organizations have been supporting steps towards the implementation of the SSF Guideline. The basic concepts of the SSF Guidelines is emphasizing on securing sustainable resource use and access rights to tenure and fisheries resources while building upon a human rights-based approach together with an aim to work for gender equity among fisher-folk.

To raise awareness and understand the basic concepts in a regional context, the SEAFDEC-Sweden Project in cooperation with FAO and other partners has continued the process to apply the regional approach through consultations and expert meetings. In September 2017, The Project organized the Experts Workshop on Regional Approach for the implementation of FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries: Human rights-based approach and gender-equitability. The main output of the Workshop was a Policy Brief providing reference to increase understanding and awareness on the principles contained in the SSF Guidelines. The Brief indicates the benefits and implication to the region of building upon a “human-rights based approach” and to ensure “gender equality and equity” in small-scale fisheries.

- **Enhancing Coordination within ASEAN Countries through the Regional Fisheries Policy Network (RFPN) Program**

The program has been ongoing for more than 15 years. Under the present arrangements, five persons are supported by the SEAFDEC-Sweden Project and three persons by the Japanese Trust Fund (JTF). On an annual basis, staffs from fisheries agencies of ASEAN Member Countries are posted at the SEAFDEC Secretariat for a year. RFPN members played 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. The RFPN also supported the efforts of SEAFDEC in developing strategies to promote fisheries policy dialogues, promoting regional and sub-regional cooperation among the Member Countries, and following-up the commitment for the implementation of policies under the ASEAN framework. With the insights of regional policy development, they are more comfortable in proactively support the development of regional and

international cooperation arrangements. In addition, through the network, the communication among the fisheries agencies is easier for them to access directly to the responsible persons and get information from each country when needed.

- **Coordination with other organizations and projects**

The project supported joint activities and coordination with ASEAN, SEAFDEC and several other international and regional organizations 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 “trans-boundary” 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). Among of them, the Project worked closely with Mekong River Commission (MRC), and finally the MOU between SEAFDEC and MRC was signed in July 2017. 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 and Andaman Sea sub-regions as well as the present collaboration on the Gender Study with MFF/SEAFDEC/SEI (2017-2018).

On “Small Scale Fisheries”, the Project coordinated with FAO/Rome, FAO/RAP, Too Big to Ignore (TBTI), ICSF, Kasetsart University of Thailand and Burapha University of Thailand; On “e-ACDS” coordination included the Fish Market Organization of Thailand and on “Labor aspects” the Project coordinated with the International Labour Organization (ILO) as well as a range of national partners.

- **Gender and Social Development**

In 2017, the Project continued to support the SEAFDEC staff for their gender awareness through training at organizational level and project level:

- In-house Intensive Training Workshop on Gender Analysis, 24-26 January 2017
- In-house Training on Gender Sensitivity for SEAFDEC staff and Workshop on Gender Awareness and Gender in Fisheries (for FRPN), in April and May 2017
- Participation Sweden Regional Workshop on Gender for Senior Management level, May 2017
- R&D on Regional Gender Study, in collaboration with Mangrove for the Future and SEI
- Workshop on Gender Analysis using Toolkits for Data collectors, 17-23 September 2017

During the year, SEAFDEC established the Gender Team (Task Force) that now play a key role to work more structures on technical aspects and promotion of gender in SEAFDEC. The Project also recruited new staff to act as “Gender and Social Development Expert” to implement and conduct, gender related activities and also mentoring the SEAFDEC Gender Team.

The Project in collaboration with the Mangroves for the Future (MFF)/IUCN and Stockholm Environment Institute (SEI) is conducting the 2-year Regional Gender Study to improve understanding about the state of women and men in environmental decision making and the structural challenges preventing equitable opportunities for men and women in relation to the participation in coastal and marine, and fisheries sector related activities and decision making and To generate information on current gender related differences in relation to coastal and fisheries resource management, examining the gender dimensions of resource use and natural resource management in selected coastal sites in support with local partners and government officers.

- **Strengthening the sub-regional cooperation through target sub-regions** – Gulf of Thailand, Andaman Sea, Mekong and the Sulu-Sulawesi Seas (*Link to the Output Objective 3*)

Aside from the regional wide perspective, 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, CTI-CFF, USAID/Oceans, etc.

#### - **Gulf of Thailand**

The promotion of strengthened Gulf of Thailand Sub-regional cooperation has been continued. After the 6<sup>th</sup> Meeting of the Gulf of Thailand Sub-region organized in March 2017, bilateral consultations between Thailand-Malaysia, Cambodia-Viet Nam, Thailand-Cambodia were organized as requested follow-up actions to discuss joint approaches for information sharing in support of the management of transboundary fish stocks, the management of fishing capacity, to monitor landings, to initiate MCS networks and to combat illegal fishing.

#### - **Andaman Sea**

The good advancement of cooperation between Thailand and Myanmar is well indicated through the signed MOU between two countries. Thailand and Myanmar have made progress during 2017 in several areas of mutual interest aspects including discussions on management of trans-boundary stocks and in combating IUU fishing.

During the year, updates were provided on the status and progress made on defining the stock status and availability of Neritic Tuna in the Andaman Sea under the ASEAN/SEAFDEC RPOA-Neritic Tuna. Based on the information provided and responses by participants at the Scientific Working Group for Neritic Tuna options could be further explored to develop a specific Andaman Sea Neritic Tuna management plan.

With specific focus, the capacity building on EAFM will be provided to DOF, Thailand to raise awareness at local level on fisheries management in 2017. Capacity-building for local administrations and on alternative livelihoods have continued during 2017 in Kaw Thauang Province, Myanmar through contract with CORIN-Asia, Myanmar.

#### - **Mekong River Basin**

With the collaboration between MRC and SEAFDEC-Sweden Project, finally the Mekong Basin Wide Fisheries Strategy (BWFS) was endorsed in 2017, at the same time MOU between MRC and SEAFDEC was also signed which allowed SEAFDEC and MRC work formally joint cooperation on areas of common interest and in support of a continued regular riparian inter-governmental monitoring of fisheries related matters. The formulation of the implementation of the BWFS would discuss further with the consultation with stakeholders in 2017.

#### - **Sulu-Sulawesi Seas**

With regards to the Sulu-Sulawesi Seas, SEAFDEC has also during 2017 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.

#### ***Support to local capacity-building***

SEAFDEC as an intergovernmental body is not well suited to work at field level but to facilitate local capacity building, to strengthen local organizations, to support improved livelihood opportunities, poverty alleviation and to restore important habitats support is provided through local partners to allow for longer-term engagement at local level. Since 2014-2017, the project has provided support to local capacity

building facilitated by local organizations with the aims of improving livelihood opportunities, undertaking poverty alleviation, and restoring important fishery resources and habitats.

- Through the Learning Institute (LI) with communities and local administration in areas around Tonle Sap and coastal Cambodia including assessments of result of Cambodian fisheries reforms and right-based fisheries.
- Through CORIN-Asia Cambodia with communities and local administrations in Kampot, Kep and Sihanoukville in coastal Cambodia.
- Through CORIN-Asia Myanmar with communities and local administrations in Kawthoung Province in Southeast coastal Myanmar
- Through Sustainable Development Foundation (SDF) of Thailand, with communities and local administrations in Trat Province, Eastern part of the Gulf of Thailand border of Koh Kong Cambodia. The activities started in mid-2016 and will continue to mid-2019.

## 2. Activities Conducted 2017 with the framework of the Current Project:

Table 5: Summary list of activity 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					
Planning Meeting on Development of Stock Study for AIB-Species in the Gulf of Thailand, 7-8 February 2017	T	13	8	-	
Training/Workshop on Risk Assessments and Fisheries Management Framework / Measures of Longtail Tuna and Kawakawa in Southeast Asia, 6-10 August 2017	T	11	17	1	
4 <sup>th</sup> Scientific Working Group on Neritic Tunas, 7-9 November 2017, Kuala Lumpur	P				
Training Course on Essential-Ecosystem Approach to Fisheries Management (E-EAFM), in Ranong, 6-10 November 2017	T				
Output objective 2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)					
Consultation Visit and Introduction of the eACDS for Pilot Testing, 30 Jan-2 Feb 2017	P	-	4	-	
Sub-regional Consultation on the Development of MCS in the Gulf of Thailand, 31 Oct-2 Nov 2017	P				
Output objective 3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements					
6 <sup>th</sup> Meeting of the Gulf of Thailand Sub-region, 28 Feb-2 Mar 2017	P	22	19	13	
2 <sup>nd</sup> Sub-regional Technical Meeting on Effective Fisheries Management between Thailand and Malaysia, 25-26 July 2017	P	16	8	-	
Experts Workshop on Regional Approach for the implementation of FAO Voluntary Guidelines for Securing Sustainable Small-Scale	P	6	11	5	

List of Actual Sub-activity (1)	Type of activity*	Number of Participants			Total Budget Spent (Baht)
		MCs	SEAFDEC+ RFPN	Others organizations	
Fisheries: Human rights-based approach and gender-equitability, 26-28 Sept 2017					
2 <sup>nd</sup> Technical Meeting of the Joint Working Team for Fisheries Management between Cambodia and Viet Nam, 17-18 October 2017	P				
Activity: Participation in the non-SEAFDEC-Sweden events and policy forum					
The 49 <sup>th</sup> Meeting of the SEAFDEC Council, 3-7 April 2001	O				
The 9 <sup>th</sup> Meeting of the ASEAN Fisheries consultative Forum (AFCF) and 25 <sup>th</sup> Meeting of the ASEAN Sectoral Working Group on Fisheries, 15-19 May 2017	O				
Swedish Water Management Conference, 16-17 May 2017	O				
Experts Workshop on Towards a Review of the "Hidden Harvest", 26-29 June 2017	O				
FAO Workshop on Securing sustainable small-scale fisheries: Towards monitoring progress of the implementation of the SSF Guidelines, 5-7 September 2017	O				
USAID workshop	O				
Cat4: Project management and coordination					
1. Expenses of Staff, RFPN and administration, 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) 3. Reporting costs, editing and printing 4. Project monitoring and coordination, project mid-term review (2015) and project evaluation (2019) 5. Operating, equipments and maintenance expenses					

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

Below, the propose activities are just provided for information. The details of the draft Annual Workplan for 2018 will be submitted to the Swedish Embassy for approval by 30 November 2017

Project/Activity Title	Duration	Remarks
To address the components above, expected events to be carried out in 2018:		
1. Continued the process of the collaboration between neighboring countries in 4 sub-regions (Gulf of Thailand,	Jan-Dec	

Project/Activity Title	Duration	Remarks
<p>Andaman Sea, Mekong River, and Sulu-Sulawesi Sea) through the conduct of the bilateral dialogue, sub-regional meetings, Consultation and workshop, etc.</p> <p>2. Regional Cooperation to Promote Sustainable Utilization of Neritic Tuna Resources in Southeast Asia Waters</p> <p>2.1 5<sup>th</sup> Meeting of the Scientific Working Group Meeting on Neritic tuna meeting</p> <p>2.2 Improve data collection for Neritic Tuna focusing tonggol tuna, kawakawa, etc.</p> <p>2.3 Genetic study (will be lead by SEAFDEC/MFRDMD)</p> <p>2.4 Capacity building on EAFM for Neritic Tuna via Training and information dissemination, awareness building: Thailand, Viet Nam, Indonesia, Malaysia, the Philippines</p> <p>3. Field-level work: capacity-building in follow-up to requests from member countries and as recommended during sub-regional consultations.</p>	Jan-Dec	
<p>4. On-site events to be organized in Indonesia, Malaysia, Thailand, Myanmar, Cambodia, Viet Nam, Lao PDR and the Philippines in support of sub-regional dialogue and cooperation in the four target sub-regions.</p>	Jan-Dec	
<p>5. 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.</p>	Jan-Dec	
<p>6. 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).</p> <p><i>Note: Aspects of climate change, gender will be integrated in all outputs groups as a cross-cutting matter to be considered.</i></p>	Jan-Dec	

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

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 Thrust:</b>	Special Activity	<b>Total Duration:</b>	2015 – 2020
<b>Lead Department:</b>	SEC, TD	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	U.S. Agency for International Development (USAID)	<b>Total Donor Budget:</b>	USD 19,953,018
<b>Project Partner:</b>	USAID, SEAFDEC, CTI-CFF	<b>Budget for 2017:</b>	USD \$4,614,596
<b>Project Leader:</b>	Geronimo Silvestre	<b>Involved Country:</b>	ASEAN and CTI-CFF Countries

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

Southeast Asia's fisheries are in a state of overcapacity. Overfishing combined with destructive and illegal, unreported, and unregulated (IUU) fishing practices are causing fisheries to decline, if not collapse, with devastating consequences for regional food security and marine biodiversity.

The goal of the Oceans and Fisheries Partnership (USAID Oceans), a USAID-funded activity implemented by Tetra Tech ARD, is to strengthen regional cooperation to combat IUU fishing, promote sustainable fisheries and conserve marine biodiversity in the Asia-Pacific region. The objectives are to (1) demonstrate a sustainable Catch Documentation and Traceability System (CDTS), (2) expand use of CDTS 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 CDT, (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:

- Developing a transparent and financially sustainable CDTS and complementary Sustainable Fisheries Management Plans (SFMP), tested in at least two fisheries in priority biodiversity areas in the Sulu-Sulawesi Seas.
- Strengthening the capacity of regional, national, and local partners.
- Enhancing fisheries management through EAFM.
- Forging partnerships with the public and private sectors to ensure system uptake and sustainability.
- Cross-cutting incorporation of human welfare considerations into all activities.

Expected outputs of the project for year 2017-2018:

- **Regional Coordination** - Capacity of SEAFDEC, CTI-CFF, and Technical Working Group (TWG) strengthened; Development of Regional CDT Guidelines and Roadmap initiated;
- **CDT** – CDTS developed and implemented in two learning sites with Key Data Elements tested, support provided for implementation and expansion of the SEAFDEC eACDS;
- **EAFM** – Completion of adoption initiated for the Sulu-Sulawesi Seas EAFM Regional Plan and learning site EAFM Plans;
- **Public-Private Partnerships** – Strategic partnerships launched and maintained to support CDTS development, implementation, sustainability, and expansion;
- **Human Welfare** – Gender and labor Key Data Elements integrated into and collected by CDTS, grants awarded to learning site grantees for human welfare interventions, TWG 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.

The Oceans and Fisheries Partnership supports SEAFDEC’s ongoing work to develop and implement the ASEAN Catch Documentation Scheme (ACDS) as well as related national level efforts. Work on the ACDS 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: Develop a financially sustainable regional catch documentation and traceability system (CDTS) to combat IUU fishing and seafood fraud in areas where sustainable fisheries management plans (SFMPs) are being applied	Outcome 1: Overcapacity and IUU fishing in demonstration area fisheries reduced	Output 1: Financially sustainable CDT system with complementary SFMP implemented at 2 learning sites	Activity 1. Regional Support and Engagement to Implement a Financially Sustainable Catch Documentation and Traceability System and Complementary SFMPs in Regional Demonstrations  Activity 2. Support to Philippines and Learning Site of General Santos City  Activity 3. Support to Indonesia and Learning Site of Bitung  Activity 4. Support to Expansion I and II Sites
Objective 2: Expand use of the CDTS to priority biodiversity areas in the Asia Pacific region	Outcome 2: Overcapacity and IUU fishing in expansion areas reduced	Output 2: CDTS with complementary SFMP rolled out in expansion areas/fisheries	
Objective 3: Strengthen human and institutional capacity of regional organizations to conserve marine biodiversity through CDT and SFMPs, including actions to combat IUU fishing and seafood fraud	Outcome 3: Regional and national organizations engaged in and capable of combatting overcapacity and IUU fishing through the use of CDTS and complementary SFMP	Output 3: Trainings and capacity-building regional and national organizations in CDT and SFM planning	

Objective	Outcomes	Outputs	Activities
Objective 4: Enhance public-private partnerships (PPPs) to conserve biodiversity, promote sustainable fisheries management, and combat IUU fishing and seafood fraud	Outcome 4: Private and public sectors engaged in development, implementation and sustainability of CDTS to combat overcapacity and fishing	Output 4: Private and public sector partnership and investments in CDTS and SFMPs	

### 3.2 Overall Scope/Description of Project

Activity	Description
Activity 1. Regional Support and Engagement to Implement a Financially Sustainable Catch Documentation and Traceability System and Complementary SFMPs in Regional Demonstrations	The Oceans and Fisheries Partnership will develop and implement a CDTS consistent with the ACDS, and strengthen sustainable fisheries management in the Sulu-Sulawesi Seas, focusing on two learning sites.
Activity 2. Support to Philippines and Learning Site of General Santos City	The Oceans and Fisheries Partnership will work closely with the Philippines Bureau of Fisheries and Aquatic Resources (BFAR) to develop, implement, and test the CDTS, and implement complementary project objectives, including EAFM, human welfare, and partnership development.
Activity 3. Support to Indonesia and Learning Site of Bitung	The Oceans and Fisheries Partnership will work closely with the Indonesia Ministry of Maritime Affairs and Fisheries (MMAF) to develop, implement, and test the CDTS, and implement complementary project objectives, including EAFM, human welfare, and partnership development.
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. The Oceans and Fisheries Partnership will work with local counterparts to support CDT implementation planning, sustainable fisheries management and human welfare interventions.

### 3.3 Activity, Sub-activity and Proposed Budget

Activities 1-4 represent The Oceans and Fisheries Partnership's 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 and Engagement	Sub-activity 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	656,313	784,481	1,018,290	792,513	140,416
Activity 2. Support to the Philippines and Learning Site of General Santos City	Sub-activity 2.1-6 - Integrated Support for National and Local Activities; Support and Develop Partnerships to Strengthen National and Local Impact; Strengthen Capacity for CDT/Develop and Implement CDTS; Develop Fisheries Management Plan; Integrate Fair Labor and Gender Equity Considerations	1,274,020	1,522,817	1,976,681	1,538,407	272,571
Activity 3. Support to the Indonesia and Learning Site of Bitung	Sub-activity 3.1-6 - Integrated Support for National and Local Activities; Support and Develop Partnerships to Strengthen National and Local Impact; Strengthen Capacity for CDT/Develop and Implement CDTS; Develop Fisheries Management Plan; Integrate Fair Labor and Gender Equity Considerations	1,274,020	1,522,817	1,976,681	1,538,407	272,571
Activity 4. Support to Expansion I and II Sites	Sub-activities 4.1-2 - Providing technical and capacity building support to Expansion sites.	656,313	784,481	1,018,290	792,513	140,416
<b>TOTAL</b>	<b>Total Budget</b>	<b>3,860,667</b>	<b>4,614,596</b>	<b>5,989,943</b>	<b>4,661,839</b>	<b>825,974</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 2017 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*

Objective 1: Develop a financially sustainable regional CDTS to combat IUU fishing and seafood fraud in areas where SFMPs are being applied

- Developed the *Fisheries Catch Documentation and Traceability in Southeast Asia (CDT 201)*, an overview of the technical concept and specifications of the CDTS as a basis for development and proposed design approach.
- Developed the *Data Requirements for Catch Documentation and Traceability in Southeast Asia: Critical Tracking Event and Key Data Element Framework and Glossary (KDE Manual)*, an overview of required and recommended data to be collected by the CDTS

Objective 2: Expand use of the CDTS to priority biodiversity areas in the Asia-Pacific region

- Conducted CDTS Gaps Analysis, completed CDT design of the General Santos City, Philippines learning site, held a series of Development Camps to facilitate internal programming and development of the CDTS interface, and launched the learning site CDTS, September 2017.
- Continued design, development and coordination to further CDTS implementation in the Bitung, Indonesia learning site.
- Conducted CDTS Gaps Analyses and held consultations to initiate upcoming analyses in Thailand, Malaysia and Viet Nam.

Objective 3: Strengthen human and institutional capacity of regional organizations to conserve marine biodiversity through CDT and SFMPs, including actions to combat IUU fishing and seafood fraud

- Convened the second annual Technical Working Group Meeting and Planning Workshop, July 2017, in Bangkok, Thailand.
- Completed Rapid Appraisal of Fisheries Management Systems (RAFMS), Value Chain Analyses, Labor Studies and Gender Analyses in learning sites that will serve as the backbone for EAFM, CDTS design and Human Welfare activities. Conducted research will inform future trainings, planning frameworks, and resources for capacity building activities.
- Initiated the development of SFMPs incorporating CDT and human welfare elements for Sarangani Bay and Sulu Sulawesi Sea in the Philippines and Fisheries Management Area 716 in North Sulawesi Indonesia.
- Convened TWG members and other regional experts for the Regional Gender Workshop and Regional Fisheries Management Planning Workshop in August 2017 to further the advancement of gender objectives and development of a Sulu-Sulawesi Seas Regional Fisheries Management Plan.

Objective 4: Enhance PPPs to conserve biodiversity, promote sustainable fisheries management, and combat IUU fishing and seafood fraud

- Formalized partnerships with nine organizations (to date) to further regional and learning site implementation.
- Awarded grants to fisheries organizations in each of the learning sites to support the further development of and launch of the learning sites' CDTS.
- Engaged with organizations from the public and private sectors to explore potential partnerships and opportunities for collaboration.
- Advanced partnership with Thai Union to continue CDT pilot in Southern Thailand. Lessons learned will inform The Oceans and Fisheries Partnership's CDTS implementation and KDE recommendations.

## 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	
<b>Activity 1</b>					
Sub-activity 1.1: 2 <sup>nd</sup> Annual TWG Meeting and Planning Workshop	T	51	12	2	
Sub-activity 1.2: Regional EAFM Workshop	T	38	19	1	
Sub-activity 1.3: Regional Gender Workshop	T	21	11	11	
Sub-activity 1.4: CDT 201 Development	I	N/A	N/A	N/A	
Sub-activity 1.5: KDE Manual Development	I	N/A	N/A	N/A	
Sub-activity 1.6: Oceans and Fisheries Partnership Web Portal	I	N/A	N/A	N/A	
Sub-activity 1.7: Oceans and Fisheries Partnership eNewsletter	I	N/A	N/A	N/A	
<b>Activity 2</b>					
Sub-activity 2.1: Philippines Stakeholder Consultation Workshop	T	54	9	0	
Sub-activity 2.2: Rapid Appraisal of Fisheries Management Systems (Philippines)	T	16	0	0	
Sub-activity 2.3: Crafting for the Fisheries Component of the Protected Area Management Plan of Sarangani Bay Protected Seascape	T	26	0	0	
Sub-activity 2.4: CDTS Planning and Design Workshop	T	17	0	0	
Sub-activity 2.5: Technical Workshop on CDTS Development	T	8	0	0	
Sub-activity 2.6: Agile Training for Development of the CDTS	T	29	0	0	
Sub-activity 2.7: Exhibition at 19 <sup>th</sup> National Tuna Congress	I	N/A	N/A	N/A	
<b>Activity 3</b>	I				
Sub-activity 3.1: Indonesia Stakeholder Consultation Workshop	T	40	3	0	
<b>Activity 4</b>					
Sub-activity 4.1: Thailand Stakeholder Consultation Workshop	T	56	12	0	

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

Planned activity	Expected outcome/output	Achievements
<b>Activity 1</b>		
Sub-activity 1.1: 2 <sup>nd</sup> Annual TWG Meeting and Planning Workshop	Enhanced coordination, capacity, work plan development	Increased capacity and coordination for Year 3 Work Plan
Sub-activity 1.2: Regional EAFM Workshop	Regional EAFM Plan, Enhanced Capacity	Draft Regional Sustainable Fisheries Management Plans

Planned activity	Expected outcome/output	Achievements
Sub-activity 1.3: Regional Gender Workshop	Enhanced Capacity, Advance Gender Equity and Equality interventions	Enhanced capacity and coordination, progress on advancing Gender equity and equality objectives
Sub-activity 1.4: CDT 201 Development	CDTS Legacy Publication	Established CDTS technical requirements, engaged Technical Advisory Group to conduct expert review
Sub-activity 1.5: KDE Manual Development	CDTS Legacy Publication	Established KDE requirements for CDTS along with complete definitions, engaged Technical Advisory Group to conduct expert review
Sub-activity 1.6: Oceans and Fisheries Partnership Web Portal	External Communications	Development of <i>www.seafdec-oceanspartnership.org</i>
Sub-activity 1.7: The Oceans and Fisheries Partnership eNewsletter	External Communications	Development of <i>Making Waves</i> eNewsletter; two distributions to over 900+ stakeholders
<b>Activity 2</b>		
Sub-activity 2.1: Philippines Stakeholder Consultation Workshop	Stakeholder Engagement	Validation results of learning site studies, increased capacity and coordination, initiated development of Sustainable Fisheries Management Plan
Sub-activity 2.2: Rapid Appraisal of Fisheries Management Systems (Philippines)	Sustainable Fisheries Management	Furthered development of learning site Sustainable Fisheries Management Plan
Sub-activity 2.3: Crafting for the Fisheries Component of the Protected Area Management Plan of Sarangani Bay Protected Seascape		
Sub-activity 2.4: CDTS Planning and Design Workshop	CDTS Development	Development of the CDTS back-end and interface, increased capacity within the Philippines Bureau of Fisheries and Aquatic Resources
Sub-activity 2.5: Technical Workshop on CDTS Development		
Sub-activity 2.6: Agile Training for Development of the CDTS		
Sub-activity 2.7: Exhibition at 19 <sup>th</sup> National Tuna Congress	Stakeholder Engagement	Presented learning site CDTS, increased general awareness of Partnership activities
<b>Activity 3</b>		
Sub-activity 3.1: Indonesia Stakeholder Consultation Workshop	Stakeholder Engagement	Validation results of learning site studies, increased capacity and coordination, initiated development of Sustainable Fisheries Management Plan
<b>Activity 4</b>		
Sub-activity 4.1: Thailand Stakeholder Consultation Workshop	Stakeholder Engagement, CDT Development and EAFM Planning	Engaged stakeholders, furthered development of CDTS planning and development of Sustainable Fisheries Management Plan
Sub-activity 4.2: Viet Nam Country Consultation	Stakeholder Engagement, CDT Development and EAFM Planning	Engaged stakeholders, furthered development of CDTS planning and development of Sustainable Fisheries Management Plan

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

List of completed publications for the year 2017	Type of media	Attached e-file
1. Fisheries Catch Documentation and Traceability in Southeast Asia: Technical Concept and Specifications (CDT 201)	Report	Link
2. Indonesia Value Chain Assessment, Bitung	Report	Link
3. Philippines Value Chain Assessment, General Santos City	Report	Link
4. Philippines Stakeholder Validation Workshop Proceedings	Report	Link
5. Making Waves: Issue 1	Newsletter	Link
6. Making Waves: Issue 2	Newsletter	Link
7. Bitung, Indonesia Learning Site Profile	Factsheet	Link
8. Indonesia Labor Analysis Summary	Factsheet	Link
9. Indonesia Gender Analysis Summary	Factsheet	Link
10. Indonesia Value Chain Analysis Summary	Factsheet	Link
11. Indonesia Fisheries Management Profile Summary	Factsheet	Link
12. Philippines Labor Analysis Summary	Factsheet	Link
13. Philippines Gender Analysis Summary	Factsheet	Link
14. Philippines Value Chain Analysis Summary	Factsheet	Link
15. Philippines Fisheries Management Profile Summary	Factsheet	Link
16. General Santos City, Philippines Learning Site Profile	Factsheet	Link

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

Planned activity	Evaluation/ Views from Participants
<b>Activity 1</b>	
Sub-activity 1.1 – 2 <sup>nd</sup> Annual TWG Meeting and Planning Workshop	Evaluations scored positively, with an average rating of 4.14 (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.*

The Oceans and Fisheries Partnership 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, particularly in Indonesia where the partnership coordinated and successfully signed a Memorandum of Understanding with the Government of Indonesia in February 2017. While this delayed initiation of some site-level activities, the team used this time to continue research and design of the CDTS and complete research to support the CDT, PPP, EAFM, and human welfare workstreams.

The Oceans and Fisheries Partnership 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 and put in place a more efficient structure for 2018 through the completion of the USAID DOI grant process. As such, SEAFDEC and CTI-CFF have now been granted USAID DOI funding to facilitate Expansion Site participation. 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 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
<b>Activity 1. Regional Support and Engagement</b>		<b>\$,1,018,290</b>
Sub-activity 1.1: Support Regional Capacity Building and Coordination	<ul style="list-style-type: none"> <li>- Conduct ongoing regional trainings for program</li> <li>- Engage SEAFDEC and TWG members in regional activities (<i>i.e.</i>, trainings, conferences)</li> <li>- Organize and conduct General Santos, Bitung and Songkhla study tours</li> <li>- Begin development of Regional CDT Guidelines and Roadmap</li> <li>- Conduct 3<sup>rd</sup> Annual Technical Working Group Planning Workshop</li> </ul>	
Sub-activity 1.2: Develop and Implement a Regional PPP and Industry Engagement Strategy	<ul style="list-style-type: none"> <li>- Engage with partner Inmarsat, satellite service provider, to test and pilot mobile satellite solution for data capture at sea</li> <li>- Co-host Regional Technology Conference to support CDTS/FIS/PPP and secure partners for CDTS expansion</li> <li>- Engage buyers, NGOs, and foundations in the US and EU markets by leveraging partnership with Seafood Watch</li> <li>- Support partnership with IPNLF to secure buy-in from key markets, align with national/local markets</li> <li>- Conduct Mid-Term Partnership Portfolio Review</li> <li>- Conduct Technology Partnership Review</li> </ul>	
Sub-activity 1.3: Build Regional Capacity for CDT	<ul style="list-style-type: none"> <li>- Develop CDTS Data Exchange base version</li> <li>- Provide technology support to implementation of SEAFDEC eACDS</li> <li>- Provide support for rollout of SEAFDEC eACDS, to include socialization and software support</li> <li>- Co-host Global Dialogue for Seafood Traceability regional technical workshop</li> </ul>	
Sub-activity 1.4: Support Development of Regional Fisheries Management Plan(s)	<ul style="list-style-type: none"> <li>- Support CTI-CFF RPOA EAFM Goal via development of Regional Sulu-Sulawesi Seas Plan</li> <li>- Conduct Rapid Appraisal for Fisheries Management “2.0” Workshop, Develop Rapid Appraisal Training Module</li> </ul>	
Sub-activity 1.5: Integrate Fair Labor and Gender Equity Considerations at the Regional Level	<ul style="list-style-type: none"> <li>- Participate in the 7th Global Symposium on Gender in Aquaculture and Fisheries</li> <li>- Conduct Regional Gender Workshop in conjunction with 7th Global Symposium</li> <li>- Integrate agenda into CTI-CFF Women Leaders’ Forum in Sustainable Fisheries Management</li> <li>- Participate in Women’s Leadership Forum’s Intergenerational Workshops and Field Visits in Bali, Indonesia, CT6 Sites</li> <li>- Ongoing coordination with SEAFDEC for gender capacity building and policy development</li> </ul>	
Sub-activity 1.6: Implement Regional Communication Strategy	<ul style="list-style-type: none"> <li>- Develop core Legacy Documents across workstreams</li> <li>- Collaborate and support SEAFDEC Information, Education and Communications (IEC) Team</li> <li>- Maintain Activity web portal, hosted by SEAFDEC</li> <li>- Develop program materials, to include fact sheets, event materials, case studies, etc.</li> <li>- Produce videos on key Activity objectives and activities</li> </ul>	

<b>Proposed Activity</b>	<b>Description of Proposed Activity</b>	<b>Proposed Budget</b>
<b>Activity 2. Support to the Philippines and Learning Site of General Santos City</b>		<b>\$1,538,407</b>
Sub-activity 2.1: Integrated Support for National and Local Activities	<ul style="list-style-type: none"> <li>- Conduct annual integrated workshops on lessons learned and best practices with Philippines TWG</li> <li>- Conduct Training of Trainers for integrated training modules (following the development of the Regional CDT Guidelines and Roadmap)</li> <li>- Conduct on-demand/ad hoc training workshops</li> <li>- Develop national and site-level communication materials to support work stream activities</li> </ul>	
Sub-activity 2.2: Support and Develop Partnerships to Strengthen National and Local Impact	<ul style="list-style-type: none"> <li>- Formalize two public-private partnerships with technology companies (FAME and Globe) to support CDTs data capture at sea and landing sites</li> <li>- Support partnership with Socskargen Federation (SFFAI) to support demonstration and expansion of CDTs in target fisheries and supply chains</li> <li>- Develop a partnership to support the expansion of CDTs and fisheries data collection through sustainable business or investment models</li> <li>- Develop a partnership with small-scale association (other than SFFAI) to legitimize supply from small-scale suppliers.</li> </ul>	
Sub-activity 2.3: Strengthen Capacity for CDT/Develop and Implement CDTs	<ul style="list-style-type: none"> <li>- Support Philippines Bureau of Fisheries and Aquatic Resources (BFAR) to develop CDTs</li> <li>- Localize mobile CDTs Minimum Viable Product (MVP) for vessel and supply chain traceability and points of capture through e-logbook and supplier app retrofit</li> <li>- Hire Philippines-based ICT support technical work with BFAR and SFFAI</li> <li>- Procure supporting technology and subscriptions, <i>i.e.</i>, airtime subsidy for at-sea and land-based cellular communications, subscription for VMS communications</li> <li>- Socialize FAME system for small-scale fishers</li> <li>- Development support to modify internal traceability system, Tally-O, for Philippine use</li> <li>- Provide technology support for CDT Operations Center</li> </ul>	
Sub-activity 2.4: Develop Fisheries Management Plan	<ul style="list-style-type: none"> <li>- Finalize Sustainable Fisheries Management Plan (SFMP) for Sarangani Bay in consultation with BFAR, including endorsement and adoption</li> <li>- Monitor Sarangani Bay SFMP implementation</li> <li>- Develop Region 12 SFMP in consultation with BFAR National and Region 12</li> <li>- Conduct “Mainstreaming EAFM Workshop” and EAFM LEAD training to support finalization of Region 12 SFMP</li> </ul>	
Sub-activity 2.5: Integrate Fair Labor and Gender Equity Considerations	<ul style="list-style-type: none"> <li>- Conduct national gender and labor consultation workshops, including participation in BFAR’s Annual Search for Outstanding Women in Fisheries</li> <li>- Implement gender and labor interventions through grants awarded to local women’s group/NGO/Civil Society Organization (CSO)</li> </ul>	
<b>Activity 3. Support to Indonesia and Learning Site of Bitung</b>		<b>\$1,538,407</b>
Sub-activity 3.1: Integrated Support for National and Local Activities	<ul style="list-style-type: none"> <li>- Conduct annual integrated workshops on lessons learned and best practices with Indonesia TWG</li> <li>- Conduct Training of Trainers for integrated training modules (following the development of the Regional CDT Guidelines and Roadmap)</li> </ul>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	<ul style="list-style-type: none"> <li>- Coordinate with and keep TWG apprised of activities through Alliance meetings and quarterly reporting meetings. Hold incidental coordination meetings with MMAF and concerned stakeholders</li> <li>- Conduct bimonthly coordination meetings with local government in Manado and Bitung</li> <li>- Develop national and site-level communication materials to support work stream activities</li> </ul>	
Sub-activity 3.2: Support and Develop Partnerships to Strengthen National and Local Impact	<ul style="list-style-type: none"> <li>- Implement grant with MDPI to pilot CDTS and fisheries management in small-scale tuna fisheries in Bitung</li> <li>- Support partnership with INPLF/AP2HI</li> <li>- Develop partnership with the Indonesia Coastal Tuna Sustainability Alliance (ICTSA) to support CDTS demonstration and expansion, EAFM, and human welfare</li> </ul>	
Sub-activity 3.3: Strengthen Capacity for CDT/Develop and Implement CDTS	<ul style="list-style-type: none"> <li>- Localize national CDT Data Exchange</li> <li>- Support the development, testing, and implementation of MMAF downstream traceability (STSIPP)</li> <li>- Develop mobile CDT Minimum Viable Product for supply chain traceability and point of capture for small-scale (via supplier app)</li> <li>- Hire Indonesia-based ICT staff to support technical work with MMAF, MDPI, Inmarsat</li> <li>- Procure supporting technology and subscriptions, <i>i.e.</i>, airtime subsidy for at-sea and land-based cellular communications, subscription for VMS communications</li> <li>- Support testing and implementation of Point-of-Catch data collection to large- and medium-scale fishing companies, including socialization and training</li> <li>- Link CDTS data with national fisheries information system(s) to support stock assessment for fisheries management</li> <li>- Provide technology support for CDT Operations Center</li> </ul>	
Sub-activity 3.4: Develop Fisheries Management Plan	<ul style="list-style-type: none"> <li>- Finalize Sustainable Fisheries Management Plan (SFMP) for learning site</li> <li>- Develop methodology to support adoption and implementation of SFMP</li> <li>- Conduct meetings with Indonesia TWG to support adoption and implementation of SFMP</li> </ul>	
Sub-activity 3.5: Integrate Fair Labor and Gender Equity Considerations	<ul style="list-style-type: none"> <li>- Conduct national gender and labor consultation workshops, including participation in BFAR's Annual Search for Outstanding Women in Fisheries</li> <li>- Implement gender and labor interventions through grants awarded to local women's group/NGO/ Civil Society Organization (CSO)</li> </ul>	
<b>Activity 4. Support to Expansion I and II Sites</b>		<b>\$,1,018,290</b>
Sub-activity 4.1: Support Expansion I Sites	<ul style="list-style-type: none"> <li>- Finalize Songkhla, Thailand Site Profile</li> <li>- Conduct Kelantan, Malaysia Stakeholder Consultation Workshop, Finalize Site Profile</li> <li>- Support TWG representatives to national/site-level trainings and workshops</li> <li>- Facilitate CDT learning exchanges between learning and expansion sites</li> <li>- Engage industry associations and initiatives, such as</li> </ul>	

<b>Proposed Activity</b>	<b>Description of Proposed Activity</b>	<b>Proposed Budget</b>
	<p>Mars Petcare, to support CDTS expansion to Thailand</p> <ul style="list-style-type: none"> <li>- Conduct Thailand and Malaysia Partnership Appraisals</li> <li>- Conduct CDT study and workshop to develop CDT Roadmap in Thailand and Malaysia, provide technical assistance</li> <li>- Develop and test core CDTS application with Thai Union for in-field data capture</li> <li>- Provide software, training, and documentation on Data Exchange server; provide mobile demo unit; CDT apps</li> <li>- Provide technical support for EAFM planning</li> <li>- Facilitate networking among women leaders via the human welfare TWG</li> </ul>	
Sub-activity 4.2: Support Expansion 2 Sites	<ul style="list-style-type: none"> <li>- Develop Site Profile template</li> <li>- Support TWG representatives to national/site-level trainings and workshops.</li> <li>- Conduct Viet Nam Partnership Appraisal</li> <li>- Conduct Viet Nam study and workshop to develop CDT Roadmap</li> <li>- Provide technical assistance</li> <li>- Provide CDT mentorship</li> <li>- Provide software, training, and documentation on Data Exchange server; provide mobile demo unit; CDT apps</li> <li>- Provide technical support for EAFM planning</li> <li>- Facilitate networking among women leaders via the human welfare TWG</li> </ul>	

## 2. Expected Outcomes/Outputs of Activity for the Year 2018

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
<b>Activity 1. Regional Support and Engagement</b>	
Sub-activity 1.1: Support Regional Capacity Building and Coordination	<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>- Enhanced capacity for CDT planning and implementation via learning site study tours</li> <li>- Program learnings, best practices and thought leadership captured in Regional CDT Guidelines and Roadmap to facilitate regional CDTS expansion, adoption and sustainability</li> </ul>
Sub-activity 1.2: Develop and Implement a Regional PPP and Industry Engagement Strategy	<ul style="list-style-type: none"> <li>- Enhanced at-sea connectivity, data capture and transmission through Inmarsat technology solutions</li> <li>- International and regional engagement on CDT initiatives to further dialogue on CDT architecture and data standards</li> <li>- Additional engagement with buyers, NGOs, and foundations in the US and EU markets, resulting in increased alignment with national/local markets</li> <li>- Realigned partnership strategy with clear program-end goals</li> </ul>
Sub-activity 1.3: Build Regional Capacity for CDT	<ul style="list-style-type: none"> <li>- Established CDTS Data Exchange base version to facilitate regional adoption and customization</li> <li>- Enhanced and socialized SEAFDEC eACDS</li> </ul>
Sub-activity 1.4: Support Development of Regional Fisheries Management Plan(s)	<ul style="list-style-type: none"> <li>- Regional Sulu-Sulawesi Seas Plan developed and adoption initiated</li> <li>- Rapid Appraisal for Fisheries Management Training Module updated and capacity enhanced for methodologies</li> </ul>
Sub-activity 1.5: Integrate	<ul style="list-style-type: none"> <li>- Human welfare, gender goals and objectives defined for regional adoption</li> </ul>

<b>Proposed Activity</b>	<b>Expected Outcomes/Outputs of Activity</b>
Fair Labor and Gender Equity Considerations at the Regional Level	<ul style="list-style-type: none"> <li>- Key Data Elements for human welfare and gender integrated into the CDTS</li> <li>- Human welfare and gender considerations integrated in the Sulu-Sulawesi Seas EAFM Regional Plan and learning site SFMPs</li> <li>- Women Leaders' Forum/Network for Sustainable Fisheries Management established and/or strengthened (particularly amongst CTI-CFF member countries)</li> </ul>
Sub-activity 1.6: Implement Regional Communication Strategy	<ul style="list-style-type: none"> <li>- Programmatic and learning site activities, best practices communicated to key stakeholders</li> <li>- Program learnings documented through core Legacy Documents across workstreams</li> </ul>
<b>Activity 2– Support to the Philippines and Learning Site of General Santos City</b>	
Sub-activity 2.1: Integrated Support for National and Local Activities	<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, industry and regional counterparts</li> </ul>
Sub-activity 2.2: Support and Develop Partnerships to Strengthen National and Local Impact	<ul style="list-style-type: none"> <li>- 8 non-government (industry and NGO) stakeholders investing in the implementation of CDTS in the Philippines</li> <li>- Industry-Government collaboration on CDTS strengthened in the Philippines</li> <li>- Partnership developed to support the replication and expansion of CDTS to other countries, fisheries, and supply chains</li> </ul>
Sub-activity 2.3: Strengthen Capacity for CDT/Develop and Implement CDTS	<ul style="list-style-type: none"> <li>- BFAR CDTS developed, tested and deployed in the learning site.</li> <li>- Point of catch data collection for medium and large-scale fisheries deployed</li> <li>- First mile data collection for small and medium scale developed and deployed</li> <li>- Private sector CDTS components tested and deployed</li> <li>- Early mover companies able to meet US and EU traceability data requirements</li> </ul>
Sub-activity 2.4: Develop Fisheries Management Plan	<ul style="list-style-type: none"> <li>- General Santos learning site SFMP completed and adoption process initiated/completed</li> <li>- Rapid appraisal using RAFMS training modules developed.</li> <li>- Strengthened national and local capacity for EAFM</li> </ul>
Sub-activity 2.5: Integrate Fair Labor and Gender Equity Considerations	<ul style="list-style-type: none"> <li>- National activities events leveraged to increase capacity and advance gender and labor objectives</li> <li>- Policy recommendations and draft legal instruments developed, put forward or adopted that address gender and labor considerations in fisheries</li> <li>- Grant partnership developed and implemented that address gender intervention priorities identified in gender analyses</li> <li>- Women leaders in sustainable fisheries management are identified and engaged</li> </ul>
<b>Activity 3. Support to Indonesia and Learning Site of Bitung</b>	
Sub-activity 3.1: Integrated Support for National and Local Activities	<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, industry and regional counterparts</li> </ul>
Sub-activity 3.2: Support and Develop Partnerships to Strengthen National and Local Impact	<ul style="list-style-type: none"> <li>- 5 non-government (industry and NGO) stakeholders investing in the implementation of CDTS in Indonesia.</li> <li>- Industry-Government collaboration on CDTS strengthened in Indonesia</li> <li>- Capacity built amongst industry associations and NGOs in Indonesia</li> <li>- Partnership developed to support the replication and expansion of CDTS to other countries, fisheries, and supply chains</li> </ul>
Sub-activity 3.3: Strengthen Capacity for CDT/Develop and Implement CDTS	<ul style="list-style-type: none"> <li>- MMAF downstream CDTS (STSIPP) developed, tested and operationalized with USAID Oceans' support</li> <li>- CDTS interoperability established with MMAF's internal traceability systems: upstream (eLogbook, SHTI) and downstream (STSIPP)</li> <li>- Point of catch data collection for medium and large-scale fisheries</li> </ul>

Proposed Activity	Expected Outcomes/Outputs of Activity
	<ul style="list-style-type: none"> <li>developed, deployed and expanded to new users</li> <li>- First mile data collection for small and medium scale developed, deployed and expanded to new users</li> <li>- Internal electronic traceability system launched for fishery processing companies to enable participation in the larger traceability chain</li> <li>- Early mover companies able to collect data to comply with various country import requirements</li> </ul>
Sub-activity 3.4: Develop Fisheries Management Plan	<ul style="list-style-type: none"> <li>- Bitung learning site SFMP completed and adoption process initiated/completed</li> <li>- Rapid appraisal training modules developed</li> <li>- National and local capacity for EAFM strengthened</li> </ul>
Sub-activity 3.5: Integrate Fair Labor and Gender Equity Considerations	<ul style="list-style-type: none"> <li>- National activities events leveraged to increase capacity and advance gender and labor objectives</li> <li>- Policy recommendations and draft legal instruments developed, put forward or adopted that address gender and labor considerations in fisheries</li> <li>- Grant partnership developed and implemented to address gender intervention priorities identified in gender analyses.</li> <li>- Collaboration with Coral Triangle Center and Women’s Leadership Forum strengthened</li> <li>- Women leaders in sustainable fisheries management are identified and engaged</li> </ul>
<b>Activity 4. Support to Expansion I and II Sites</b>	
Sub-activity 4.1: Support Expansion I Sites	<ul style="list-style-type: none"> <li>- TWG counterparts and relevant stakeholders engaged through increased coordination and conduct of Stakeholder Consultation Workshops</li> <li>- Site Profiles finalized to facilitate CDT, EAFM and partnership planning efforts</li> <li>- Enhanced capacity across workstreams through Stakeholder Consultation Workshops and participation in learning site study tours</li> <li>- Completed Partnership Appraisals and CDT Gaps Analyses to catalyze planning and implementation efforts</li> <li>- Increased capacity for human welfare planning, interventions and strengthened TWG networks</li> </ul>
Sub-activity 4.2: Support Expansion 2 Sites	<ul style="list-style-type: none"> <li>- TWG counterparts and relevant stakeholders engaged through increased coordination, participation in learning site study tours, and technical assistance</li> <li>- Site Profiles developed to facilitate CDT, EAFM and partnership planning efforts</li> <li>- Increased capacity for human welfare planning, interventions and strengthened TWG networks</li> </ul>

### 3. Schedule of Activity for the Year 2018

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Activity 1. Regional Support and Engagement</b>												
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)												

<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>
Sub-activity 1.5: Integrate Fair Labor and Gender Equity Considerations at the Regional Level												
Sub-activity 1.6: Implement Regional Communication Strategy												
<b>Activity 2. Support to the Philippines and Learning Site of General Santos City</b>												
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												
<b>Activity 3. Support to Indonesia and Learning Site of Bitung</b>												
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												

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2017  
AND  
PROPOSED ACTIVITY FOR YEAR 2018**

			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>Program Thrust:</b>		<b>Total Duration:</b>	2017(August)-2019(July)
<b>Lead Department:</b>	SEAFDEC Secretariat	<b>Lead Country:</b>	Indonesia
<b>Donor/Sponsor:</b>	JAIF	<b>Total Donor Budget:</b>	USD 842,852.80
<b>Project Partner:</b>	AMSs	<b>Budget for 2018:</b>	USD450,081.40
<b>Project Leader:</b>	Project manager /SEC	<b>Involved Country:</b>	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	Indicator 1: Main factors that drop the survival rate of juvenile eels are identified

Objective	Outputs	Activities	Indicator
		seeds, handling methods, transportation methods, water condition, feed for initial seedling, and the other possible causes/reasons that might affect the survival of juvenile anguillid eels.	and consolidated, Indicator 2: 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 of starting) anguillid eel fishery.</p>

Activity	Description
	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.
Sub-activity 1.3: Strengthening the statistical information collection system on anguillid eel farming production at each species.	<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>
Sub-activity 1.4: Developing the decisive method of species identification of juvenile anguillid eels with latest DNA fingerprint techniques.	<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>
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 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	

Activity	Description
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	To conduct three different meetings, which include: <ol 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> </ol>

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

(Unit: USD)

Activity	Y1	Y2
	2017(August)-2018(July)	2018(August)-2019(July)
Activity 1:	189,200	117,206
Activity 2:	71,834	56,934
Activity 3:	127,025	156,609
Common expense	36,000	36,000
Contingency		52,044

## PART II: ACHIEVEMENT OF 2017 PROJECT IMPLEMENTATION

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

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 December 2017 are as follows:

#### Activity 1 (Statistical survey)

##### - Statistical survey

The statistical survey was conducted to grasp the utilization situation of Anguillid eel resources, which is Catadromous eel in the ASEAN region.

Statistical surveys (catch statistics survey, aquaculture statistics survey) were conducted in the five countries (Cambodia, Indonesia, Myanmar, Philippines, Viet Nam) out of 10 AMSs where Anguillid eel fishery is existing.

We selected one site of major river in each of the five countries, designed a survey to collect the catch through the Consolidator of Anguillid eel every month, and collected catch data.

#### Activity 2 (Survival rate survey)

Survey to improve the survival rate of glass eel has been started by cultivating the glass eel caught on Luzon Island in Philippines. This year, we will examine the influence of food type on survival rate.

- 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

#### Activity 3

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

The meeting comforted appointing the contact person and Person in charge on eel, gathered information on eel fishery and presented status on resources management in five Countries (Cambodia, Indonesia, Myanmar, Philippines and Viet Nam).

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

In this meeting the external committee evaluates/review the result of statistical survey, survival rate survey in the project

## 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	13	32	5	
Activity 2	III	2	2		
Activity 3	IV	34	39	10	

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

Planned activity	Expected outcome/output	Achievements
Activity 1	The statistical data collection system is strengthened in AMS to better understand the present status and past/future trends on tropical Anguillid eels at each species and stage.	Implementation of data collection statistical survey on catch and aquaculture production of Anguillid eel in ASEAN five 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.
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. Major Impacts/Issues

1. We conducted statistical survey (catch statistics, aquaculture production statistics) for five countries where Anguillid eel fishery is existing, and developed data collection methods and routes in each country to grasp utilization status of Anguillid eel resources.
2. Survival survey was started for the tropical Anguillid eel in Luzon and Mindanao island in Philippines
3. We began to examine the management strategies of the tropical Anguillid eel resources of the AMSs.
4. It is necessary to formulate management policy based on the resource situation of Anguillid eel of AMSs.

### PART III: PROPOSED ACTIVITIES FOR YEAR 2018

#### 1. Proposed Activity/Sub-activity, Work Plan and Estimated Budget for the Year 2018

(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 and species composition of Anguillid eel.</li> </ul>	
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>	
Activity 3	<ul style="list-style-type: none"> <li>- To hold "Regional Meeting" where ASEAN countries and international organizations participate.</li> <li>- To hold "Assessment committee meeting" to evaluate the findings of the project</li> <li>- To hold "Resources management workshop" to examine resource management measure of Anguillid eel in AMSs.</li> </ul>	

#### 2. Expected Outcomes/Outputs of Activity for the Year 2018

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 2018

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

## Annex 6

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES FOR THE YEAR 2017-2018****I. Aquaculture Department (Appendix 1)**

<b>Project Title</b>	<b>2017</b>	<b>2018</b>	<b>Appendix No.</b>
1. Quality Seed for Sustainable Aquaculture	Y	Y	2
2. Healthy and Wholesome Aquaculture	Y	Y	3
3. Maintaining Environmental Integrity through Responsible Aquaculture	Y	Y	4
4. Adapting to Climate Change Impacts	Y	Y	5
5. Meeting Socio-economic Challenges in Aquaculture	Y	Y	6

**II. Training Department**

<b>Project Title</b>	<b>2017</b>	<b>2018</b>	<b>Appendix No.</b>
6. Promotion on Strengthening of SEAFDEC Visibility and Image	Y	Y	7
7. Tailor-made Training Programs	Y	Y	8
8. Improvement of Fisheries Technology and Reduction of the Impact from Fishing	Y	Y	9

Y = Program implemented during the year

**SEAFDEC Departmental Programs for the Year 2016-2017****AQUACULTURE DEPARTMENT****OVERALL REVIEW****1. Quality Seed for Sustainable Aquaculture**

The program focuses on studies and activities that determine optimal conditions and methods to produce quality seedstock in sufficient quantities.

- *Development of good quality broodstock and implementation of proper stock management protocols*

On marker-assisted broodstock development and management, six microsatellite or short tandem repeat (STR) DNA markers were used to characterize the existing AQD abalone hatchery stock and nine wild stocks for broodstock genetic assessment. Agusan del Norte (Mindanao) and Palawan (Luzon) stocks had the highest variability based on the number of alleles ( $A = 17.8$  and  $15.5$ ) and expected heterozygosity ( $H_{exp} = 0.861$  and  $0.901$ ) suggesting they are potentially better or more fit/adaptable. Meanwhile, on the reproductive efficiency comparison, the AQD hatchery-bred abalone stocks had the highest number of eggs as well as the number of eggs per gram body weight female. This information and those obtained from the molecular marker variation assessment shall be used in the formulation of a broodstock management and selective breeding scheme for the donkey's ear abalone.

Genetic characterization of *Scylla serrata* stocks based on three novel and three existing STR markers is also being done to maintain high genetic variability and check for the negative impacts of domestication in several generations of selected and control stocks from Camarines and Surigao Provinces in the Philippines. Raw data based on uncorrected estimates of the number of alleles ( $A$ ) showed that the parental stocks from Camarines and Surigao had higher number of alleles while batches from the first generations of the Camarines and Surigao control stocks had lower. Slightly lower  $A$  estimates were noted in the first-generation selected stocks from Camarines ( $6.17$  and  $6.5$ ) and Surigao ( $4.0$ ). Expected heterozygosity estimates were not significantly different between the stocks and across generations based on the existing batches screened. Molecular marker data are being correlated with parameters for selected beneficial traits to determine if the markers could be used as preliminary indicators of genetic improvement.

In another study, incorporation of vitamin C in the shrimp broodstock diet reduced incidence of mortalities in domesticated shrimp broodstock. When young postlarval stages (for ongrowing to potential broodstock size) were fed 2% taurine, mass weight was significantly higher compared to treatments with lower taurine levels. In comparing reproductive performance of spawners reared in pens against those grown in tanks, tank-reared stocks resulted in maturation until stage 2 but no stocks matured in the pens.

Preliminary information on the development of an appropriate diet to improve breeding performance and larval quality in sandfish *Holothuria scabra* imply that that sandfish may require only low dietary levels of both protein and lipid, and that high lipid content may be unfavorable to growth (though not necessarily to maturation).

The Program also reports, as requested by the 39<sup>th</sup> PCM on the study "Appropriate Transport and Acclimation Strategies of Sea horses," that adult seahorses were transported at stocking density of 1 ind/L have 100% survival after 10 hours transport using oxygenated plastic bags filled with seawater packed in styrobox. Nylon twines tied to lead sinkers served as holdfast for seahorses. Trials on transport and acclimation of juvenile seahorses showed optimum stocking density of 3 ind/L at 10 to 12 hours transport duration using the same transport protocol.

- *Refinement of hatchery and nursery management methods to improve seedstock quality and production*

Abalone studies have been done to determine the effectiveness of using chemical cues (positive ions, algal extracts) to improve settlement rate, increase production of juveniles through improved culture techniques. Moreover, efficient sorting and harvesting protocols using muscle relaxant to improve survival rate of abalone juveniles were developed. After 120 h, larvae exposed to Control (0 M serotonin) induced a settlement rate of 8.33%, while the remaining test concentrations showed no inductive effect regardless of settlement substrate. In determining the effectiveness of using algal cues as settlement inducer, the use of agar-bound microparticulate diet + 0.1 mM NH<sub>4</sub>Cl consistently showed higher settlement rate. Trials were also made on the application of potential chemical cues (NH<sub>4</sub>Cl, GABA and serotonin) in bigger tanks. Highest settlement rate of 4.49±0.38% was attained after 5 d, while settlement after 10 d was 1.95±0.23%.

The larval rearing protocol for the blue swimming crab focused on the refinement of feeding and water management strategies to increase the survival rate of the megalopa from 3-5% to 6-10% and crab instar. First, a technique to determine larval quality in the blue swimming crab was established using the formalin stress test (30-minute formalin exposure of newly hatched zoea to distinguish good from poor quality larvae). The method is being promoted for use in hatcheries to ensure that the larvae being reared further are only the good quality larvae to ensure higher seedstock yield. Apart from this, trials on the use and non-use of antibacterial agents and its effect on the crab larvae were conducted. Results showed that those without antibiotics survived but the rate was lower than the batches with the antibacterial agents. Mass production of crablets was likewise pursued under the project. The protocols for hatchery and nursery-rearing of the blue swimming crab are being optimized. Crab instar 1-2 have been shown to tolerate salinities of 16-32 ppt. Later stages (stocked at C3) showed tolerance to 8-20 ppt, but higher survival was achieved at 16-32 ppt. Crab molting interval and increments were similar in all salinities from 16-32 ppt. Also, the optimal stocking density for the blue swimming crab during the second nursery rearing phase in hapas within pens was established at 10-15 individuals/m<sup>2</sup>.

- *Promotion of technically and economically viable breeding and seed production schemes*

Tilapia seed production to date (September 2017), about 92,740pcs of fry and 46,377 pcs of A-net-size seedstock were harvested from the tanks used for production of seeds meant for grow-out while 45,154 fry and 18,381 A-net-size seedstock were obtained from the tank for potential broodstock production and development. On prawn seedstock production, data seven months from initial stocking recorded about 170,280 hatchlings harvested for on-growing to post larvae. Finally, based on the most recent (eight) sampling schedule, 25,060 hatchlings were obtained thus far and three berried females have yet to spawn. On abalone juvenile production, from September 2016 to August 2017, a total of 68,503 abalone juveniles (5mm – 8mm SL) were harvested with an average survival rate of 0.60% (rates ranging from 0.09% to 1.66%).

- *Other studies*

The use of algal paste in rotifer cultures for mangrove crab seed production was evaluated. Initially, *Nanochlorum* paste was used in rotifer culture but *Tetraselmis* paste proved to be a better option.

On the potential of locally-available microalgal strains as food for the minute monogont rotifer, *Proales similis* de Beauchamp, the biochemical, proximate and cost of production of *C. sorokiniana* was established. Semi-batch culture trials show lower cost of *C. sorokiniana* paste production is achievable. *P. similis* can tolerate high salinity (30ppt) but better results are obtained if acclimatization is done prior feeding with the algae.

In the development of protocols for the transport of milkfish *Chanos chanos* juveniles, preliminary findings show that survival of milkfish juveniles a week after being transported for 4 to 6 hours at 25°C regardless of salinity levels (0 to 20 ppt) still attained high survival (94 -100%). Transporting milkfish juveniles at 25 °C under higher salinities could still result in good survival. Prolonging the transport time to 12 hours does not have any adverse effect on the juveniles.

## 2. Healthy and Wholesome Aquaculture

- *Find effective alternative protein sources to fish meal and fish oil in dietary formulations*

For tilapia larvae, grouper fingerlings and abalone, feeding experiments are ongoing including the study on amino acids required by sea bass growth. Currently, the amount of crude fat in the mass-produced thraustochytrid was still low (1.8-2.8%), hence, isolates were prepared in petri dishes with the aim to increase crude fat content of the algae. Results showed that crude fat in the isolates was high at a level of 20%.

On the request by the 39<sup>th</sup> PCM to share the result from the study on “Use of Plant-based Protein Source in Tilapia Feeds for Improved Production Traits,” breeding trials showed that fishmeal substitution with mango peel silage up to 50% level increased fry production but resulted in reduced weight gain of tilapia breeders after 42 weeks. Further monitoring of growth and reproductive performance of tilapia breeders in both tank and cage set-up shall be done. Preparations for the laboratory feeding trials to evaluate the effect of dietary supplementation of selected agricultural by-products on performance of tilapia fingerlings are on-going. Bacterial inoculation or treatment of selected agricultural by-products is also being done.

- *Promote practices and strategies in nutrition to improve production*

Postlarvae of *P. indicus* were successfully produced in the hatchery and stocked for grow-out culture. Better performance was noted in shrimp fed commercial diet low in crude protein content (40%) which will be verified in another run. Male with sperm and mated female were noticeable during harvest and could be sources of breeders.

- *Testing the efficacy of indigenous probiotics*

The protective effects of *Bacillus* sp. JL47 containing different levels of amorphous Poly-  $\beta$ -hydroxybutyrate (PHB) in a model culture system using gnotobiotic *Artemia* were examined. Results showed that *Artemia* nauplii fed the *Bacillus* sp. JL47 containing 55% PHB attained a significantly higher survival than those *Artemia* fed the *Bacillus* sp. JL47 containing 29% PHB. Moreover, a complete protection against pathogenic *V. campbellii* was observed in *Artemia* fed the *Bacillus* sp. JL47 containing 55% PHB since no significant difference was observed between this treatment and the non-challenged control. The data suggest that, the protective effects of *Bacillus* sp. JL47 is superior when it contains higher amount of amorphous PHB and that the amorphous PHB is suggested to be a main determinant in the protective effect of the *Bacillus* sp. JL47.

In another study, *P. monodon* fed shrimp diet supplemented with PHB-accumulating *Bacillus* sp. JL47 and subsequently challenged with *V. parahaemolyticus* showed higher survival (52.5% survival) compared with the control (16.7% survival) at 21 DOC although survival in all treatments was very low in shrimps challenged after 7 (0% survival in all treatments), 14 (control: 0% survival; JL47: 0.83% survival) and 30 days (control: 16.7% survival; JL47: 14.8% survival).

- *Rationalize the need and application of diagnostics that will ensure biosecurity within culture systems*

In determining the microbial quality of oysters grown major production sites in Capiz province, Philippines, it was found that the monthly coliform count in the water samples collected from all sampling stations were generally high ( $\leq 540$  MPN/100 ml) regardless of the sampling period (wet or dry season). Similarly, the monthly *E. coli* count in oysters' meat and intervalvular fluid were typically high (330~24,000 MPN/100 g) particularly during the warm dry months of the year. *V. cholerae* was not detected in any of the oyster samples examined while *V. parahaemolyticus* count was within acceptable range. *Salmonella* was erratically detected in oysters collected from all sampling stations examined. Relaying oysters in an approved area in was likewise attempted resulting in a drop in *E. coli* count in contaminated oysters from 24,000 MPN/ 100g to  $\leq 20$  MPN/ 100g after 2 weeks of relaying, suggesting the practicality of this technique in rendering raw oysters safe for human consumption.

- *Other activities*

To involve other member countries as requested during the 39<sup>th</sup> PCM, in activities on the establishment of protective measures against persistent and emerging parasitic diseases of tropical fish, epidemiology of the EMS/APHND, technology extension and demonstration, sharing information, AQD has proposed, alongside DOF-Thailand, to ASEAN-JAIF for the ‘ASEAN Regional Technical Consultation on Aquatic Emergency Preparedness and Response Systems for Effective Management of Transboundary Disease Outbreaks in Southeast Asia.’ The proposal is currently under the appraisal and approval process. Further, this Consultation is anticipated to be one of the major activities of ANAAHC for 2018 as this activity will be participated by ANAAHC country focal points. AQD was invited as speaker/expert during the 1st Pilot Testing of the Standard Operating procedures for responsible movement of live aquatic animals for ASEAN. AQD provided expert's opinion and pertinent inputs.

On the 39<sup>th</sup> PCM's request to continue conducting training courses in Myanmar on fish health management, a training is in the pipeline to focus on marine fish bacteriology. This is in line with AQD's commitment to substantially assist not only in terms of human capacity building but also on the establishment of the Bacteriology Section of the National Fish Health Laboratory of Myanmar. Part of the training will also involve lectures on Antimicrobial resistance in collaboration with NACA.

### **3. Maintaining Environmental Integrity through Responsible Aquaculture**

- *Develop and promote efficient and suitable environment-friendly culture systems*

Abalone are best cultured in PVC pipes in both tank and reef flat. In both culture environments abalone performed best at 200 pcs/m<sup>2</sup> stocking density based on results of the last experiments conducted. The project was able to establish an efficient culture system for the species.

On culture trials for sandfish *Holothuria scabra* in ponds and sea ranch, a project evaluation workshop was held in Concepcion, Iloilo in March 2017 participated by stakeholder groups. Project performance rating was high in terms of “Environment improvement: by all groups with a score of 8.0 to 9.0 (for a maximum possible score of 10). Likewise, a high rating was received in the “Increase in fisheries stocks” from the local government and community groups (9.75-10) but were rated lower by the Academe group (7.6). “Community Participation” and “Government Support” also had some of the low rating of 7.4 and 6.8, respectively, by the Academe group, indicating that more focus on social linkages need to be developed in future engagements.

On the use of a biofloc system for giant freshwater prawn culture, no significant differences in mean weight, daily growth rate and specific growth rates was observed among the three stocking densities tested (30, 40 and 60 prawns per 1-ton tank) after 6 months of culture. However, survival was significantly different among treatments with highest survival at the lowest stocking density and lowest survival at the highest stocking density. On the multiphase strategy for the grow-out culture of giant freshwater prawn, mean weight of prawns was inversely proportional to the stocking density.

To demonstrate the technology for production of *K. alvarezii*, a 2-day on-site training for seaweed farmers from Batbatan Island, Culasi, Antique Province was conducted. Trainees were composed of 30 seaweed farmers. Topics on grow-out culture, common diseases, and updates on *Kappaphycus* culture were discussed. An open forum was also conducted right after the lectures. On the 2nd day, an on-site visit at Batbatan Island was done. Seaweed plantlets (200 pcs) were planted at Sitio Bunlao, in a two 10-m culture lines. Water parameters and water quality were also monitored during the visit.

The Program also noted the request from the 39<sup>th</sup> PCM to incorporate the experience of Viet Nam on rice-shrimp farming systems in the areas of Mekong Delta, in relevant training courses to be conducted by AQD. To this end, in AQD's training course on ‘Community-based freshwater aquaculture for remote rural areas of Southeast Asia on 21-30 November 2017 in Rizal, Philippines, rice-shrimp farming will be incorporated in one of the course modules after finding the appropriate resource person.

#### 4. Adapting to Climate Change Impacts

- *Generate scientific information on the effects of high water temperature on the reproductive performance and recruitment of economically important marine aquaculture fishes*

Environmental temperature is an important factor directly affecting reproduction, spawning and recruitment of aquatic species. An extended El Niño phenomenon experienced in the Philippines from the end of 2015 until the first half of 2016 brought prolonged dry and hot spells followed by extended periods of heavy rains. During this period, disruption in the reproduction of most of the commodities were observed e.g. decreased maturation rates and fewer spawning events in captive shrimps, abalone and crabs, decreased production of cocoons in both wild and captive polychaetes, *Marphysa mossambica*, among others. Growth and survival of different commodities were also affected. Growth of *Kappaphycus* in the nursery and grow-out was lower during the El Niño months; whereas, *Caulerpa* showed slow growth especially towards the end of the El Niño months and the onset of the rainy season when extended periods of heavy rainfall (and fluctuations/drop in salinity was experienced) when negative growth rates were recorded. Development of nectochaetes was also affected by exposure to sunlight (and hence, temperature). Better growth and survival was obtained in nectochaetes cultured indoors, followed by those cultured in a partially shaded area. Poor growth and survival were recorded for nectochaetes cultured in an area that is directly exposed to sunlight. These observations point to the need for developing strategies or systems that would support normal growth and development under unfavorable or sub-optimal conditions brought about by climatic phenomena.

- *Promote awareness on the possible effects of climate change to aquaculture operations*

AQD's training courses continued to incorporate topics on the impacts of climate change on aquaculture and strategies toward resiliency. The AQD library continues to circulate articles on the impact of climate change to fisheries. The Department also provided expertise during a National Review and Calibration of Climate Change R&D Program of the Philippine Government in September 2017. Likewise, AQD will be attending the FAO Regional Consultation on Climate Resilient Fisheries and Aquaculture in the Asia-Pacific Region this November.

#### 5. Meeting Social and Economic Challenges in Aquaculture

- *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*

Fisherfolks continued to benefit from harvests of spill-overs from released hatchery-reared abalone and sandfish in the Community-Based Resource Enhancement (CBRE) site in Sagay Marine Reserve, Negros Occidental Province, Philippines, while the LGU and fisherfolk association continue to manage the CBRE project. The CBRE project participated in the Sustainable Seafood Week, a campaign of high-end gourmet establishments in Manila, to promote the abalone produce harvested from the project site as well as sustainable aquaculture practices.

On the CBRE of hatchery-reared tiger shrimp in the New Washington Estuary in Aklan Province, Philippines, some shrimp grew to marketable sizes but majority were prematurely caught by illegal fine mesh nets that should be regulated by local government.

The Integrated Multi-Trophic Aquaculture (IMTA) in Guimaras provided economic benefits to fisherfolk trained to grow and sell milkfish, women trained to debone and cook milkfish sardines, and school children fed with milkfish sardines. However, sandfish and seaweeds in IMTA system were not sustained due to predation and diseases.

- *Enhancing multi-agency collaboration, sharing of information and resources in addressing the common problems of alleviating the socioeconomic conditions of the poor sector of the region*

Multi-agency collaboration and sharing of information was done with partner LGUs, fisherfolk associations in areas where studies are conducted. Tri-party collaboration involving 1) organized fisherfolks, 2) local government, and 3) research institutions in IMTA in Guimaras and CBRE project sites

in Negros Occidental and Aklan provinces successfully demonstrated, promoted, and achieved social and economic objectives. The replication of CBRE in other sites was also initiated in other islands of Sagay and other potential remote coastal communities in Camarines Sur Province, Philippines through a local state university.

### **Other R&D Activities**

AQD continued to demonstrate its significant contributions to aquaculture development in the region through building institutional capacities and developing a critical mass of experts on aquaculture technologies. Trainings were conducted on the following: Mangrove crab hatchery, nursery & grow-out operations; sandfish seed production, nursery & management; seahorse culture; abalone hatchery & grow-out; oyster seed production, nursery & grow-out; marine fish (grouper, snapper, sea bass, pompano, rabbitfish and milkfish) hatchery; seaweed culture; grow-out culture of grouper; selected aquaculture technologies; tilapia and giant freshwater prawn hatchery and grow-out operations; and an online course on principles of health management in aquaculture. A total of 21 training courses were held from January to mid-September of 2017. These courses were attended by a total of 299 trainees. There are 7-8 more courses in the pipeline for the 4th quarter of 2017. Thirty-five individuals also availed of AQD's internship program and on the on-the-job training program was availed by 241 students from 31 schools.

For January to September this year, AQD has published "Philippines: In the forefront of the mud crab industry development," which is the proceedings of the 1<sup>st</sup> National Mud Crab Congress. An extension manual "Diseases of juvenile and adult mud crab *Scylla* spp. in the Philippines" was also produced and disseminated. Five new brochures on the culture of different aquatic commodities was also produced. "AQD Matters," the Department's newsletter continued to be published bi-monthly and circulated in-house and thru an email list. The official website ([www.seafdec.org.ph](http://www.seafdec.org.ph)) continued to be updated, improved, and integrated with social media. The SEAFDEC/AQD Institutional Repository (SAIR) has dramatically enhanced the accessibility of SEAFDEC/AQD publications and the visibility of the Department. From 01 January to 07 September 2017 alone, SAIR had 1,357,558 searches performed and 829,070 pdfs downloaded. This resulted in significant increase in the total downloads and searches from January 2011 to September 2017 at 9,636,860 and 3,625,911 respectively. AQD has so far participated in four exhibitions with at least two more slated for the rest of the year.

For the same period, FishWorld, AQD's museum and visitor center received 4,945 visitors. FishWorld summer internship program for high school students catered the learning needs of six students from two science high schools of the Philippines. The celebration of Aquaculture Week held last July was participated by seven high schools and 18 elementary schools from both public and private schools around Iloilo Province, with about 107 students and 66 coaches participating in the various Science-Art Contests. FishWorld works on the conservation of endangered megafauna. This year so far, 18 hatchlings of hawksbill turtles were released and the stranding of five green and three olive ridley sea turtles were documented.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Quality Seed for Sustainable Aquaculture  
**Responsible Department:** SEAFDEC/AQD  
**Total Duration:** 2012-2020  
**Funding Sources<sup>1</sup>:** Philippine Government  
**Estimated Budget for 2018:** USD 672,249

### 1. INTRODUCTION

Success in sustainable aquaculture production depends primarily on the availability of good quality seedstock for rearing to commercial sizes using efficient husbandry techniques under suitable farm conditions. With the intensification of aquaculture systems in several Southeast Asian countries and the environmental challenges such as those resulting from climate change, both factors – genetic quality and culture management, are equally important in ensuring a steady yield of good quality seeds and later, marketable aquaculture products.

### 2. PROJECT

#### 2.1 Goal/ Overall Objectives

Generate, verify and promote technologies to ensure the sustainable production of quality seed stock for aquaculture as well as for stock enhancement.

The specific objectives are to:

- Develop good quality broodstock for both traditional and emerging species
- Improve quality and production of seedstock through refinement of hatchery and nursery management methods
- Develop schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks
- Produce sufficient seedstock by adopting economically viable seed production systems

#### 2.2 Outcomes and Expected Outputs

- Production of good quality broodstock
- Increased seed stock production through the availability and adoption of refined and efficient hatchery and nursery protocols
- If available, promote genetically selected and improved stocks and apply techniques to optimize their use to improve on-farm aquaculture production
- Enough seed supply of major aquaculture commodities through the adoption of technically and economically-viable breeding and seed production schemes

#### 2.3 Project Description/Framework

The program focuses on studies and activities that determine optimal conditions and methods to produce enough quality seedstock. Conventional 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 are the approaches being adopted. Biotechnological tools such as DNA markers are developed and used in screening some key aquaculture species to complement management and selection schemes in genetic improvement. Molecular marker assessment is made possible through

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<sup>1</sup> Supplemental funds are also provided by other donors such as the Philippine's Department of Science and Technology, JIRCAS, GOJ-Trust Fund, ACIAR, etc.

external grants, physical facilities and human resources as provided for under collaborative opportunities with academic or other research institutions.

Although genetic intervention can enhance growth rate, survival, disease/ stress tolerance that are desired traits in the production of good quality seedstock, broodstock and seedstock improvement through nutritional intervention is also considered. Suitable hatchery and nursery protocols are being developed and refined depending on the level of technology for each species. These technologies are verified and are packaged into most viable or cost-effective broodstock and seed production methods. Once ready for dissemination, industry stakeholders, primarily fish farmers, shall be informed of advances in seed production through training and production of information, education and communication (IEC) materials such as technical manuals.

#### **Activity 1: Broodstock development**

To achieve the main objective of developing and managing quality broodstock for use in either commercial fish farming and/or stock repopulation, stock characterization using molecular markers are utilized to aid in determining genetic quality in hatchery stocks. This, apart from information on reproductive efficiency and production traits, help formulate suitable broodstock management protocols. Molecular markers (*e.g.* mtDNA and/or microsatellite markers) were used for genetic characterization in stocks of several regionally important species for aquaculture and stock enhancement such as the donkey's ear abalone (*Haliotis asinina*), and the mangrove crab (*Scylla serrata*). Nutritional intervention is also being done to improve reproductive traits. Apart from the abalone and mangrove crab, better breeding stocks of tiger shrimp, Indian prawn, sandfish, tilapia and giant grouper are developed.

#### **Activity 2: Refinement of hatchery and nursery protocols**

To increase production and rearing of larval and juvenile stages of important aquaculture species, mechanisms that (a) enhance laboratory and field-scale production of natural food organisms (*e.g.* use of illumination in nursery cages, etc.) and alternative food items (*e.g.* nematodes) which serve as early stage diets; as well as (b) improved rearing conditions and interventions that allow the aquatic organisms to adapt and survive well during larval development, are evaluated.

#### **Activity 3: Increase awareness on available genetically selected/improved stocks and optimize their use for improved on-farm aquaculture production**

This is done first either through the development of selected breeds at AQD and/or the evaluation of commercially available improved aquaculture breeds. Once such stock or strains are noted as superior then the same can be promoted to farmers for use with the end-goal of being able to increase on-farm fish yield.

#### **Activity 4: Promotion of technically and economically-viable breeding and seed production schemes**

It is not enough to disseminate information on innovative and technically feasible breeding and seedstock production methods. One must ensure that such methods are cost-effective thus can generate increased profit for the hatchery/nursery farm operator. The objectives for this activity can be achieved if the technologies based on science are verified on farm and will in the process, demonstrate economic viability.

### **3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2017**

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
<b>Broodstock Development:</b>		
<b><i>Marker-assisted broodstock development and management</i></b>		
<u>Abalone</u> Six microsatellite or short tandem repeat (STR) DNA markers were used to characterize the existing AQD abalone hatchery stock and nine wild stocks for broodstock genetic assessment. Agusan del Norte (Mindanao) and Palawan (Luzon) stocks had the highest variability based on the number of alleles ( $A = 17.8$ and $15.5$ ) and	Mid 2014- 2017	Identified abalone stocks/strains showing high genetic variability

Project/Activity Title	Duration	Remarks
<p>expected heterozygosity (<math>H_{exp} = 0.861</math> and <math>0.901</math>) while the lowest genetic variability was noted in the Sagay (Visayas) stock (<math>A = 5</math>, <math>H_{exp} = 0.792</math>). The AQD hatchery stock from Iloilo (Visayas) had variability indices slightly higher than those from Sagay at <math>A = 8</math> and <math>H_{exp} = 0.872</math>.</p>		<p>(hence, potentially better or more fit/ adaptable)</p>
<p>Spawning batches (minimum five families per stock) were also set up for strain comparison in terms of reproductive efficiency. Molecular marker variation data were obtained and later correlated with breeding performance. From the reproductive efficiency comparison, the AQD hatchery-bred abalone stocks had the highest number of eggs as well as the number of eggs per gram body weight (BW) female. Among the wild stocks, Zamboanga del Sur broodstock had the highest fecundity while the Pangasinan broodstock produced the most number of eggs/g BW female. For larval survival, stocks from Cebu had the highest rate. This information and those obtained from the molecular marker variation assessment shall be used in the formulation of a broodstock management and selective breeding scheme for the donkey's ear abalone.</p>		<p>Compared stocks/strains for reproductive performance</p>
<p><u>Mangrove crab (<i>Scylla serrata</i>)</u>            Genetic characterization of <i>Scylla serrata</i> stocks based on three novel and three existing STR markers is being done to maintain high genetic variability and check for the negative impacts of domestication in several generations of selected and control stocks from Camarines and Surigao. Thus far, raw data based on uncorrected estimates of the number of alleles (<math>A</math>) showed that the parental stocks from Camarines and Surigao had 10.17 and 10.33 number of alleles respectively while two batches of the first generation Camarines control stocks were lower at 6.67 and 6.5 respectively and one batch of the first generation Surigao control stock had <math>A = 6.33</math>. Slightly lower <math>A</math> estimates were noted in the first-generation selected stocks from Camarines (6.17 and 6.5) and Surigao (4.0). Expected heterozygosity estimates were not significantly different between the stocks and across generations based on the existing batches screened. Molecular marker data are being correlated with parameters for selected beneficial traits to determine if the markers could be used as preliminary indicators of genetic improvement.</p>	<p>Mid 2015-2018</p>	<p>Molecular assessment on stocks from Camarines and Surigao; stocks are used in selective breeding for disease resistance and fast growth; reproductive performance of the two strains are also being compared</p>
<p><b><i>Environmental and nutritional intervention to improve broodstock performance</i></b></p>		
<p><u>Tiger shrimp (<i>P. monodon</i>)</u>            To best understand conditions that encourage/facilitate mating in the tiger shrimp, experiments that would determine differences and problems in breeding performance of male and female spawners from captive and wild environments (stocked separately and/or their combination as mates) are being conducted. Video documentation on the reproductive behavior (pursuit of females by males and vice versa and number of mating episodes) of adult <i>P. monodon</i> during trials separately exposing spawners to varying depth, temperature and methyl farnesoate (a hormone that could induce female crustacean molting and reproduction) are on-going. Histological and gonad morphology evaluation of the male breeders also being done. No mating has been observed thus far. The wild and captive male shrimps appeared to pursue wild female shrimps more frequently than the captive ones. More trials are necessary.</p>	<p>2016-2017</p>	<p>On-going; more trials are to be conducted on temperature manipulation and hormone use for more conclusive Results</p>
<p>In another study, incorporation of vitamin C in the shrimp broodstock diet reduced incidence of mortalities in domesticated shrimp broodstock. When young postlarval stages (for on-growing to potential broodstock size) were fed 2% taurine, mass weight was significantly higher compared to treatments with lower taurine levels.</p>	<p>2015-2017</p>	<p>More trials are to be conducted esp. on micronutrient incorporation.</p>

Project/Activity Title	Duration	Remarks
In comparing reproductive performance of spawners reared in pens against those grown in tanks, tank-reared stocks resulted in maturation until stage 2 but no stocks matured in the pens.		Testing on a subsequent generation of shrimps initially fed with the same micronutrient-lined feeds shall be done
<u>Indian prawn <i>Penaeus indicus</i></u> Polychaete meal is to be incorporated in formulated broodstock diets and administered to adult Indian prawn stocks to determine the effect of these diets on male sperm quality, female ovarian maturation and reproductive performance. Polychaete meal and the test diet have been analysed for proximate composition and stability (especially of the test diet).	2017	Feeding trials shall commence in October.
<u>Sandfish (<i>Holothuria scabra</i>)</u> The development of an appropriate diet to improve breeding performance and larval quality in sandfish <i>Holothuria scabra</i> is ongoing. The basic biological composition or profile (protein, lipids, fatty acids etc.) of wild and hatchery-produced sandfish were determined. Using the proximate composition of wild-caught mature sandfish as reference, the appropriate practical diet is being developed to ensure that the nutritional requirements for enhancing breeding performance in adult sandfish are met. Feeding trials showed that although the present growth data cannot be statistically analyzed, there is an observed higher proportion of larger individuals (BW>60 g) in groups fed diets contain varying levels of protein (42%, 32% and 22%) and low level of lipid (5%). This implies that sandfish may require only low dietary levels of both protein and lipid, and that high lipid content may be unfavorable to growth (though not necessarily to maturation).	2016-2017	Validation of the results of the feeding experiments must be done with the conduct of additional, well-replicated runs
<u>Tilapia (<i>Oreochromis</i> spp.)</u> Use of plant-based protein sources in tilapia feeds for improved production traits [Reported as Activity 1.1 under the project “Promotion of sustainable aquaculture and resource enhancement in Southeast Asia : Environment-friendly, sustainable utilization and management of fisheries and aquaculture resources”]	2015-2017	
<b>Broodstock management, breeding protocol development for other species (for stock management and enhancement)</b>		
<u>Giant grouper</u> Activities continue to be implemented for a giant grouper study focused on broodstock development and genetic stock management. ACIAR is supporting this preliminary work on broodstock collection and genetic variability assessment using molecular markers. The msDNA-based genetic stock assessment is being done by an AQD junior staff at the University of the Sunshine Coast. The giant grouper broodstock collected from local sources are being kept at the Igang Marine Station for regular monitoring of gonadal maturity.	2014 to date	
<u>Seahorse (<i>Hippocampus</i> spp.)</u> Promotion of resource enhancement of seahorses [Reported as Activity 2.2 under the project “Promotion of sustainable aquaculture and resource enhancement in Southeast Asia : Environment-friendly, sustainable utilization and management of fisheries and aquaculture resources”]	2015 to date	
<b>Other Studies:</b> <b>Production of nonconventional feed ingredients for use in broodstock diets</b>		
Refinement of rearing and feeding techniques for sustainable mass	2016-2017	Confirmatory

Project/Activity Title	Duration	Remarks
<p><u>production of polychaete <i>Marphysa mossambica</i></u>            This year, the effectiveness of biofloc was compared against other natural food items as starter feed and settlement substrate for early stage polychaetes. Critical stages during early development of <i>M. mossambica</i> are also being identified. Egg hatchability and larval development of <i>M. mossambica</i> subjected to varying irradiance and photoperiod treatments are also being investigated. Likewise, the optimum stocking density and sediment depth requirement of the polychaetes during their nursery and grow-out phases are being determined. Finally, the effect of light exposure on the growth and survival in the growout phase of the polychaete, is also being investigated.</p>		<p>runs being done in all sub-activities</p>
<p><b>Refinement of Hatchery and Nursery Protocols</b>  <b><i>Improvement of rearing protocols</i></b></p>		
<p><u>Abalone (<i>Haliotis</i> spp.)</u>            Abalone studies have been done to determine the effectiveness of using chemical cues (positive ions, algal extracts) to improve settlement rate, increase production of juveniles through improved culture techniques. Moreover, efficient sorting and harvesting protocols using muscle relaxant to improve survival rate of abalone juveniles were developed. This year, abalone larvae were exposed to concentrations of serotonin (0, <math>10^{-3}</math>, <math>10^{-4}</math>, <math>10^{-5}</math>, and <math>10^{-6}</math> M) for two hours. After 120 h, larvae exposed to Control (0 M serotonin) induced a settlement rate of 8.33%, while the remaining test concentrations showed no inductive effect regardless of settlement substrate. To determine the effectiveness of using algal cues as settlement inducer, two combinations of treatments were used in an experiment: a) Treatment 1: transparent tank + <i>Nitzschia</i> sp. b) Treatment 2: transparent tank + <i>Nitzschia</i> sp. + A-MPD or agar-bound microparticulate diet + 0.1 mM <math>\text{NH}_4\text{Cl}</math>. In five days, a higher settlement rate (<math>12.06 \pm 0.96\%</math>) was observed in Treatment II compared to T1 (<math>5.11 \pm 1.09\%</math>). At Day 10, T2 consistently showed higher settlement rate (<math>2.83 \pm 0.40\%</math>) than T1 (<math>1.95 \pm 0.26\%</math>).</p> <p>Trials were also made on the application of potential chemical cues (<math>\text{NH}_4\text{Cl}</math>, GABA and serotonin) in bigger tanks. Application of 0.1 mM ammonium chloride (<math>\text{NH}_4\text{Cl}</math>) was tried in 1.5-ton fiberglass tanks in combination with <i>Arthrospira platensis</i> and <i>Nitzschia</i> sp. for abalone settlement. Highest settlement rate of <math>4.49 \pm 0.38\%</math> was attained after 5 d, while settlement after 10 d was <math>1.95 \pm 0.23\%</math>.</p>	<p>Mid 2014-2017</p>	<p>Confirmatory runs for the remaining experiments are to be done; study almost complete</p>
<p><u>Blue swimming crab (<i>Portunus pelagicus</i>)</u>            The larval rearing protocol for the blue swimming crab focused on the refinement of feeding and water management strategies to increase the survival rate of the megalopa from 3-5% to 6-10% and crab instar. First, a technique to determine larval quality in the blue swimming crab was established using the formalin stress test (30-minute formalin exposure of newly hatched zoea to distinguish good from poor quality larvae). The method is being promoted for use in hatcheries to ensure that the larvae being reared further are only the good quality larvae to ensure higher seedstock yield. Apart from this, trials on the use and non-use of antibacterial agents and its effect on the crab larvae were conducted. Results showed that those without antibiotics survived but the rate was lower than the batches with the antibacterial agents. Mass production of crablets was likewise pursued under the project.</p>	<p>Mid 2014-2017</p>	<p>Completed; technology adoption activities were also pursued by the project</p>
<p>The protocols for hatchery and nursery-rearing of the blue swimming crab are being optimized. Crab instar 1-2 have been shown to tolerate salinities of 16-32 ppt. Later stages (stocked at C3) showed tolerance to 8-20 ppt, but higher survival was achieved at 16-32 ppt. Crab</p>	<p>Jan 2017 to date</p>	<p>Confirmatory runs for the remaining experiments are</p>

Project/Activity Title	Duration	Remarks
<p>molting interval and increments were similar in all salinities from 16-32 ppt.</p> <p>Feeding trials for nursery rearing were conducted using 6 feed types, the control diet being mussel meat. The other diets were: 1) Diet X (32%protein); 2) Diet Y; and 3) Diet Z; 4) Diet A or MCD (diet originally used for mangrove crab); and 5) Diet B or Mod MCD (modified version of MCD, cheaper alternative). All formulated diets were fed in combination with mussel at a ratio of 70% formulated diet + 30% mussel meat. After 45 days, percentage survival ranged from 22 to 38%, and values were not significantly different. When diets A, B and Z were used in nursery pond trials, survival was higher at 74.72 to 86.67% but no significant difference was noted.</p> <p>The optimal stocking density for the blue swimming crab during the second nursery rearing phase in hapas within pens was established at 10-15 individuals/m<sup>2</sup>. Finally, to determine the suitable shelter for blue swimming crab nursery rearing, the following materials: “artificial seagrass”, net curtains, pipes, and the conventional recycled tied nets were compared. All shelters used resulted to survival rates that were not significantly different.</p>		to be done; study almost complete
<p><u>Mangrove crab (<i>Scylla serrata</i>)</u> For ease in the hatchery rearing of mangrove crab seedstock, the use of algal paste in rotifer cultures for mangrove crab seed production was evaluated. Initially, <i>Nanochlorum</i> paste was used in rotifer culture but <i>Tetraselmis</i> paste proved to be a better option hence further establishment of protocol for the use of <i>Tetraselmis</i> paste will be done to improve the growth and density of rotifer compared to the <i>Nanochlorum</i> batch culture.</p>	June 2017 to date	performance of crab larvae given algal paste-fed rotifers will be determined
<p><u>Pompano <i>Trachinotus blochii</i></u> Pompano are opportunistic feeders as they can readily feed on wild zooplanktons (<i>i.e.</i> copepods and other benthic organisms including polychaetes) present in ponds or in fish cages in marine waters. The idea of attracting wild zooplanktons to serve as (supplemental) food in the culture of pompano by artificially lighting the nursery net cages is being explored.</p>	June 2017 to date	Experiment on-going
<p><u>Sandfish <i>Holothuria scabra</i></u> To optimize growth and survival of sandfish juveniles to 20g fingerling size, rearing is divided into two nursery phases: primary nursery phase for early juveniles (&lt;5mm to &gt;40mm or 3 g) and secondary nursery phase for late juveniles (3 g to &gt;20g). Nursery rearing methods include the evaluation of (a) density, composition and seasonality of natural algal biofilm on tank based hapa nets, (b) rearing performance of tank based primary nursery system for early juvenile sandfish and (c) rearing performance of tank based secondary rearing performance for late juvenile sandfish. Preliminary results from a 4-week hapa-in-tank nursery run showed no significant difference in the biofilm properties in the rearing water as well as the growth rate of sandfish juveniles in shaded (3.23%/day growth rate) and open tanks (4.55%/day) which served as treatments. With this, some modifications in the tank system have been made and the second nursery rearing run was conducted and is still ongoing.</p>	June 2017-June 2018	Experiments on-going
<p><u>Seaweed <i>Kappaphycus</i></u> To enable promotion of <i>Kappaphycus</i> culture, nursery rearing techniques have been refined. Tissue-cultured cultivars are produced in the laboratory and reared in land-based nursery tanks and sea cages.</p>		
<p><u>Potential of locally-available microalgal strains as food for the minute monogont rotifer, <i>Proales similis</i> de Beauchamp</u></p>	2016-2017	Experiments are still being

Project/Activity Title	Duration	Remarks
<p>The biochemical, proximate and cost of production of <i>C. sorokiniana</i> was established. Semi-batch culture trials show lower cost of <i>C. sorokiniana</i> paste production is achievable. <i>P. similis</i> can tolerate high salinity (30ppt) but better results are obtained if acclimatization is done prior feeding with the algae.</p>		continued
<p><b>Other Studies</b>  <b>Milkfish, <i>Chanos chanos</i></b>            In the milkfish, a study that aims to develop a protocol in transporting milkfish juveniles (with an average total length of 5-6 inches) from the nursery to sea cage facilities has been started. This experiment hopes to define optimal temperature and salinity requirements for the transport of milkfish juveniles. The study likewise includes trials on the suitable conditioning period of confinement in cages in ponds before the juveniles are transported to milkfish sea cage farming sites.</p> <p>Preliminary findings show that survival of milkfish juveniles a week after being transported for 4 to 6 hours at 25°C regardless of salinity levels (0 to 20 ppt) still attained high survival (94 -100%). In contrast to the first two transport period trials, transporting milkfish juveniles at 25 °C under higher salinities could still survive well. However, the lowest survival percentage was 78.08±4.45 %. Prolonging the transport time to 12 hours does not have any adverse effect on the juveniles.</p>	2016-2017	Some confirmatory trials yet to be conducted to complete the study
<p><b>Increase Awareness on Available Genetically Selected/Improved Stocks and Optimize their Use for Improved On-farm Aquaculture Production</b>            This year, the genetic improvement research initiatives being continued are on at least two species – abalone and the mangrove crab as described in the section on broodstock development. The mangrove crab project is aiming to produce fast-growing and disease-resistant lines while the abalone project focused on improved breeding performance through strain comparison/evaluation and other beneficial traits such as growth. Once lines/strains have been identified and are confirmed to be better, both improved strains and the protocols that were formulated to produce these improved stocks are to be documented and the stocks promoted for dissemination.</p>	2015-2017/ 2018	Both projects were/are being funded by the Philippine Department of Science and Technology; the abalone project ends this year while the mangrove crab project ends in 2018
<p><b>Promotion of Technically and Economically Viable Breeding and Seed Production Schemes</b></p>		
<p><u>Tilapia (<i>Oreochromis niloticus</i>) and giant freshwater prawn (<i>Macrobrachium rosenbergii</i>)</u>            This project is into the production of Nile tilapia and giant freshwater prawn to serve the needs of small-scale prawn farmers in the vicinity and verify/demonstrate methods for urban agri-aquaculture (aquaponics) in the Binangonan Freshwater Station, primarily using tilapia and/or prawns. Technical and economic viability of the seed production systems and the aquaponics fish and vegetable production system shall be made. This study also hopes to teach peri-urban communities, technologies on urban agri-aquaculture to provide them alternative livelihood options.</p> <p>Tilapia seed production to date (September 2017), about 92,740pcs of fry and 46,377 pcs of A-net size seedstock were harvested from the tanks used for production of seeds meant for grow-out while 45,154 fry and 18,381 A-net size seedstock were obtained from the tank for potential broodstock production and development.</p> <p>On prawn seedstock production, data seven months from initial stocking recorded about 170,280 hatchlings harvested for on-growing to post larvae. Finally, based on the most recent (eight)</p>	2016-2017	On-going tilapia and prawn seed production and aquaponics-based vegetable and fish/prawn production runs

Project/Activity Title	Duration	Remarks
<p>sampling schedule, 25,060 hatchlings were obtained thus far and three berried females have yet to spawn.</p> <p>To verify demonstrate and promote prawn/tilapia based urban agri-aquaculture technologies, a greenhouse and two portable aquaponics systems have been constructed. For the first set-up, kangkong seedlings were transplanted to the aquaponics substrate (1 cocopeat:1 carbonized rice hull: 1 fine sand: 1 plain rice hull). Giant freshwater prawns (12 pcs, ave wt: 10.74g) and red tilapias (40pcs, ave wt: 34.8g) were stocked separately in the tanks with the red tilapias fed daily with fish pellets. For the second set up, pechay were planted in the pots while tilapias were stocked in the blue drum that served as the fish holding tank.</p> <p>Training on these potential aquaculture-based livelihood opportunities will be conducted in November after being able to demonstrate that the aquaponics system is technically feasible.</p>		
<p><u>Donkey's ear abalone, <i>Haliotis asinina</i></u>  Abalone juvenile production is on-going. From September 2016 to August 2017, a total of 68,503 abalone juveniles (5mm – 8mm SL) were harvested with an average survival rate of 0.60% (rates ranging from 0.09% to 1.66%). Harvested abalone juveniles were reared further in the nursery tanks until they reached 1.1 – 1.5 cm or bigger and were ready for disposal. From January to August 2017, a total of 3,360 abalone juveniles were sold with total cost of P18,940.00. Furthermore, a total of 11 kgs of marketable size abalone costing to P4,400.00 was sold.</p> <p>A seed production scheme using reduced flow-through system was tried. This scheme produced an average of 3,008 abalone juveniles with a survival rate averaged to 1.09%. Control runs, however, resulted to an average of 2,548 abalone juveniles while survival rate averaged at 0.93%. Further runs will be made using larger 10-ton tanks.</p> <p>As for technology dissemination, several batches of students spent their on-the-job training at SEAFDEC/AQD, learning skills in abalone seed production. From January to August 2017, there were 17 student on-the-job (OJT) trainees from the following schools: Aklan State University, Capiz State University, Cebu Technological University, Central Philippine University, Don Mariano Marcos Memorial State University, Iloilo State College of Fisheries, Marinduque State College, Mindanao State, Partido State University, Philippine Science High School, University of Southern Mindanao and University of the Philippines Visayas. Three international students from the University of Gent, Belgium and one non-student trainee from Buyuan, Tigbauan, Iloilo have also undergone internship in the abalone hatchery.</p>	2016-2017	Abalone juvenile production shall continue, technology dissemination through training will also continue

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2018

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Domestication of potential broodstock through surveys and collection of sandfish, abalone, mangrove crab, <i>P. monodon</i> and grouper; Determination of genetic stock diversity of shrimp, blue swimming crab, sandfish, and seaweeds; Stock delineation for sandfish; Selective breeding of <i>P. monodon</i>		Collaboration with ACIAR and DOST-PCAARRD (abalone and

Project/Activity Title	Duration	Remarks
		mangrove crab)
Establishment of proper broodstock development protocols for <i>P. monodon</i>		
Nutritional intervention through the development of maturation diets for sandfish and silver perch; Improving the maturation diet of <i>P. monodon</i> ; development of mass production for natural food ( <i>Proales</i> , copepods, mysids, annelids)		
Selective breeding/genetic improvement through assessment of reproductive efficiency of hatchery-bred shrimp spawners/breeders; production of genetically-improved tilapia fingerlings		
Stock management of unselected stocks by monitoring genetic diversity of stocks through generations (shrimp, sea bass); documentation of genetic diversity (high-value marines species, seaweeds)		Seaweed genetic diversity study in collaboration with GCRF (UK)
Design training courses, extension methods, and produce information materials on on-farm broodstock management		
Nutritional intervention by enriching larval diets for better fry quality; development of larval feeds for abalone and mangrove crab; Verification of <i>Nitzchia</i> microparticulate diet		In collaboration with private hatcheries, DOST-PCAARRD for larval feed development
Development of hatchery technique for emerging species (Angelwing clam, <i>Scatophagus argus</i> )		
Nursery culture of high-value marine fish using shelters and sorters, high-density recirculating system and ponds		
Development of strategies to reduce cannibalism in blue swimming crab		
Development of fry quality assessment criteria for blue swimming crab, and shrimp nauplii		

#### 4.2 Expected Outcomes/Outputs

##### Shrimps:

- Improved growth, breeding/reproductive performance; healthy broodstock produced
- Conditions and protocols for reproductive performance improvement established
- Technology for sustainable production of high health captive broodstock developed

##### Freshwater prawns:

- Effective broodstock management schemes for giant freshwater prawn developed
- Cost-effective and low-pollution prawn broodstock diet developed

##### Mangrove crab/blue swimming crab:

- Larval rearing protocol improved
- Mass production method of annelids established
- Improved growth, breeding performance
- Healthy broodstock produced; inbreeding minimized
- Nursery production improved
- Reduced seed production cost and increased survival
- Optimal hatchery and nursery protocols available
- Preliminary objectives for selective breeding (especially for mangrove crab) attained

Marine fishes:

- Fry quality improved through broodstock management
- Genetic stocks screened; information used for broodstock management
- Methods to reduce cannibalism determined; schemes to improve survival determined
- Optimal conditions for seed production/larval rearing established
- Verification runs using optimum stocking density and AQD formulated feeds conducted
- Nursery rearing of marine fishes improved
- Target production achieved

Freshwater fishes:

- Tilapia fingerlings (normal, sex-reversed and mixed sex Nile tilapia hybrid) produced
- Production target attained
- Breeding and seed production protocol defined for emerging species
- Larval rearing methods optimized for emerging species

Shellfishes:

- Improved hatchery methods
- Genetic stocks for broodstock production and selective breeding in abalone evaluated
- Production technology demonstrated and disseminated
- Most efficient spawning techniques for oyster verified
- Existing larval and post-larval rearing techniques refined

Other invertebrates:

- Consistent method (stock management and nutrition) for broodstock conditioning for spawning established
- Survival of sandfish juveniles improved through efficient nursery systems.

Seaweeds:

- Disease-resistant strains developed
- Performance of diploid *Kappaphycus* in natural environment evaluated
- Nursery rearing protocol for production of *Kappaphycus* seedlings optimized
- Culture method defined; production target achieved

General:

- Training courses on fish/crustacean/mollusk breeding and hatchery operations conducted
- Clients under the Agree Build Operate and Transfer AquaNegosyo supported in terms of technical assistance in hatchery/nursery operations
- New manuals and updated manuals on breeding and hatchery operations for selected species published
- Information disseminated through publications and participation in fairs/exhibits

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Healthy and Wholesome Aquaculture  
**Responsible Department:** SEAFDEC/AQD  
**Total Duration:** 2012-2020  
**Funding Sources:** Philippine Government  
**Estimated Budget for 2018:** USD 525,204

### 1. INTRODUCTION

The development of aquaculture feed with less dependence on fish meal and fish oil, as well as the advancement of aquatic health management are the thrusts of this program towards a healthy and wholesome aquaculture. Feed formulations for important aquaculture species in the region have been sought out, characterized and biologically tested in aquaculture laboratories. Although inclusion levels of fish oil and fish meal can be reduced without affecting the growth performance of cultured species, the increasing volume of feed produced for the industry has led to the increase of their usage in aquaculture. Replacing these commodities in aquaculture feed is recognized as an international research priority towards a sustainable increase in fish production. Further, innovations on fish health management are necessary in face of devastating losses due to various aquatic diseases. New approaches to disease management, including the use of probiotics, alternative safe drugs/chemicals and natural products to replace harmful drugs which have raised concerns for safety and quality. The preservation of the environmental quality of aquaculture sites is likewise necessary.

### 2. PROJECT

#### 2.1 Goal/Overall Objectives

Contribute to improvement of aquaculture production through innovations in nutrition, feeding, fish health management, and in preserving the environmental integrity of aquaculture.

The specific objectives are to:

- Find effective alternative protein sources to fish meal in dietary formulations
- Determine specific nutrients that enhances growth performance
- Promote practices and strategies in nutrition to improve production
- Investigate the efficacy of probiotics and rationalize the need and application of diagnostics that will ensure biosecurity within culture systems and keep out exotic pathogens, especially trans-boundary pathogens
- Promote the wider use of conventional diagnostic as well as new methods especially for newly reported, emerging diseases
- Find effective alternative safe drugs/chemicals (including natural products) to manage aquaculture diseases in lieu of harmful chemicals and drugs whose use has been discouraged or banned due to quality and safety issues

#### 2.2 Outcomes and Expected Outputs

- Alternative protein sources identified for the larval diet of tilapia (*Oreochromis niloticus*) and grouper fingerlings (*Epinephelus coioides*), and lipid source for the abalone (*Haliotis asinina*)
- Development of adequate formulations for the Asian seabass (*Lates calcarifer*) by determination of three essential amino acids required for growth
- Protocols and strategies to increase production of *Penaeus indicus*, soft-shell *Scylla serrata* and two other *Scylla* species promoted
- The application of probiotic *Bacillus* species in larval rearing of *Penaeus* established
- Economics of producing *Scylla serrata* juveniles for soft-shell crab farming identified

## 2.3 Project Description/Framework

### Activity 1: Find effective alternative protein sources to fish meal and fish oil in dietary formulations

Milkfish by-product is protein rich with high potential as a feed ingredient. Processing this into a hydrolysate using an enzyme could improve its utilization. Milkfish by-product is processed into hydrolysate and evaluated as a feed ingredient in the diet of the freshwater finfish larvae of tilapia (*Oreochromis niloticus*). The effect on larval enzyme development is assessed.

Copra meal is about 21% protein. Increasing the level of protein in this ingredient would make this a valuable replacement for fish meal. Protein-enhanced copra meal (PECM) is a potential alternative protein source in diets of high value species such as grouper, (*Epinephelus coioides*). This product is analyzed for nutrient profile and included in different levels in grouper diet. The optimum inclusion level of PECM, its nutrient digestibility and the effect on liver and distal intestine morphology of grouper are assessed.

The abalone, *Haliotis asinina*, is a high value commodity in the export market and this species readily accepts formulated diet. Lipid source is considered important in the diet of abalone breeders. The algae, thraustochytrid, has a good profile of fatty acids and would be a good alternative source for fish oil in the abalone diet. The optimum amount of thraustochytrid in the abalone breeder diet will be determined and the resulting reproductive performance assessed.

### Activity 2: Determine specific nutrients that enhances growth performance

The Asian seabass is a popular food fish in the region. The commercial feed for this species is not specifically formulated and feed for other high value species such as snapper and grouper feed are used instead. An efficient feed for sea bass can be formulated by inclusion of essential amino acids at required levels. This activity would determine the three amino acids required by seabass namely, leucine, isoleucine and histidine. Amino acid test diets will be prepared for seabass and requirement levels will be based on growth data and biochemical parameters.

### Activity 3: Promote practices and strategies in nutrition to improve production

*P. indicus* has a potential as a crustacean species for culture in the Philippines. A study on hatchery production and semi-intensive pond culture of this species are conducted. Breeders from the wild are collected to produce postlarvae in the hatchery so that these can be grown and finally produce hatchery-bred breeders. The response of hatchery-bred postlarvae fed two commercial diets are assessed in a pond feeding experiment to demonstrate profitability of a semi-intensive pond culture of this species.

Soft-shell crab production is established in some countries in the region, however, the source of the mangrove crab is from the wild and may not be sustainable in the future. DOST funded a project on soft-shell crab production with crabs sourced from hatchery. A soft-shell crab production in a commercial scale model farm is being established for dissemination to stakeholders through training and collaboration. Crabs like other crustaceans need to molt to grow and that molting is not simultaneous. A study on spinach leaves extract is conducted in the laboratory with the aim to induce crab to molt. The extract is a natural source of phytoecdysteroids that could induce molting.

### Activity 4: Testing the efficacy of indigenous probiotics

The protective effects of *Bacillus* sp. JL47 containing different levels of amorphous Poly- $\beta$ -hydroxybutyrate (PHB) was examined using gnotobiotic *Artemia*. The effects of PHB-accumulating *Bacillus* sp. on the water quality and thermal stress response of *Penaeus monodon* postlarvae during culture are also currently being investigated. The efficacy of commercial probiotics (PRO W, PRO 2) and disinfectant (PUR) to control acute hepatopancreatic necrosis disease (AHPND) and luminescent vibriosis in *P. vannamei* culture is likewise being investigated.

### Activity 5: Rationalize the need and application of diagnostics that will ensure biosecurity within culture systems

The sanitary qualities of two major oyster production areas in Capiz Province are investigated for fecal coliform count, *Escherichia coli* count, *Vibrio parahaemolyticus* count, and presence of *V. cholerae* and *Salmonella*, in the rearing water and oysters' meat, respectively. Oysters are filter feeders and can concentrate bacteria from surrounding seawater in their digestive system. *E. coli* is normally found in the feces of humans and warm-blooded mammals, hence, the ability of *E. coli* to survive in the water of oyster production areas serves as indicator of fecal contamination. The presence of heavy metals in the oyster meat is also monitored. Relaying stations are also monitored for their suitability, in terms of fecal coliform count, to provide for the need to relay or deurate oysters.

### Activity 6: Rationalize the need and application of diagnostics that will ensure biosecurity within culture systems

## 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2017

Project/Activity Title	Duration	Remarks
<p><b>Find Effective Alternative Protein Sources to Fish Meal and Fish Oil in Dietary Formulations</b></p> <p>For tilapia larvae, grouper fingerlings and abalone, feeding experiments are ongoing including the study on amino acids required by sea bass growth. Confirmatory runs were conducted this year to verify results obtained in earlier runs. Currently, the amount of crude fat in the mass-produced thraustochytrid was still low (1.8-2.8%), hence, isolates were prepared in petri dishes with the aim to increase crude fat content of the algae. Results showed that crude fat in the isolates was high at a level of 20%. This information is important as this could be a good alternative to marine lipids in formulated diets for aquaculture species.</p>		These studies will have confirmatory runs to achieve objectives. Amino acid studies needed longer period to undertake.
<p><b>Promote Practices and Strategies in Nutrition to Improve Production</b></p> <p>Postlarvae of <i>P. indicus</i> were successfully produced in the hatchery and stocked for grow-out culture. Better performance was noted in shrimp fed commercial diet low in crude protein content (40%) which will be verified in another run. Male with sperm and mated female were noticeable during harvest and could be sources of breeders. A collaboration was agreed with a farmer to use his pond for the grow-out culture of hatchery-bred <i>P. indicus</i> where all inputs are documented to determine profitability of <i>P. indicus</i> semi-intensive pond culture.</p>		
<p><b>Testing the Efficacy of Indigenous Probiotics</b></p> <p><i>Effects of Poly-β-hydroxybutyrate-accumulating Bacillus species on the water quality and thermal stress response of P. monodon postlarvae during culture</i></p> <p>The protective effects of <i>Bacillus</i> sp. JL47 containing different levels of amorphous Poly- β-hydroxybutyrate (PHB) in a model culture system using gnotobiotic <i>Artemia</i> were examined. The <i>Bacillus</i> isolate was grown to accumulate different levels of amorphous PHB (29% and 55% PHB on cell dry weight) and was fed to gnotobiotic <i>Artemia</i> nauplii during a <i>Vibrio campbellii</i> LMG 21363 challenge test. The results showed that <i>Artemia</i> nauplii fed the <i>Bacillus</i> sp. JL47 containing 55% PHB attained a significantly higher survival than those <i>Artemia</i> fed the <i>Bacillus</i> sp. JL47 containing 29% PHB. Moreover, a complete protection against pathogenic <i>V. campbellii</i></p>	2016-2017	Ongoing study

Project/Activity Title	Duration	Remarks
<p>was observed in <i>Artemia</i> fed the <i>Bacillus</i> sp. JL47 containing 55% PHB since no significant difference was observed between this treatment and the non-challenged control. The data suggest that, the protective effects of <i>Bacillus</i> sp. JL47 is superior when it contains higher amount of amorphous PHB and that the amorphous PHB is suggested to be a main determinant in the protective effect of the <i>Bacillus</i> sp. JL47.</p> <p>In another study, <i>P. monodon</i> PL (1.75 cm ± 0.75 S.D.) were acclimatized for a week and cultured for 30 days in 50 L nursery tanks at 5 shrimps L<sup>-1</sup>. Shrimps were fed shrimp diet supplemented with PHB-accumulating <i>Bacillus</i> sp. JL47 at 5 g kg<sup>-1</sup> feed (0.5%). Shrimps fed diet without <i>Bacillus</i> sp. JL47 supplementation was used as control. At 7,14, 21 and 30 days of culture (DOC), 30 shrimps from each tank were transferred in glass aquaria containing 7 L seawater and subsequently bath challenged with <i>V. parahaemolyticus</i> 1213 strain at a dose of 1 x 10<sup>5</sup> cell mL<sup>-1</sup> for 24 h. Shrimps were eventually monitored for 7 days. Results showed that survival in all treatments was very low in shrimps challenged after 7 (0% survival in all treatments), 14 (control: 0% survival; JL47: 0.83% survival) and 30 days (control: 16.7% survival; JL47: 14.8% survival) of feeding (treatment). However, at 21 DOC, challenged shrimps fed with <i>Bacillus</i> sp. JL47 showed higher survival (52.5% survival) compared with the control (16.7% survival).</p>		
<p><b><i>Use of commercial probiotics (PRO W, PRO 2) and disinfectant (PUR) to control acute hepatopancreatic necrosis disease (AHPND) and luminescent vibriosis in P. vannamei</i></b></p> <p>The practical applications of commercial probiotics (PRO W, PRO 2) and disinfectant (PUR) to control acute hepatopancreatic necrosis disease (AHPND) and luminescent vibriosis in <i>P. vannamei</i> in penaeid shrimps were investigated. Ongoing experiments focus on the effect of PRO 2 on the bacterial level/ load and composition in the gut of <i>P. vannamei</i> and rearing water and effect of PRO W on water quality and as well as growth and survival of <i>P. vannamei</i> when added in the rearing water. In addition, the effects of INVE probiotics (PRO W, PRO 2) and disinfectant (PUR) on the survival of <i>P. vannamei</i> against <i>V. parahaemolyticus</i> and <i>V. harveyi</i> challenge are being examined.</p>	2016-2017	Contracted research
<p><b>Rationalize the Need and Application of Diagnostics that will Ensure Biosecurity within Culture Systems</b></p> <p><b><i>Establishment of sanitary quality of oysters (Crassostrea iredalei) and their culture environments</i></b></p> <p>In an attempt to determine the microbial quality of oysters grown in Capiz province, major oyster production sites located along the coastal villages of Roxas City (Culajao [n=3 sampling stations] &amp; Cagay River [n=5]) and municipalities of Ivisan (Cabugao Bay [n=7]) and Panay (Culajao River [n=5]), Capiz province, Panay, Western Visayas, Philippines, were examined monthly for their microbiological quality, i.e. quantity of <i>Escherichia coli</i>, <i>Vibrio cholerae</i>, <i>V. parahaemolyticus</i>, and <i>Salmonella</i> in oysters' meat and intervalvular fluid and fecal coliforms of the rearing water, over a period of 2 years. The monthly coliform count in the water samples collected from all sampling stations were generally high (≤ 540 MPN/100 ml) regardless of the sampling period (wet or dry season). Similarly, the monthly <i>E. coli</i> count in oysters' meat and intervalvular fluid were typically high (330~24,000 MPN/100 g) particularly</p>	2014-2017	DOST- PCAARRD GIA funded study. 100% completed; terminated September 2017

Project/Activity Title	Duration	Remarks
during the warm dry months of the year, <i>i.e.</i> April to June. <i>V. cholerae</i> was not detected in any of the oyster samples examined while <i>V. parahaemolyticus</i> count was within acceptable range. <i>Salmonella</i> was erratically detected in oysters collected from all sampling stations examined. Relaying oysters in an approved area in Cabugao Bay was likewise attempted. As a result, <i>E. coli</i> count in contaminated oysters significantly dropped from 24,000 MPN/ 100g to $\leq 20$ MPN/ 100g after 2 weeks of relaying, suggesting the practicality of this technique in rendering raw oysters safe for human consumption. Taken together, current data indicate the urgent need to improve the quality of raw oysters cultured in these sites through the adoption of environment friendly culture methods such as raft or long line together with the establishment of a National Shellfish Sanitation Program whose primary task shall include continual monitoring of the microbiological quality of oysters and their culture environments.		
<b>Prevention and Mitigation of Diseases in Cultured Mudcrab</b>  Because vibriosis and white spot syndrome virus (WSSV) persistently cause mortality in mud crab, <i>i.e.</i> vibriosis in the hatchery phase and WSSV in the grow-out phase, indicators responsible for disease occurrence or outbreak in cultured shrimps are currently being investigated. Shrimp mortality due to WSSV infection could be due to the viral load and environmental conditions such as low water temperature. Also, WSSV might be present in the pond soil and water, and may serve as vehicle for infection. Thus, to address these concerns, the threshold levels for WSSV in the water, soil, and system of mud crab that may result in infection and mortality or outbreak are currently being examined <i>in vitro</i> and <i>in vivo</i> .	2016-2018	DOST- PCAARRD GIA funded study

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2018

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Confirmatory runs of feeding experiments.	2018	
Procurement of commercial feed for <i>P. indicus</i> in ponds and monitoring of mortality of the wild breeders in the hatchery during production.	2018-2019	
Study on replacers for soybean meal in formulation for high value species	2018	
Study on methods to prevention or mitigate the effect of diseases in mud crab culture	2016-2018	Ongoing (Year 2)
Effects of Poly- $\beta$ -hydroxybutyrate-accumulating <i>Bacillus</i> species on the water quality and thermal stress response of <i>P. monodon</i> postlarvae during culture	2018	SEAFDEC/AQD-funded study

##### 4.2 Expected Outcomes/Outputs

###### Nutrition and Feed Development

- Proposed confirmatory runs of studies conducted
- Use of the algae, thraustochytrid, as a protein source for the abalone diet pursued
- Replacement studies for soybean meal using different sources be proposed/conducted in formulations for high value species

###### Prevention and mitigation of diseases in mud crab culture

- Viral load (WSSV) in water/soil/mudcrab that would result in infection/mortality quantified using qPCR;
- Environmental parameters that would affect infection/mortality identified
- Epidemiological data generated

Effects of Poly- $\beta$ -hydroxybutyrate-accumulating *Bacillus* species on the water quality and thermal stress response of *P. monodon* postlarvae during culture

- Bioremediation activity of PHB-accumulating *Bacillus* on the water quality of *P. monodon* postlarvae (PL) culture specifically the removal of ammonia, nitrite and nitrate determined
- Effects of PHB-accumulating *Bacillus* spp. On the growth, survival, and mRNA expression of hs70 and proPO in *P. monodon* PL exposed to high water temperature (35°C) elucidated
- Effects of PHB-accumulating *Bacillus* spp. on the survival of *P. monodon* PL exposed to high water temperature (35°C) and subsequently challenged with VPAHPND strain examined.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Maintaining Environmental Integrity through Responsible Aquaculture

**Responsible Department:** SEAFDEC/AQD

**Total Duration:** 2016-2020

**Funding Sources:** Philippine Government, ACIAR, DOST

**Estimated Budget for 2018:** USD 134,309

### 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 with the goal of developing environment-based aquaculture technology through integration of environmental factors in AQD's research activities to maintain environmental integrity by promoting responsible aquaculture. Projects undertaken involves evaluation of species appropriate for integrated multitrophic aquaculture (IMTA) wherein extractive species can reduce organic and nutrient loading from aquaculture. Another approach is to develop and promote innovations or modifications of culture systems to more environment-friendly ones. To address depletion of natural stocks of commercially important commodities, studies on species with potential for resource enhancement are also a focus of this program.

### 2. PROJECT

#### 2.1 Goal/ Overall Objectives

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 specific objectives are to:

- 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

#### 2.2 Outcomes and Expected Outputs

- Available data on impact of aquaculture on biodiversity
- Scaled-up production of juveniles of sandfish
- Firmed-up partnership with communities on sandfish seed production
- Socio-economic, political conditions at sea ranch sites for sandfish established
- Improved growth and survival of abalone using improved artificial diet and seaweeds
- The best culture environment for abalone by comparing growth and survival in pond, land-based tanks and small island reef farming determined
- Best practices for oyster farming developed
- Feasibility of grow-out of freshwater prawns in biofloc system determined.
- Production characteristics of lake-based grow-out of giant freshwater prawn after claw ablation determined
- Culture conditions of *Caulerpa lentillifera* optimized
- The technology for production of *Kappaphycus alvarezii* demonstrated.
- Production technology for *K. alvarezii* transferred and demonstrated to farmers in Batbatan, Culasi, Antique
- Effectivity of *K. alvarezii* as fertilizer for cacao determined

### 2.3 Project Description/Framework

**Activity 1:** Conduct studies on biodiversity in mariculture sites and in inland water bodies with aquaculture activities

**Activity 2:** To determine capacity of extractive species to absorb/utilize nutrients in culture systems studies such as those that determine bioremediation potential of seaweeds in shrimp ponds and feasibility of seaweed-shrimp polyculture; studies on integrated culture (high value fish, milkfish/siganid, seaweeds, shrimp) needs to be conducted

**Activity 3:** To develop and promote efficient and suitable environment-friendly culture systems, farming protocols for several aquatic commodities need to be investigated. Training and information dissemination activities to address issues on CCRF on ASEAN member states must also be developed and implemented. The compliance of farms in SEAFDEC member countries with CCRF also needs to be assessed.

**Activity 4:** Ecological and biological studies other species for resource enhancement (other than seahores)

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2017

Project/Activity Title	Duration	Remarks
<b>Develop and Promote Efficient and Suitable Environment-Friendly Culture Systems</b>		
<b><i>Refinement of existing oyster grow-out techniques</i></b>		
The final phase of the project established the appropriate site to achieve the best production ( <i>e.g.</i> high growth and survival rates) of oyster.	2014- 2017	DOST-funded
<b><i>Grow-out of abalone in small islands and/or community</i></b>		
Abalone are best cultured in PVC pipes in both tank and reef flat. In both culture environments, abalone performed best at 200 pcs/m <sup>2</sup> stocking density based on results of the last experiments conducted.	2014-2017	DOST-funded
<b><i>Culture trials for sandfish <i>Holothuria scabra</i> in ponds and sea ranch</i></b>		
A project evaluation workshop was held in Concepcion, Iloilo Province, Philippines in March 2017 participated by stakeholder groups from the (1) local government units; (2) Academe and (3) the community. Project performance rating was high in terms of "Environment improvement: by all groups with a score of 8.0 to 9.0 (for a maximum possible score of 10). Likewise, a high rating was achieved in terms of "Increase in fisheries stocks" were given by the LGU and Community groups (9.75-10) but were rated lower by the Academe group (7.6), indicating that stocks were qualitatively observed to increase by fishers but were limited in quantitative data from actual monitoring. "Community Participation" and "Government Support" also had some of the low rating of 7.4 and 6.8, respectively, by the Academe group, indicating that more focus on social linkages need to be developed in future engagements. Some of the recommendations as output of the workshop include (1) Strengthen law enforcement and support from LGU; (2) Further IEC activities to all stakeholders; (3) Increase and enhance the capacity of the NIPSC (a local fisheries college) hatchery; and (4) Consider other sites for establishment/expansion of sea ranch areas and/or nurseries.	2014-2017	ACIAR-funded
<b><i>Cage Culture of Polychaetes in Brackishwater Pond</i></b>		
Modular polychaete cage culture techniques developed in tanks is still being verified using cages in brackishwater ponds. An indoor nursery experiment is likewise still being conducted. Experiments toward the production of <i>M. mossambica</i> in ponds using straight-run culture method is still ongoing.	2017	Feeding trials shall commence in October.
<b><i>Giant freshwater prawn culture in biofloc</i></b>		
After 6 months of culture, no significant differences in mean weight, daily growth rate and specific growth rates was observed among the three stocking densities tested. However, survival was significantly	2015-2017	

Project/Activity Title	Duration	Remarks																								
<p>different among treatments with highest survival at the lowest stocking density and lowest survival at the highest stocking density. FCR was lowest (3.23) at 60 prawns/m<sup>2</sup>, but there was no statistically significant difference in FCR between the 30 and 40 prawns/m<sup>2</sup> treatments at 2.03 and 2.15, respectively.</p>																										
<p><b><i>Giant freshwater prawn culture in lake-based cages: Strategies to improve production through stock manipulation and management</i></b></p>																										
<p>At the second month, significant difference in mean weight of prawns was already apparent with bigger prawns in the lowest stocking density. Prawns in TRT2 and TRT3 were divided into two cages at the second month immediately after sampling. At the third month of sampling, there was still significant difference in the mean weight of prawns from the different treatments with inverse relationship with weight and stocking density. By the fourth month, there seems to be recovery of the weight prawns from the original TRT2 since no significant difference was observed with TRT1. However, the original TRT3 prawns still had the lowest mean individual weight. Daily growth rate and specific growth rates followed the same statistical trend as the mean individual weight. However, even at the fourth month, there was no significant difference in the survival of the prawns.</p>	2016-2018																									
<p><b><i>Culture of Caulerpa</i></b></p>																										
<p>Application rate of fertilizer was determined using a combination of 16-20-0 and urea. Tables below are parameters after 30 days of <i>Caulerpa</i> culture.</p> <p>Length of vertical branch of <i>Caulerpa</i> in tanks.</p> <table border="1"> <thead> <tr> <th>Application of fertilizer</th> <th>Length (cm) vertical branch</th> </tr> </thead> <tbody> <tr> <td>1x/day</td> <td>2 - 12.5</td> </tr> <tr> <td>2x/day</td> <td>3.5 - 14.5</td> </tr> <tr> <td>every 7 days</td> <td>4.0 - 13.0</td> </tr> <tr> <td>every 15 days</td> <td>1.0 - 8.5</td> </tr> <tr> <td>control</td> <td>1.5 - 8</td> </tr> </tbody> </table> <p>Growth of <i>Caulerpa</i> in tanks</p> <table border="1"> <thead> <tr> <th>Treatment</th> <th>SGR (% day<sup>-1</sup>)</th> </tr> </thead> <tbody> <tr> <td>1x/day</td> <td>4.32</td> </tr> <tr> <td>2x/day</td> <td>5.22</td> </tr> <tr> <td>every 7 days</td> <td>5.65</td> </tr> <tr> <td>every 15 days</td> <td>4.62</td> </tr> <tr> <td>control</td> <td>2.55</td> </tr> </tbody> </table>	Application of fertilizer	Length (cm) vertical branch	1x/day	2 - 12.5	2x/day	3.5 - 14.5	every 7 days	4.0 - 13.0	every 15 days	1.0 - 8.5	control	1.5 - 8	Treatment	SGR (% day <sup>-1</sup> )	1x/day	4.32	2x/day	5.22	every 7 days	5.65	every 15 days	4.62	control	2.55	2015-2018	
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<p><b><i>Kappaphycus alvarezii farming and its use as fertilizer for cacao tree</i></b></p>																										
<p>A 2-day on-site training for seaweed farmers from Batbatan Island, Culasi, Antique Province, Philippines was conducted at Paragon Resort, Culasi, Antique last 21-22 December 2016. Trainees were composed of 30 seaweed farmers. Topics on grow-out culture, common diseases, and updates on <i>Kappaphycus</i> culture were discussed. An open forum was also conducted right after the lectures. On the 2nd day, an on-site visit at Batbatan Island was done. Seaweed plantlets (200 pcs) were planted at Sitio Bunlao on two 10-m culture lines. Water parameters and water quality were also monitored during the visit.</p>	2016-2018																									

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2018

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Biodiversity studies in mariculture areas and inland waters used for aquaculture		No proponent yet but part of plans of action for 2016-2020
Bioremediation potential of seaweeds in shrimp ponds and feasibility of seaweed-shrimp polyculture		No proponent yet but part of plans of action for 2016-2020
Giant freshwater prawn culture in lake-based cages: Strategies to improve production through stock manipulation and management		Continuing study
Culture of <i>Caulerpa</i>		Continuing study
<i>Kappaphycus alvarezii</i> farming and its use as fertilizer for cacao tree		Continuing study
Strengthen law enforcement and support from LGU		
Further I.E.C. activities to all stakeholders;		
Increase and enhance capacity NIPSC (a local fisheries college) hatchery		
Consider other sites for establishment/expansion of sea ranch areas and/or nurseries.		

##### 4.2 Expected Outcomes/Outputs

- Scaled-up production of juveniles of sandfish
- Firmed up partnership with communities on sandfish seed production
- Socio-economic, political conditions at sea ranch sites for sandfish established
- improved growth and survival of abalone using improved artificial diet and seaweeds
- Production characteristics of lake-based grow-out of giant freshwater prawn in monosex and mixed culture system determined
- Culture conditions of *C. lentillifera* optimized
- Technology for the production of *K. alvarezii* developed, and demonstrated/ disseminated to farmers
- Compliance of farms in SEAFDEC Member Countries with CCRF assessed.
- Training and information dissemination to address issues on CCRF in SEAFDEC member countries conducted.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Adapting to Climate Change Impacts  
**Responsible Department:** SEAFDEC/AQD  
**Total Duration:** 2012-2020  
**Funding Sources<sup>1</sup>:** Philippine Government  
**Estimated Budget for 2018:** USD 157,358

### 1. INTRODUCTION

The changing global climate manifests its threats with more frequent and more intense extreme weather events experienced in recent years. Abnormal weather patterns or disturbances like extended hot and dry spells or intense drought and frequent heavy rains resulted to severe flooding, among others. These climate-related disturbances are projected to impact broadly across ecosystems increasing the pressure on all livelihoods and food supply chains, including the fisheries and aquaculture sectors. In particular, the sustainability of aquaculture will be further challenged since the effect of these climatic changes on farmed organisms is largely unknown. The different aquaculture systems, facilities, and support systems to aquaculture operations, as well as the fish farmers themselves will be affected. The small-scale fish farmers in the region that produce the great bulk of the aquaculture production are largely vulnerable. Mitigation and adaptive measures are therefore urgently needed to address the threats to food and livelihood provision that may arise due to the changing climatic conditions observed globally.

### 2. PROJECT

#### 2.1 Goal/Overall Objectives

The overall goal of the program is to 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 impacts of climate change in aquaculture, and ensure the continued operation of all aquaculture production systems under changing climatic conditions. The long-term objective of the program is to ensure that aquaculture production of important aquaculture commodities will continue even under conditions of higher temperature and more acidic waters for continuous supply of food fish and for income generation of people.

Specific objectives:

- Gather scientific information on the susceptibilities of various economically important aquaculture species to the combined effects of high seawater temperature and acidity
- Generate scientific data on the effects of abrupt changes in water temperature and salinity brought about by long dry spell followed by heavy rains in the outdoor production of natural live food organisms for hatcheries and for pond culture systems
- Promote awareness to the fish farmers and the general public on the possible effects of climate change to aquaculture operations
- Assist other government agencies in the country and in the region in gathering baseline information on aquaculture areas/sites that are most vulnerable to climate change effects/impacts
- Explore potential adaptive measures to mitigate the impact of climate change to the different aquatic farming systems
- Collaborate with other institutions in the country and in the region in gathering scientific information that will serve as basis for the formulation/design of alternative aquaculture systems that are adaptive to climate change.

## 2.2 Outcomes and Expected Outputs

- Areas in the region that are vulnerable to climate change-related effects will be identified and the kind of probable impacts will be determined so that appropriate adaptive measures can be proposed
- Fish farmers and the public will have better understanding about climate change and its likely impacts 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, series of experiments will be conducted to gather important s
- Scientific data gathered on the impact of climate change to the biology of aquatic species presently farmed and the support systems to aid in impact mitigation
- Improvements and innovations on aquaculture holding systems and structures

## 2.3 Project Description/Framework

**Activity 1:** Generate scientific information on the effects of high water temperature on the reproductive performance and recruitment of economically important marine aquaculture fishes

Considering the relatively narrow fluctuations in environmental parameters like water temperature in the tropical region, marine organisms living in this area are more susceptible to physiological effects of exposure to environmental conditions outside of the normal range, compared to organisms in the temperate areas. Reproduction, spawning and recruitment are among the physiological processes that are highly affected by environmental temperature.

**Activity 2:** Promote awareness on the possible effects of climate change to aquaculture operations

## 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2017

Project/Activity Title	Duration	Remarks
<p>Generate Scientific Information on the Effects of High Water Temperature on Economically Important Marine Fish</p> <p>An extended El Nino phenomenon observed in the Philippines from around the end of 2015 until the first half of 2016 led to prolonged dry and hot spells followed by extended periods of heavy rains. During this period, disruption in the reproduction of most of the commodities were observed <i>e.g.</i> decreased maturation rates and fewer spawning events in captive shrimps, abalone and crabs, decreased production of cocoons in both wild and captive polychaetes, <i>Marphysa mossambica</i> among others. Growth and survival of different commodities were also affected. Growth of <i>Kappaphycus</i> in the nursery and grow-out were lower during the El Nino months, whereas <i>Caulerpa</i> showed slow growth especially towards the end of the El Nino months and the onset of the rainy season when extended periods of heavy rainfall (and fluctuations/drop in salinity) was experienced when negative growth rates were recorded.</p> <p>Development of nectochaetes was also affected by exposure to sunlight (and hence, temperature). Better growth and survival was obtained in nectochaetes cultured indoors, followed by those cultured in a partially shaded area. Poor growth and survival were recorded for nectochaetes culture in an area that is directly exposed to sunlight. These observations point to the need for developing strategies or systems that would support normal growth and development under unfavorable or sub-optimal conditions brought about by climatic phenomena.</p>	2012 - present	
Promote Awareness on the Possible Effects of Climate Change to Aquaculture Operations	2012 - present	

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
All training courses offered by AQD have included a lecture on the impacts of climate change on aquaculture and strategies towards resiliency. The AQD Library is continuously compiling relevant updates and new information about the effects of climate change to aquaculture for easy access to interested stakeholders. AQD supported and participated in the series of workshops on Climate Resilient Aquaculture Operations organized by the Bureau of Fisheries and Aquatic Resources. The Department also provided expertise during a National Review and Calibration of Climate Change R&D Program of the Philippine Government in September 2017. Likewise, AQD will be attending the FAO Regional Consultation on Climate Resilient Fisheries and Aquaculture in the Asia-Pacific Region this November.		

#### **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2018**

##### **4.1 Planning of the Project Activities**

<b>Project/Activity Title</b>	<b>Duration</b>	<b>Remarks</b>
Continue investigating the effects of wide and abrupt temperature, acidity levels and salinity fluctuations on susceptibility and performance of various economically important cultured species	2018-2020	
Conduct trials to develop breeding and seed production and culture techniques for candidate resilient species	2018-2020	
Conduct survey of sites and areas used for aquaculture activities in the country and the region that are most vulnerable to climate change	2018-2020	

##### **4.2 Expected Outcomes/Outputs**

- Effects of wide and abrupt temperature, acidity levels and salinity fluctuations on susceptibility and performance of various economically important cultured species established
- Breeding and seed production and culture techniques for resilient species developed and promoted
- Exchange of information on climate change impacts to fisheries and aquaculture
- Identification of aquaculture sites in the Philippines and the region that are most and vulnerable to climate change

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Meeting Social and Economic Challenges in Aquaculture

**Responsible Department:** SEAFDEC/AQD

**Total Duration:** 2012-2020

**Funding Sources:** Philippine Government, ACIAR, DOST

**Estimated Budget for 2018:** USD 145,228

### 1. INTRODUCTION

This program recognizes the need to secure food and income by developing and implementing social and economic strategies in aquaculture and resource management through collaboration with stakeholders. It is aimed that these strategies will overcome the unintended problematic scenarios brought about by the development of aquaculture, such as: 1) inequitable distribution of opportunities and benefits across adopters of aquaculture; 2) technology and production cost dualism among aquaculturists; 3) social conflicts and economic losses due to competing uses of resources for aquaculture and other purposes; and 4) high cost of rehabilitation of habitats affected by misuse of natural resources for aquaculture.

### 2. PROJECT

#### 2.1 Goal/ Overall Objectives

The MSECAP aims to address the recommendations which were adopted during the June 2011 ASEAN-SEAFDEC Fisheries Conference on the following areas:

- Prioritize 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
- Allocate 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
- Enhance multi-agency collaboration, sharing of information and resources to alleviate the socioeconomic conditions of the poor sector of the region

#### 2.2 Outcomes and Expected Outputs

- Improved collaboration among aquaculture stakeholders through community-based (CB) strategies, *i.e.* fisherfolks, local government and scientific research organizations
- Fisherfolks trained on CB methodologies for implementation and sustain results
- LGUs committed to adopt improved fisheries governance strategies
- Developed strategies to sustain socioeconomic benefits from aquaculture-based production systems such as Community-Based Resource Enhancement (CBRE) and Integrated-Multi Tropic Aquaculture (IMTA)
- Improved understanding of climate change indicators and mitigation strategies among seaweed farmers

#### 2.3 Project Description/Framework

**Activity 1:** Collaborative R&D in aquaculture that promotes the two-pronged role of aquaculture through production of hatchery reared (HR) seeds for: 1) grow-out to increase fish food production (*i.e.* through promotion of IMTA of fed milkfish with filter-feeding sandfish and nutrient-absorbing seaweeds); and 2) stock enhancement in CBRE of HR abalone, *Haliotis asinina*, and sandfish, *Holothuria scabra* projects in Sagay Marine Reserve in Negros Occidental, and CBRE of HR tiger shrimp *Penaeus monodon* in New Washington Estuary (NWE) in Aklan province.

**Activity 2:** Allocating R&D resources to address emerging issues on the impacts of climate change and global trade on aquaculture done with small-scale seaweed farmers in Brgy Panobolon, Nueva Valencia in Guimaras Province.

**Activity 3:** Multi-agency collaboration and sharing of information done with local partner LGUs, fisherfolk associations in areas where studies are conducted.

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2017

Project/Activity Title	Duration	Remarks
Collaborative R&D in aquaculture that promotes the two-pronged role of aquaculture through production of hatchery reared seeds <b><i>Hatchery-reared seeds for grow-out to increase fish food production</i></b>		
The IMTA in Guimaras Province, Philippines provided economic benefits to fisherfolk trained to grow and sell milkfish, women trained to debone and cook milkfish sardines, and school children fed with milkfish sardines. Sales proceeds are rolled over to sustain operations even after donor exit. However, sandfish and seaweeds in IMTA system were not sustained due to predation and diseases.	2015 to present	JIRCAS
<b><i>Stock enhancement in Community-Based Resource Enhancement (CBRE) of hatchery-reared abalone and sandfish</i></b>		
<u>Sagay Marine Reserve</u> Fisherfolks benefited from harvest of spill-overs from released abalone and sandfish in the CBRE site while the LGU and fisherfolk association continue to manage the CBRE project. The CBRE project participated in the <i>Sustainable Seafood Week</i> campaign of high-end gourmet establishments.	2006 to present	GOJTF 5 and 6
<u>New Washington Estuary</u> Some released tiger shrimp grew to marketable sizes, but majority were prematurely caught by illegal fine mesh nets that should be regulated by local government. Project evaluation workshop was conducted with stakeholders to improve future strategies.	2012- 2017	RIHN
<b>Allocating R&amp;D Resources to Address Emerging Issues on the Impacts of Climate Change and Global Trade</b> Small-scale seaweed farming in Guimaras affected by lack of planting materials and diseases. High daily temperature variation recorded in January 2017 (10.1°C) coincided with ice-ice disease and slow growth reported by seaweed farmers. Recorded salinity from 35.15 to 37.26 ppt were within range of seaweed requirement.	2016-2017	
<b>Multi-agency Collaboration and Sharing of Information</b> This was done with local partner LGUs and fisherfolk associations in areas where studies are conducted. Tri-party collaboration involving 1) organized fisherfolks, 2) local government, and 3) research institution in IMTA in Guimaras and CBRE project sites in Negros Occidental and Aklan provinces successfully demonstrated, promoted, and achieved social and economic objectives. Initiated replication of CBRE sites in Sagay and other potential remote coastal communities in Camarines Sur Province through a local state university.	2006 to present	

### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2018

#### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Continue existing 5-year CBRE study in Sagay Marine Reserve	2015 - 2019	funded by GOJTF6
Continue existing 5-year IMTA study in Guimaras	2016 - 2021	funded by JIRCAS
Collaborative CBRE of tiger shrimp in New Washington Estuary	2017 - 2020	MOA to be signed with BFAR-R6

## 4.2 Expected Outcomes/Outputs

### CBRE in Sagay Marine Reserve

- Establishment of solar-powered abalone hatchery in Molocaboc Island in Sagay, Negros Occidental
- Abalone and sandfish larval dispersal study
- Investigation of sandfish mollusk parasite
- Development of further CBRE exit strategies
- Socioeconomic impact assessment evaluation

### Integrated Multi-Trophic Aquaculture

- Improvement of economic benefits from increased survival of sandfish and seaweeds
- Sustaining economic benefits and entrepreneurial skills of fisherfolks, including women

### CBRE in New Washington Estuary

- Improved governance, alternative livelihoods and compliance to mesh net regulations
- Increased economic benefits from further releases of tiger shrimp reared in *Kapispisan* sanctuary and BFAR ponds
- Sustainable CBRE of tiger shrimp embedded in fisheries development plans of municipalities

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Promotion on Strengthening of SEAFDEC Visibility and Image  
**Responsible Department:** Training Department  
**Total Duration:** 2018  
**Funding Sources:** Training Department  
**Estimated Budget for 2018:** 50,000 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, 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

Expected Outputs

- Understanding on role and SEAFDEC / Departments activities
- Delivery of fisheries information to stakeholders and the public
- Hub of fishery information 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 and information staffs**

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.

**3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2017**

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 on "Prevent IUU Fishing in the ASEAN region" was organized in collaboration with Fish Marketing Organization with focused on: what is IUU fishing, and forms of IUU fishing activities in Southeast Asian region in the event of "Chatuchak and Fish Market"	22-26 May 17	
- Exhibition at the annual national fair "Pramong Nomklao" was organized in collaboration with the Thai Department of Fisheries. TD presents "Remotely Operated Vehicle (ROV) for Fisheries Resources Survey" through demonstrated the ROV in the test tank and the children also trial to drive the ROV-kit. Moreover, the distribution of various technical publications, brochures, VCDs and fishery-related souvenirs to the audiences, the SEAFDEC visibility was promoted	30 June-9 July 17	
- Special event on SEAFDEC Mini-marathon to celebrate of 50 <sup>th</sup> anniversary of SEAFDEC and promotion of SEAFDEC visibility	Will be organized on 24 Dec 17	
2) Production of Information Materials - Two issue 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 to enhance fisheries knowledge and public relation of TD and implementation activities.	Jan and May 17	
- Animation Cartoon story as "Story of a boy named POR" was promoted to the social media and website	July 17	
3) Management Information System - Maintenance and update TD website and integration website	Jan-Dec 17	
- TD collaboration with Secretariat is developing ACDS database	Jan-Dec 17	
- Development of TD repository	Jan-Dec 17	
- Development of database on fishing license and vessels registration to support Cambodia in combating IUU fishing	Jan-Dec 17	

Project Activity Title	Duration	Remarks
4) Human capacity building for SEAFDEC and information staff - A Library Officer attends On-the-job training on Utilization of Library to develop her skill and apply to her information work.	Jul 17	
- A Training and Extension staff attend training course on “Professional Trainer” to develop their skill and apply to their work	1-3 Aug 17	
- An information staff attend training course on “Effective Writing for Organizational Communication” to develop their skill and apply to their work	17-18 Aug 17	
- Annual SEAFDEC seminar to development and enhancement skill of writing and presentation on research activities for SEAFDEC staff.	Will be organized in 15 Jan 18	

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2018

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<b>Activity 1: Promotion and Enhancement of SEAFDEC Visibility and Image</b> 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	
<b>Activity 2: Production of Information Materials</b> - 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, <i>etc.</i>	Jan-Dec	
<b>Activity 3: Management Information System</b> 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	
<b>Activity 4: Human capacity building for SEAFDEC information staff</b> The knowledge, skill and experience of SEAFDEC especially information staff will be enhanced and developed by relevant ICT training program with outside institutions such as strategy of Public Relation, website design, <i>etc.</i> Moreover, skill of writing and present on research activities for SEAFDEC staff will be developed and enhanced via annual SEAFDEC seminar.	Jan-Dec	

##### 4.2 Expected Outcomes/Outputs

- Strengthening of SEAFDEC and Departments visibility and image
- Understanding on role and SEAFDEC / Departments activities of public
- Delivery of fisheries information to stakeholder and public

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Tailor-made Training Programs  
**Responsible Department:** Training Department  
**Total Duration:** 1 year (2018)  
**Funding Sources:** Training Department  
**Estimated Budget for 2018:**

### 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 and Performance Indicators:

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 Expected Outcomes and 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 2017

#### 3.1 Activities Achievements in the Year 2017

Achievements based on Activities	Duration	Remarks
1. The Short-term Training Course for University Students on Ecosystem Approach to Fisheries Management" (Batch-60). The training course was conducted at SEAFDEC/TD, there were 28 students from eight difference Universities attended in the training course.	11 days 6-16 June 2017	
2. A long-term training course on fishing operation for Tinsulanonda Fisheries College. This training course is conducted under the collaboration between TD and the Office of Vocational Education Commission. The training is a part to support the country in producing seamen and navigators for fisheries industrials of Thailand. There were 21 students attending on this training course for this batch.	4 months, from 4 Oct 2016 to 17 Feb. 2017.	
3. The Training Course on Fishing Gear Drawing by using Corel Draw Program. There were 14 participants attended in the training course.	5 days 28 August -1 September 2017	

### 4. PROPOSED ACTIVITIES FOR THE YEAR 2018

At least three tailor-made training programs will be conducted in the year 2018. (The course titles, programs and activities will be designed base on the requirements/needs from the training partners).

#### 4.1 Expected Outcomes/Outputs of the Year 2018

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.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Improving of Fisheries Technology and Reduction of the Impact from Fishing

**Responsible Department:** Training Department

**Total Duration:** 2018-2019

**Funding Sources:** Department of Fisheries, Thailand

**Estimated Budget for 2018:**

### 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 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 main components of activities are slightly adapted title 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. Database for fisheries management

### 2. PROJECT

#### 2.1 Goal /Overall Objectives

- To apply the multidisciplinary research on fisheries resource, fisheries environment, fishing technology and socioeconomic to mitigate impact of fisheries to marine ecosystem.
- 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
- 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 a limited scope study in partnership with relevant institute, agencies. SEAFDEC/TD in collaboration with Department of Fisheries, and Fish Marketing Organization, Thailand had finished carrying out the improvement of fishing port facilities in Rayong Province, eastern part of Gulf of Thailand and Bangkok Fishing Port. There are five (5) sub-activities under this program as follows;

- 1.1. Study on improvement of fishing technology to sustain marine fisheries resource utilization
- 1.2. Research on coastal fishing activities, *e.g.* set net, bamboo stake trap, for specific proposes, *e.g.* fish sampling.
- 1.3. Advanced Sustainable Technology: Remotely Observation Vehicle and Underwater camera system for fishing operation observation
- 1.4. Improvement facilities of the fishing ports
- 1.5. Improve reference for fishing technology
  - a) Human Resources Development and improve the 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

This program has been focused on impact of fishing practices to marine ecosystem. Activities have been jointly implemented by SEAFDEC, Department of Fisheries Thailand and relevant institute & agencies *e.g.* RIHN (Research Institute of Humanity and Nature), and Department of Marine Technology of Burapha University, aiming to monitor the change of bottom sediment around the set net area and monitoring discards and garbage in small-scale gillnet fisheries operating in the coastal area of Rayong Province. There are 2 Sub-activities under this program as follows;

- 2.1. Research on environmental impact from fishing operation.
- 2.2. Study on bycatch and discards from fishing operation

#### **Activity 3:** Database for fisheries management

SEAFDEC Training department in collaboration with Department of Fisheries, Thailand has developed database system for managing data from the cruise resource surveys. The activities aimed to harmonize data collection for the research cruise survey on fisheries resources between DFTRDI 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). SEAFDEC/TD in collaboration with Department of Fisheries Thailand has verified the systematic data collecting, data storage, manage and sharing in order to improve national database for data 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 2017**

<b>Project/Activity Title</b>	<b>Output</b>	<b>Remarks</b>
1. Study on the energy use in fishing practices 1.1. Study on the Energy Audit for trawlers in the Gulf of Thailand 1.2. Study on Feasibility to improve Deck Machinery for Fisheries installed in Thai fishing vessels, socioeconomic and fishing technology perspective	1.1. Report submit to FAO 1.2 Complete preliminary survey	
2. Advanced Sustainable Technology: Remotely Observation Vehicle and Underwater camera system for fishing operation observation 2.1. Develop the collaborative improvement on Remotely Observation Vehicle Phase-2	Complete ROV improvement with well function and more accessories instruments	Continue to develop new MOU with relevant institutes

Project/Activity Title	Output	Remarks
3. Manual for fishing technology 3.1. Human Resources Development on Specific Detail of Fisheries Management for Provincial and Port-In and Port-Out (PIPO) Officers of Thailand 3.2. Human Resources Development on fishing gear drawing by application program Improve reference for fishing technology subject for undergraduate student of Thailand	3.1. Complete in Rayong and Songkla  3.2. Training is complete in September 2017	
4. Fishing technology improvement to specific purposed, <i>e.g.</i> reducing man-power in fisheries, fish sampling, and etc. 4.1. Set net installation in coastal zone to collect fish sampling for specific proposes 4.2. Technical support to Department of Fisheries Thailand to formulate Fisheries Management Plan in Trat Province	4.1. No requesting in year 2017 4.2. Practical workshop on EAFM at Trat Province	
5. Improvement on fishing port facilities	Finish first phase with FMO	
6. Study on bycatch and discards from fishing operation 6.1. Study on Bycatch in Bottom Gillnet Fisheries along the Coast of Rayong Province, Thailand	Report on progress	
7. Development of database system for management of data from the cruise surveys	On-process	

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2018

##### 4.1 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. Research on coastal fishing activities, *e.g.* set net, bamboo stake trap, for specific proposes, *e.g.* fish sampling.
- 1.3. Advanced Sustainable Technology: Remotely Observation Vehicle and Underwater camera system for fishing operation observation
- 1.4. Improvement facilities of the fishing ports
- 1.5. Improve reference for fishing technology
  - a) Human Resources Development and improve the 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 impact of social well-being and livelihood from fishing activities

**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

## 4.2 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p><b>Activity 1:</b> 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, e.g. set net, bamboo stake trap, for specific proposes, e.g. fish sampling.</p> <p>1.3. Advanced Sustainable Technology: Remotely Observation Vehicle and Underwater camera system for fishing operation observation</p> <p>1.4. Improvement facilities of the fishing ports in coordinate with DOF and FMO Thailand</p> <p>1.5. Improve reference for fishing technology</p> <p>a) Human Resources Development 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 reference 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 2018	<p>Wait for request from DOF</p> <p>Wait for the 2<sup>nd</sup> Memorandum of Understanding</p> <p>Wait for request from DOF</p>
<p><b>Activity 2:</b> Study on the impact on fisheries resources, marine environmental, social well-being and livelihood from fishing activities</p> <p>3.1. Research and study on the status and impact of fisheries oceanography and marine environmental from fishing operation</p> <p>3.2. Research and study on bycatch and discards from fishing operation</p> <p>3.3. Research and study on impact of social well-being and livelihood from fishing activities</p>	Jan - Dec 2018	
<p><b>Activity 3:</b> Database for fisheries management</p> <p>4.1. Development of database system for fisheries resources survey</p> <p>4.2. Development of database system to support fisheries socio-economic and small-scale fisheries study</p>	Jan - Dec 2018	

## 4.3 Expected Outcomes/Outputs

- 1) Study report on modification of purse seine fishing technology to reduce manpower
- 2) Report on deck machinery for fisheries installed in Thai fishing vessels
- 3) Memorandum of Understanding on the collaborative improvement on Remotely Observation Vehicle Phase-2 and Underwater camera system of SEAFDEC/TD for observing fishing operation.
- 4) Identify the present problems to improve fishing port facilities.
- 5) Study report on feasibility to improve deck machinery for fisheries installed in Thai fishing vessels, socioeconomic and fishing technology perspective
- 6) Improved curriculum and activity report on the Human Resources Development on Specific Detail of Fisheries Management for DOF Officers
- 7) Improved curriculum of fishing technology subject for staffs of the Department of Fisheries and undergraduate student of Thailand
- 8) Documents as reference for fishing technology for undergraduate students of Thailand
- 9) Database system from the cruise surveys and improvement plan
- 10) Database system to support research on the fisheries socio-economic and small-scale fisheries

**OTHER PROGRAMS**

**PROJECT DOCUMENT**  
**ACHIEVEMENTS FOR YEAR 2017**  
**AND**  
**PROPOSED ACTIVITY FOR YEAR 2018**

			Project id: 201506006
<b>Program Category:</b>	Other Program		
<b>Project Title:</b>	Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region		
<b>Lead Department:</b>	TD and Secretariat	<b>Total Duration:</b>	May 2015 – Dec 2017
<b>Donor/Sponsor:</b>	ACIAR	<b>Total Donor Budget:</b>	AUD 150,000
<b>Project Partner:</b>	DOF Thailand	<b>Budget for 2017:</b>	AUD 50,000
<b>Project Leader:</b>	Dr. Chumnarn Pongsri	<b>Involved Country:</b>	Thailand as implementation site

## 1. INTRODUCTION/BACKGROUND

Inland capture fisheries in the Southeast Asian region including Mekong River Basin deliver food security and income for rural households and also serve as a valuable source of protein and important micro-nutrients. Nevertheless, inland fisheries are becoming increasingly threatened by riverine development projects. Construction of cross-river obstacles such as dams, weirs, roads, etc. as means for rapid development in response to increasing population and demand for agriculture products, hydropower generation or urbanization, are major threats to the long term sustainability of inland capture fisheries as any changes in migration, reproduction and biodiversity of aquatic populations has the potential to decrease capture fisheries productivity. Appropriate mitigation measures to alleviate possible impacts from such migration barrier are therefore necessary.

Fishways have been constructed worldwide and have proved to help mitigate many fisheries globally. Nevertheless, in order to assure the effectiveness of the fishway, it is important that fishway design criteria are established for local species and conditions of the specific region, and not adopted from studies conducted elsewhere.

SEAFDEC in collaboration with the Department of Fisheries of Thailand therefore proposed the project on “Application of fish passage design principles to enhance sustainability of inland fishery resources in the Southeast Asian region” to be implemented for the period of 16 months starting from May 2015 with funding support from the Australian Centre for International Agricultural Research (ACIAR). The Agreement for this collaborative project was approved by the SEAFDEC Council (by *ad referendum*) in April 2015. Under this project, fishway model would be designed in such a way that critical parameters, e.g. slope, water flow/velocity, pass dimension, etc. could be adjusted, in order to determine the most appropriate design for various conditions. Experiments would be conducted on-station, using selected indigenous fish species. It is expected that the research results would provide basic information on the considerations for designing of fish passes that could be applied for different localities of the Southeast Asian region.

At the end of the project originally scheduled at the end of September 2016, extension of the project was approved by ACIAR until March 2017, and subsequently until December 2017 to undertake more experiment to come up with information that could fulfil the project objectives.

## 2. PROJECT

### 2.1 Goal/Overall Objectives

The project aims to apply the principles of fishway design more broadly throughout the Southeast Asian region. Specifically the project will:

- 1) Develop a regional collaborative approach on fish passage through the conduct of an expert workshop;
- 2) Design and construct experimental fishway facilities in Thailand; and
- 3) Provide a pathway for further research to improve knowledge on appropriate designs that could facilitate upstream migration of indigenous fish.

## **2.2 Expected Outcomes and Outputs**

The ultimate outcomes of the project are:

- 1) Greater regional collaboration on fish passage issues;
- 2) An agreed list of design criteria for experimental facilities;
- 3) The construction of an experimental facility in an accessible location; and
- 4) The ability to demonstrate fishway facilities to management agencies and other interested parties.

The major project outputs include:

- 1) Paper summarizing outcomes from an expert panel workshop;
- 2) List of engineering designs for experimental facilities;
- 3) A commissioning report outlining facility success; and
- 4) Final project report.

## **2.3 Project Description/Framework**

### **Activity 1. Conduct of expert workshop on fishway design**

An expert workshop on fishway design would be convened to review available information on fish migration biology and ecology in Southeast Asia. Available information on fishway design worldwide would also be reviewed. Based on such information, the workshop would determine fishway designs that are most likely to succeed for the region, with a range of criteria required to develop terms of reference for facility construction.

### **Activity 2. Preparation of engineering designs and construction of fishway model**

The project team will select an appropriate site in Thailand for installation of fishway facility based on the criteria agreed during the expert workshop. Engineering design of fishway models, with elaboration of factors such as slope, construction material, expected operating life, an operations and maintenance manual, key construction materials required and expected construction time, would be prepared. Upon agreement of the experts attending in the workshop, construction of experimental facility would be pursued.

### **Activity 3. Undertaking of pilot commissioning**

The final activity is to commission the experimental fishway unit and ensure it performs to design specifications. At this stage, minor modification of the construction could be properly made to enhance effectiveness in its operation. Panel of selected experts could be convened to perform a physical inspection and review of the fishway construction. The unit would then be trialed to ensure it performs hydraulically and ecologically. Experiment would also be conducted to see its applicability to facilitate upstream migration of fish.

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2017

#### 3.1 Activities Achievements in the Year 2017

Project/Activity Title	Duration	Remarks
<p><b>Activity 1. Conduct of expert workshop on fishway design</b></p> <p>Report of the “Experts Workshop on Fishway Design Principles to Enhance Sustainability of Inland Fishery in the Southeast Asian Region” organized on 6-10 March 2016 in Thailand and Lao PDR was published and disseminated to the Workshop participants.</p>	Q2	100%
<p><b>Activity 2. Preparation of engineering designs and construction of fishway model</b></p> <p>Based on the fishway model constructed at TD since 2015 with the fixed slope at 11 degrees, TD is improving the design in order to enhance the use of the fishway model by:</p> <ul style="list-style-type: none"> <li>- Modification of foundation, fish way and fish pool;</li> <li>- Installation of hydraulic components to enable adjustment of fishway slope; and</li> <li>- Installation of monitoring tools and data collection devices.</li> </ul> <p>After testing, another set of fishway model would also be replicated/constructed at the station of DOF Thailand in order to facilitate more experimental trials in the future.</p> <p>For acrylic mini-model of fishway, the design would also be improved to make it more portable and easier for demonstration.</p>	Q4	80%
<p><b>Activity 3. Undertaking of pilot commissioning</b></p> <p>After improvement of fishway model at TD, the model would be used for experiment trials (Experiment in 2017 would use wild-caught fingerlings collected by DOF Thailand, while experiment previously conducted in 2016 was based on hatchery-bred fingerlings). In this regard, a working session is tentatively scheduled on 4-8 December at TD (in Thai), with participation of researchers from DOF Thailand, with objectives of discussion on engineering design aspect, conducting experiment trials, and concluding results from research trials.</p>	Q4	20%
<p><b>Other</b></p> <p>The project supported staff from IFRDMD to attend in the 147<sup>th</sup> <i>American Fisheries Society conference</i> which was held in Tampa, Florida from 18-24 August 2017. Poster presentation was displayed to inform the participant regarding the SEAFDEC-ACIAR project activities.</p>	Q3	100%

### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2018

The Project would be completed in 2017.



**Annex 8**

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

<b>Project Title</b>	<b>Lead Deaprtment</b>	<b>Period</b>	<b>Appendix No.</b>
Strengthening the Effective Management Scheme with GIS (Geographic Information System) & RS (Remote Sensing) Technology for Inland Fisheries and Aquaculture at AMS	SEC	1 year	1
SEAFDEC-EU/CITES Sharks Project Phase II	SEC	1 year	2

## CONCEPT NOTE ON STRENGTHENING THE EFFECTIVE MANAGEMENT SCHEME WITH GIS (GEOGRAPHIC INFORMATION SYSTEM) & RS (REMOTE SENSING) TECHNOLOGY FOR INLAND FISHERIES AND AQUACULTURE AT AMS

**Project Title:** Proposal to JAIF: Strengthening the effective management scheme with GIS (Geographic information system) & RS (Remote sensing) technology for inland fisheries and aquaculture at AMS

**Project Funding Agency:** Japan-ASEAN Integration Fund (JAIF)

**Lead Department:** Secretariat

**Project Budget:** Total budget 270,000 USD (pending)

**Duration:** 1 year

### 1. BACKGROUND/INTRODUCTION

Inland fisheries and freshwater aquacultures in the Southeast Asia region as major fish producers have provided various kinds of fish products to the world-wide markets. In Southeast Asia, the inland fishery and aquaculture are important field, which have much production volume compared to other areas.

On the other hand, inland fishery resources, unlike marine fishery resources, are affected by seasonal environmental factors such as rainfall and water temperature and catch pressure by fishery. As a result, this has often impeded the appropriate fisheries and aquaculture management 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 GIS&RS technology, it became possible to grasp the environmental changes of environmental factor in the habitats of aquatic organisms affecting of inland fishery resources. Considered those issues on inland fisheries and aquacultures, this project, with GIS & RS technology, Makes GIS mapping on inland fishery and aquaculture sites in AMS and proposes monitoring methodologies with the GIS Mapping in order to enables the AMSs government to effectively manage the inland fisheries and aquaculture project period is going to be implemented by Southeast Asian Fisheries Development Center (SEAFDEC) for one year.

This project is 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)”.

### 2. JUSTIFICATION

#### 2.1 Problem Analysis

Freshwater fishery resources are greatly affected by changes in the environment. It is necessary to manage the inland fisheries resources and to use them sustainably while taking environmental factors into consideration. However, its management method has 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.

#### 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.
- If the impact of environmental factors on inland fishery resources grasped by GIS&RS technology, management methods for effectively utilizing inland fishery resources are supplied to AMS countries.

### **2.3 Participation**

- AMS (Government officers in the sections of both inland fisheries and aquaculture department, scientists/researchers of the research agencies/institutes and universities)
- SEAFDEC TD, Secretariat, Inland Fishery Resources Development and Management Department (IFRDMD).

### **2.4 Beneficiaries**

Direct/immediate beneficiaries are inland fishers/farmers and government officers in AMSs.

### **2.5 Commitment**

ASEAN Member States are tackling with improvement of resource management in coastal and inland fisheries in accordance with Plan of Action on Sustainable Fisheries for Food Security for the ASEAN region adapted by the ASEAN-SEAFDEC Conference

## **3. OBJECTIVE**

The monitoring method contribute to effective management of inland fishery resources by GIS mapping /RS technology in AMS countries is promoted.

The method for predicting catching condition from the environmental data by satellite on RS using GIS mapping technology is established.

## **4. INTENDED ACTIVITIES TO BE IMPLEMENTED IN THE PROJECT**

Activity 1.1: Amount of catching data by fishing ground necessary for GIS mapping analysis at project sites in ASM country are collected and compiled

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.

1.1.2: To process and compile the catch amount data from the fishing ground in target sites of AMS country, Digitization work will be done to store the collected data in the database. A certain method will be applied to remove the wrong data.

Activity 1.2: Environmental data on the geographical and inland water aquatic organisms habitats based on satellite images for each target site of AMS country are collected and compiled

1.2.1: To analyze which satellite sources can provide the suitable and reliable geographical/environmental data on the target fisheries area, and collect them, where a series of necessary index will be predefined like land surface temperature, water area, phytoplankton abundance (chlorophyll-a), rain fall, etc.

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 site of each country

Activity 1.3: The relation among geographical/environmental data based on satellites and the catch data from the fishing ground of target sites of AMS country are analyzed and clarified with multivariate analysis by GIS mapping technology

1.3.1: To analyze all the collected data in target sites of each country by various GIS mapping and analysis technologies

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 fisheries production improving

Activity 2.1: To summarize the result of catch monitoring method using GIS mapping/RS technology obtained through activity 1.

Activity 2.2: To hold the workshop on catch analysis using GIS mapping/RS technology

## **5. OUTPUTS**

- 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
- 2) Dissemination of the monitoring and analyzing GIS mapping /RS technical methods on geographical / environmental data and catch amount data in AMS

## **6. MANAGEMENT AND IMPLEMENTATION ARRANGEMENTS**

### **6.1 Management arrangement**

- 1) Southeast Asian Fisheries Development Center (SEAFDEC), Secretariat  
Coordinated by Dr. Kaoru Ishii  
Deputy Secretary General and Trust Fund Manager for the Japan Trust Fund and  
Dr. Somboon Siriraksophon, Policy and Program Coordinator
- 2) Southeast Asian Fisheries Development Center (SEAFDEC), IFRDMD,  
Coordinated by Dr. Arif Wibowo, Chief of IFRDMD

### **6.2 Implementation Arrangements**

- 1) Southeast Asian Fisheries Development Center (SEAFDEC), Secretariat  
Coordinated by Mr. Isao Koya  
Senior expert and Assistant Trust Fund Manager for the Japan Trust Fund and  
Ms. Siriporn Pangsorn, Fishing Ground Information Scientist
- 2) Southeast Asian Fisheries Development Center (SEAFDEC), IFRDMD,  
Coordinated by Dr. Arif Wibowo, Chief of IFRDMD

**IMPLEMENTATION OF CITES PROVISIONS FOR SHARKS AND RAYS  
BY SEAFDEC MEMBERS THROUGH TARGETED SUPPORT FOR DATA COLLECTION  
AND NDF TRAINING**

*Project Proposal*

The Convention on International Trade in Endangered Species of wild Fauna and Flora regulates international trade in species listed on its Appendices to ensure their survival in the wild is not threatened by such trade. As of 4 October 2017, 23 species of sharks and rays are listed on CITES Appendix II, which means commercial international trade is regulated and allowed, as long as it is legal, sustainable and traceable.

For these species, CITES thereby plays a well-targeted role at the interface between sustainable fisheries and international trade, complementing the work of national and international organizations to improve fisheries management, particularly the Food and Agriculture Organization of the United Nations (FAO) and of Regional Fisheries Management Organizations and Bodies (RFMO/RFBs), and contributing to the implementation of Sustainable Development Goal 14 to “Conserve and sustainably use the oceans, seas and marine resources for sustainable development”.

In line with the CITES Convention text, the responsibility to advise on the sustainability of an export of CITES-listed species lies with the designated Scientific Authority of the exporting country. These assessments, referred to as “non-detriment findings” (NDFs) provide assurances that exports of listed species and products thereof have not harmed wild populations or their ecosystems. There are no binding guidelines on the elements and basis of an NDF, meaning that traditional fisheries management approaches to resource assessment could be used equivalently. However, the need for primary data collection on which to base such an assessment, as well as capacity building for national authorities on applying NDF approaches, in particular in developing countries, has been recognized by the CITES Conference of the Parties.

The Southeast Asian Fisheries Development Center (SEAFDEC) is the mandated Regional Fishery Body (RFB) to develop and manage the fisheries potential of the ASEAN region. In 2015 and 2016, within the framework of the 2013-2016 EU-CITES project<sup>2</sup>, the CITES Secretariat cooperated with SEAFDEC to support species-specific data collection for sharks and rays in seven SEAFDEC member states, and organize workshops to review NDF guidelines in two of its member states.

Building on the experience and feedback from this very successful cooperation, the new project will continue to support SEAFDEC 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 that have more comprehensive data sets and information available for making strong NDFs, the project will help to establish best practice examples for the region. By supporting primary data collection where that is currently insufficient, the project will help to make sure that all Parties will eventually be able to make robust NDFs.

Proposed Activities

1. Continued assistance for collection of data for sharks and rays on species level for 3 data-poor Parties (*e.g.* Myanmar, Viet Nam, Cambodia)
  - National workshop for training the local enumerators and developing a schedule for shark landing data collection
  - Data collection by local enumerators at 2+ selected landing sites for 12 months
  - Data validation workshop in 3 countries
2. Support to 2-3 countries for developing of national NDF (*e.g.* Indonesia, Malaysia Thailand)
  - Attendance of regional or international training of trainers workshop
  - National workshop to compile information and write up NDF
3. SEAFDEC resource person participation at relevant CITES meetings

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<sup>2</sup> “Strengthening capacity in developing countries for sustainable wildlife management and enhanced implementation of CITES wildlife trade regulations, with particular focus on commercially-exploited aquatic species”

Starting/Ending dates:

January 2018 – January 2019, Activity report by April 2019.

Draft Budget:

<b>Items</b>	<b>Estimated cost</b>
1.1 National Workshop and Training in Data collection, 3 countries	21,000
1.2 Data collection cost, 12months, 3 countries	18,000
1.3 Data validation workshops	10,500
2. Support to 2-3 countries for developing national NDFs	20,000
3. Cost of SEAFDEC resource person travel (AC30, SC70 and COP18)	10,000
<b>Total</b>	<b>79,500</b>

## STATEMENT

By Dr. David Brown,  
FAO Regional Office for Asia and Pacific (FAO/RAP)

Secretary-General and Chief of the Training Department, Dr. Kom Silapajarn,  
Distinguished Delegates from SEAFDEC Member Countries,  
SEAFDEC colleagues,  
Delegates from regional organizations and arrangements and partners,

On behalf of FAO I would like to thank SEAFDEC for inviting FAO to this meeting and providing the opportunity to give a statement on areas of mutual interest and scope for future cooperation.

I would like to take this opportunity to congratulate SEAFDEC on the occasion of the 50<sup>th</sup> anniversary of its founding and the presentation to FAO of a “*certificate of recognition*”. FAO and SEAFDEC have had strong cooperation and collaboration for many years and we look forward to deepening and building this in the future.

Significant numbers of people around the world depend on the Blue Sectors of Fisheries and Aquaculture which make a significant contribution to food and nutrition security and livelihoods. Some 880 million people are dependent on them with around 200 million people relying on the value chain from harvesting to distribution and consumption. Seafood products are among the most traded commodities globally. The sectors are even more important in the Asia Pacific Region which is home to around 87 percent of those people with livelihoods that depend on them. The sectors face challenges. In recent years capture fisheries production has levelled off and more fisheries have become fully exploited or over exploited. The reasons for this are complex but include, for example, overexploitation of marine resources and marine pollution and habitat modification. The increasing pressures of human activities are being further compounded by the effects of climate change.

FAO is also pleased to hear of the strong progress being made by SEAFDEC and members on all elements of the programme of work presented.

The efforts of SEAFDEC and its partners (the governments of the USA, Sweden, and Japan) in supporting council members in addressing IUU fishing (implementing the PSMA, ACDS, vessel registries) are to be congratulated. These are important areas for regional collaborative effort in coordination, capacity building and technical support.

SEAFDEC’s cooperation in the regional development of capacity for EAFM is also to be congratulated and the roll out of country specific training is an excellent development.

FAO is pleased to see synergies with many other parts of the SEAFDEC programme. As we move to 2018, FAO envisages and hopes for very close collaboration on a number of key areas, namely:

- Regional cooperation with FAO, regional workshops and meetings is welcomed including participation in the recent APFIC RCFM and Session. FAO would like to extend an invitation to SEAFDEC to participate in the 34<sup>th</sup> RCFM and 35<sup>th</sup> Session to be hosted by the Philippines in May 2018.
- The “Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication” and implementation.
- Decent work. Labour and working conditions.
- Addressing Illegal Unreported and Unregulated (IUU) and in implementation of the FAO Port State Measures Agreement (PSMA). One regional project and national projects.

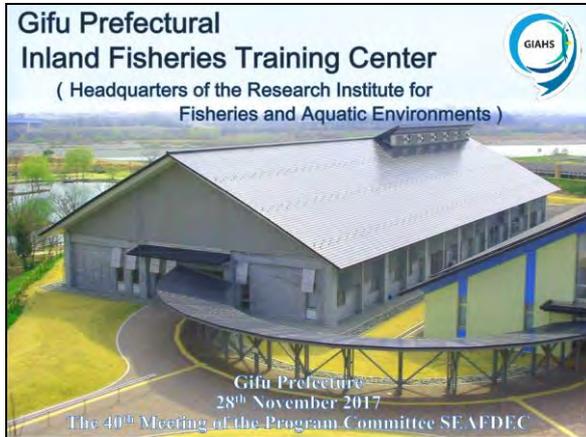
- Regional cooperation projects including the BOBLME-2 (Strategic Action Plan Implementation). The SAP has now been signed by all countries. The Indonesian Seas Large Marine Ecosystem Project (Governments of Timor Letse and Indonesia), which is now under implementation.
- Inland Fisheries (IFish) Inland fisheries biodiversity GEF project in Indonesia (Palembang) with MMAF .
- FAO's Asia Pacific Regional Initiative on Blue Growth is an important element on the sustainable development of Fisheries and Aquaculture in the region to address the projected gap in supply in the coming years.
- FAO also looks forward to continuing collaboration with SEAFDEC AQD on aquaculture related work, such as AMR and aquaculture feed and feed ingredients.
- SDG's, FAO is custodian for several SDG indicators and in the coming year we will be interested to work with SEAFDEC and its members countries in their plans to address the SDG's (and in particular SDG 14).
- The recent APFIC regional consultative workshop on Climate Change (in which SEAFDEC participated) and the fisheries and aquaculture sectors has identified a wide range of follow up actions. FAO looks forward to further collaboration with SEAFDEC and member countries in achieving their targets set by the Paris Declaration (and INDC's). FAO is now GCF accredited and is happy to work with SEAFDEC and member countries in the development of projects to address INDC priorities for the sector.
- FAO is interested to collaborate with SEAFDEC and council members and other partners on the identification of potential collaboration for the development of GEF 7 projects in the Lower Mekong Basin, Gulf of Thailand.

Mr. Secretary-General, I would like to thank SEAFDEC for the opportunity to participate as an observer in this 40<sup>th</sup> SEAFDEC PCM and thank our hosts, the Government of Thailand for their warm hospitality and for the arrangements which have been extended to FAO.

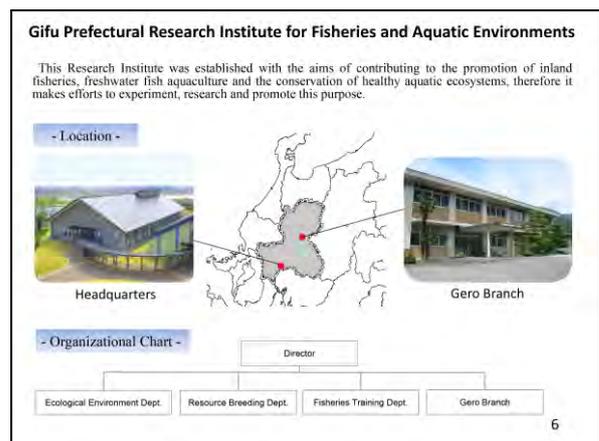
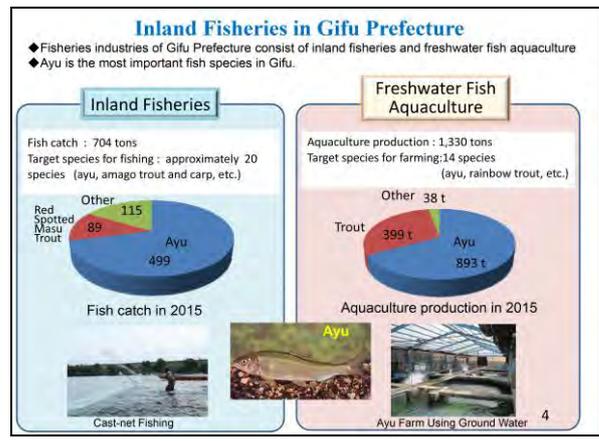
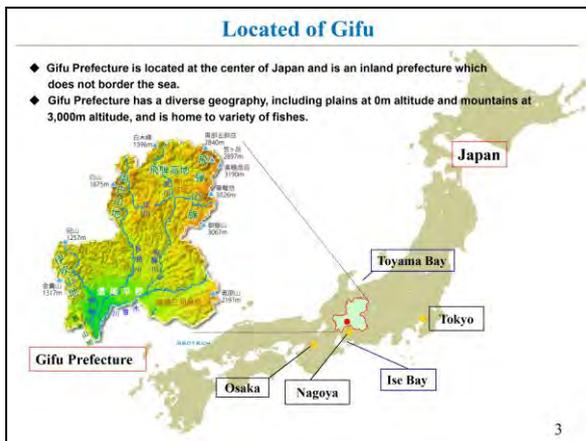
Thank you.

STATEMENT

By Mr. Yutaka Nakai,  
 Prefectural Inland Fisheries Training Center of Gifu



- ★ 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 2017
- 2



**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</li> <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> <li>➢ Environmental Conservation Initiatives in Consideration of the Links with Mountains, Rivers, and the Sea</li> <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> <li>➢ Fishery Resource Management by Fishery Cooperatives</li> <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> <li>➢ Aquaculture Technology</li> <li>• Increasing ayu, salmon and/or trout, carp, catfish, etc.</li> <li>• Production of triploid fish, Fish disease diagnosis</li> </ul>
Excursion	<ul style="list-style-type: none"> <li>➢ Facilities to support "the Nagara River System"</li> <li>• Fishery Cooperatives (ayu cargo market)</li> <li>• Production facility of ayu fry for release</li> <li>• Traditional fishing methods in Gifu Prefecture and some related facilities (comorant fishing, angling ayu by decoy, net fishing, yana fishing, etc.)</li> <li>• Old streets which remain wisdom to protect clear waters</li> <li>• World Freshwater Aquarium Aquatoto Gifu</li> <li>• ICID World irrigation facility heritage "Sodal Irrigation Channel"</li> <li>• Other aquaculture facilities</li> <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>
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>

**Business Plan in the Training Center Next Year**

**○ Trainees Acceptance System**

- Training period : One or two weeks each
- Training contents : Created after consultation with clients from our training menu
- Training costs : Gifu Prefecture bears almost all costs including daily allowance

※ However, there is a possibility that changes may occur because the above-mentioned are now under discussion with our finance section for funding to be awarded.

**○ Dispatch of Our Research Specialists**

Contents : On-site technical advice for aquaculture technology, Support for efforts toward GIAHS certification, Collaborative research




**○ Trainees Acceptance through SEAFDEC**

- Number of persons to be recruited : about Five people
- The time of recruiting : Around May, 2018
- Date of Implementation : Late August (tentative)
- Training period : One or Two weeks

**○ Training Scenes this year**



Lecture on fishery system



Practical training for DNA analysis technology



Experience Japanese traditional fishing



Catfish aquaculture farm on a field trip

## STATEMENT

*By Dr. Phattareeya Suanrattanachai,  
Mekong River Commission (MRC)*

The Mekong River Commission is an inter-governmental organization established in 1995 by the 1995 Mekong Agreement, and works directly with the governments of Cambodia, Lao PDR, Thailand and Viet Nam in their common specific interests the joint management of shared water resources and sustainable development of the Mekong River Basin with the aim of ensuring that the Mekong River Basin is developed in the most efficient manner mutually benefiting all member countries, while minimizing harmful effects on the people and the environment. The MRC serves its member countries with technical know-how and basin-wide perspectives, and plays a key role in regional decision-making and the execution of river basin policies in a way that promotes sustainable development and poverty alleviation. The MRC consists of three permanent bodies: The Council (overall governance), the Joint Committee (management board), and the Secretariat (operational arm of the MRC).

The Mekong Agreement of 1995 provides the legal mandate for the MRC and states its mission as “economically prosperous, socially just and environmentally sound development of the Mekong River Basin”. With regard to regional fisheries management, the MRC Basin Development Plan (BDP) postulates that: “A regional cooperation framework for fisheries management and development will be drafted in close collaboration and interaction with the BDP”. Key elements of the strategy are the requirements for: (i) communication and mutual understanding between actors, and (ii) Lower Mekong Basin-wide cooperation for fisheries management and development.

The MRC has received contributions from the Southeast Asian Fisheries Development Center (SEAFDEC) to strengthen institutional platforms of the Technical Advisory Body (TAB) on Fisheries for developing and implementing a regional fisheries management and development strategy, as well as planning SEAFDEC agreed to co-organize the 21<sup>st</sup> Technical Advisory Body (TAB) on Fisheries to develop draft Mekong Basin-wide Fisheries Management Strategy (BFMS) on 16-17 September 2014. Pursuant to this, MRC and SEAFDEC co-hosted regional stakeholder consultations and the 22<sup>nd</sup> TAB meeting to finalize a comprehensive draft version of the BFMS on 12-14 October 2016 in Siem Reap, Cambodia. Following these consultations, the 46<sup>th</sup> MRC Joint Committee officially endorsed the final BFMS in August 2017 in Vientiane, Lao PDR.

With the recognition that the mutual interests and benefits of MRC-SEAFDEC could be achieved through enhanced cooperation, MRC and SEAFDEC agreed to enter into a Memorandum of Understanding (MOU) on “The Promotion of Sustainable Development of Fisheries and Aquaculture in the Lower Mekong Basin and Southeast Asia” to formalize relevant collaborative efforts in fostering research and development (R&D) on inland fisheries in the countries of the Mekong River Basin that comprise the MRC-SEAFDEC partnership. To strengthen this cooperation and the agreements of both MRC and SEAFDEC Councils, the MRC-SEAFDEC MOU was signed in August 2017.

Under the signed MOU, MRC-SEAFDEC will initially begin to strengthen two relevant functions; consultancy and human resource management. Two upcoming regional consultations will be held in December 2017. The purpose of the first is to formulate a project-based action plan for the BFMS. This workshop continues the strengthening of institutional platforms of the Sub-Expert Group on Fisheries, which will replace TABs in accordance with the MRC workplan and restructuring roadmap. The expected results of this workshop are to gain both constructive and inclusive recommendations and comments for further development of the action plan, which will be the document on which fundraising from development partners or other funding sources will be based. The second will focus on the Ecosystem Approach to Fisheries Management (EAFM) for senior fisheries managers. It is expected that the senior fisheries managers will be able to provide advice on the steps needed to move forward towards EAFM.

These two initial coordination sessions will contribute to achieve the purpose of the MOU, which is to promote and coordinate the sustainable management and development of water and related resources for the countries' mutual benefits and the people's well-being; improve management mechanisms for the

sustainable development of aquatic resources; improve socio-economic well-being; and, strengthen regional programs for the sustainable use of aquatic resources, including aquatic production systems for regional food security.

## STATEMENT

*By Dr. Eduardo M. Leño,  
Network of Aquaculture Centres in Asia-Pacific (NACA)*

*Dr. Kom Silapajarn, Secretary-General of SEAFDEC,  
Distinguished Delegates,  
Representatives of International and Regional Organizations,  
Ladies and Gentlemen,*

On behalf of the Network of Aquaculture Centres in Asia-Pacific (NACA), I would like to thank SEAFDEC for inviting us to participate in this year's Program Committee Meeting.

NACA has been in existence in the region for more than 28 years of successful networking. It continues to promote rural development through sustainable aquaculture and aquatic resources management, and seeks to improve the livelihoods of rural people, reduce poverty and increase food security. The ultimate beneficiaries of NACA are the farmers and rural communities. NACA implements development assistance projects in partnership with research centres, governments, development agencies, farmer associations and other organizations. NACA works under five thematic work programmes (1) Aquatic Animal Health, 2) Sustainable Aquaculture, 3) Genetics and Biodiversity, 4) Food Safety and Certification; and 5) Response to Climate Change), and three cross-cutting programmes (1) Education and Training, 2) Gender, and 3) Information and Communication).

With Headquarters based in Bangkok, Thailand and hosted by the Thai Department of Fisheries, NACA has five Lead Centres across the region, including the SEAFDEC Aquaculture Department (AQD) in the Philippines. NACA's work programmes are also in line with the SEAFDEC/AQD's research programmes, thus several collaborations and exchanges have been made between NACA and SEAFDEC/AQD in the past several years. To strengthen the collaboration of NACA with SEAFDEC/AQD, an MoU was also signed in May 2016 for collaboration on aquaculture development in the region. Under the MoU, SEAFDEC/AQD shall be designed as a NACA Collaborating Centre. NACA and SEAFDEC/AQD will endeavor on a voluntary and non-binding basis to nominate an official contact person responsible for exchanging information with the NACA Secretariat on a periodic basis, provide technical advice to NACA member Governments and participating network centre, and co-organize scientific, meeting and workshops with NACA Secretariat.

SEAFDEC Secretariat and SEAFDEC/AQD regularly participate at NACA's annual Governing Council Meeting, wherein progress and status of project implementation, important issues in aquaculture, and current work collaborations are presented and discussed. Similarly, NACA also attends the annual Council Meeting of SEAFDEC.

The Fish Health Section (FHS) of SEAFDEC/AQD is also a member of NACA's Asia Regional Advisory Group on Aquatic Animal Health (AG), which meets annually to discuss current and related issues on aquatic animal health management in the region. NACA's involvement in some projects in the ASEAN aquaculture also sought expertise from SEAFDEC/AQD (Dr. Rolando Pakingking, Jr., former Head of FHS), which include harmonization of aquaculture certification in the ASEAN and development of "Standard Operating Procedures (SOP) for Responsible Movement of Live Aquatic Organisms in the ASEAN" (which is now an official ASEAN document). The first workshop for the pilot implementation of this SOP in the ASEAN was recently held last June 2017 in Bangkok, Thailand. The Meeting was co-organized by DOF Thailand, ASEAN Network of Aquatic Animal Health Centres (ANAAHC) and NACA.

In the past 2 years, NACA has invited SEAFDEC to participate in several important programmes in the region, covering important issues in several aspects of aquaculture under the different thematic work programmes. Some of these are listed below:

1. *Sustainable Intensification of Aquaculture in the Asia-Pacific Region* (February 2015, Bangkok, Thailand) NACA invited Dr. Felix Ayson (former Chief of SEAFDEC/AQD), and he presented a paper on “Sustainable milkfish production in marine fish cages through strong government support and effective public-private partnerships: a case study from Panabo City Mariculture Park in Davao del Norte, Philippines. This paper was included in the Proceedings published by FAO in 2016 and available for free download at <http://www.fao.org/3/a-i5362e.pdf>.
2. *Regional Consultation on Responsible Production and Use of Feed and Feed Ingredients for Sustainable Growth of Aquaculture in Asia-Pacific* (March 2017, Bangkok, Thailand) NACA invited Dr. Mar Catacutan and Dr. Roger Edward Mamauag as Fish Nutrition Experts, and they presented the following papers:
  - Development and use of alternatives to fishmeal and other high cost feed ingredients in aquaculture (Dr. Catacutan)
  - Promotion of cost-effective aquaculture feed made of locally available feed ingredients (Dr. Mamauag)
3. The 9<sup>th</sup> China International Shrimp Industry Development Forum (April 2017, Zhanjiang, China) NACA invited Dr. Nerissa Salayo (Head, Socio-Economics Section) to present “Situation and Outlook of Shrimp Production, Processing and Marketing in the Philippines and the International Trade”.
4. Strengthening Capacities Policies and National Action Plans on Prudent and Responsible Use of Antimicrobial in Fisheries (August 2017) NACA invited Dr. Rolando Pakingking, Jr. as expert.
5. Emergency Regional Consultation for Prevention and Management of Tilapia Lake Virus (TiLV) in the Asia-Pacific (September 2017, Guangzhou, China) NACA invited Dr. Rolando Pakingking, Jr. as expert and member of the Panel in the formulation of regional plan and actions towards the prevention and management of TiLV.

NACA was also invited to participate in some recent activity organized by SEAFDEC/AQD. One of these is the ASEAN Regional Technical Consultation on EMS/AHPND and Other Transboundary Diseases, wherein NACA (Dr. Eduardo Leano) and other partner organizations (OIE and FAO) provided updates on regional response, surveillance and monitoring, and global initiatives on AHPND and other transboundary diseases of cultured shrimps.

Lastly, with fruitful collaborations of NACA with SEAFDEC and other partner organizations in the region and in the world, I hope that NACA and SEAFDEC will continue to explore opportunities and implement projects towards sustainability and further development of the aquaculture industry in the region. With the expertise and resources of SEAFDEC and the networking capability of NACA, working together in the region will surely result in efficient and effective implementation of the respective work programmes. With this, I would like to express our sincere gratitude again for the continuous support of SEAFDEC in our different work programmes in the region.

Thank you very much.

## STATEMENT

*By Ms. Louise Herrman,  
Embassy of Sweden in Bangkok, Thailand*

I am very pleased to be here today at the SEAFDEC 40<sup>th</sup> Program Committee Meeting, focusing on the all effort and achievements made throughout 2017 and learn about the strategies interventions and up-coming activities for 2018, striving for a sound and sustainable management of fisheries in the ASEAN region.

2017 is not any year: its is an important year for the Oceans. It is the year when the world's leader took global to leadership and actions to save the oceans, the Ocean conference held in New York resulted in a call for action which was signed by 193 UN Member State & 1300 voluntary commitments. It is also the year when SEAFDEC celebrates 50 years since its establishment of regional cooperation on fisheries in the ASEAN region. 2017 is a milestone for commitments and actions to the Ocean.

The fantastic celebration of SEAFDEC 50's birthday took us on a journey back in time and made us all understand how SEAFDEC has been operating and hoe the important regional cooperation has developed throughout the years, focusing on research, development of more selective fishing gear, traceability systems, capacity building and policy development.

At the same time we also understand the difficult that lay on front of the organization. Since there is a growing pressure on the marine resources, due to issues such as population increase, environmental pollution and effect of climate change, leading to increased vulnerability and food insecurity of men and women living in coastal areas. Ultimately, threatening people's human rights to health, to life, to resources etc.

There are one of many reasons for why the Swedish development finds it important to strengthen regional collaboration and institutional capacity on sustainable environment, climate change adaptation and migration, protection of human rights and gender.

Sida recognizes many the promising results produced at SEAFDEC's technical departments and finds the close partnership between Sweden and SEAFDEC and partners such as FAO, USAIS, MRC, UN Environment very important.

Key achievements under the support of the Swedish Project such as the Regional Plan of Action (RPOA)- Neritic Tuna and the RPOA-Capacity, which were endorsed by ASEAN High Policy Levels.

Building upon ASEAN declarations, SEAFDEC has in cooperation with ILO increased awareness on principles for good labor practices in fisheries.

SEAFDEC has in close cooperation with FAO, Member Countries and other stakeholders successfully worked out a regional approach to the implementation of the FAO Small-Scale Fisheries Guidelines, including the principles a human rights and gender equity, which is prerequisite for sustainable fisheries. Furthermore, SEAFDEC has during the years carried out an impressive work to integrate gender at strategic and operation level.

In cooperation with the project Japanese Trust Fund, FAO, and USAID has been strengthened to implement Port State Measures and ASEAN Document Scheme (ACDS) and Traceability schemes and other measures to combat IUU fishing.

Coming back to the long and very excellent history of SEAFDEC work and that the organization now has been in operation for more than 50 years I would also like to thank all experts for the impressive results achieved both within marine fisheries, coastal aquaculture and inland fisheries. I am now looking forward to continued good collaboration and follow the development of the organization.



## STATEMENT

*By Ms. Cristina Velez Srivanasan,  
Regional Development Mission for Asia (USAID/RDMA)*

The U.S. Government would like to thank SEAFDEC and all its member countries for the opportunity to participate in this 40<sup>th</sup> Program Committee Meeting. We also would like to extend our thanks to the Government of Thailand for its hospitality and leadership in hosting this important meeting, and to the Japanese Trust Fund, Government of Sweden, FAO and the Global Environment Facility without whom this gathering would not be possible.

We have many reasons to be thankful to SEAFDEC, its member countries and our esteemed partner countries, Japan and Sweden. Thank you for your ongoing collaboration and support for the USAID Oceans and Fisheries Partnership.

We are all convinced that there is a great need to manage the fisheries of Southeast Asia. This need is urgent and it is immediate. USAID is fully committed and we believe that SEAFDEC and the actions of member countries are critical toward this end. USAID Oceans' efforts to develop traceability solutions represent key elements to reducing IUU fishing and improving fisheries management.

Over the last two years we have seen great progress. Together, we have accomplished a lot. We have advanced the development of three regional sustainable fisheries management plans for the Sulu Sulawesi Seas, the Andaman Sea, and the Gulf of Thailand, in addition to the learning sites in the Philippines and Indonesia. We have expanded the dialogue on catch documentation and traceability, including developing technical standards, identifying key data elements, and creating common definitions to facilitate information capture. We have worked to develop nationally relevant CDT solutions and have initiated their trialing. We have forged nine public-partnerships with industry and technology partners, leveraging over \$200,000 to date. This clearly demonstrates greater industry commitment to traceability and sustainable fisheries management. And we have expanded awareness and mobilized support to prioritize gender equity, and fair labor concerns as we work towards traceability solutions.

USAID recognizes and thanks SEAFDEC for its outstanding leadership. Your efforts are the reason for the project's great progress and success. It is because of your guidance, patience, and commitment that we have made the advances we've seen. As such a critical voice and actor in the fisheries sector in the region, and at such a critical time, we can only see SEAFDEC's role as gaining in importance. USAID looks forward to supporting your leadership in the years ahead.

As an extension, we also wish to recognize our partnership with the SEAFDEC member countries and our national and local counterparts. Your commitment to this forum are reflected at every level of our engagement within the countries and we have the delegates here to thank for that. Your efforts have been paramount to progress. Thank you.

The U.S. Government is working to remove illegal, unreported and unregulated fishing from supply chains. We are doing this through the new U.S. Seafood Import Monitoring Program that goes into effect in January. NOAA, with support from USAID, continues to engage many of you to build capacity to respond to this new rule. We also continue to engage on the Port State Measures Agreement.

USAID is deeply committed to this engagement. We will work with our U.S. interagency partners and bilateral missions to leverage efforts and resources to maximize impacts. We will also engage with regional partners like the CTI-CFF, RFMOs, FAO and others to synergize efforts. And most importantly, USAID will continue to seek ways to build on our relationship with SEAFDEC to promote its leadership and advance the priorities of the SEAFDEC member countries towards national and regional priorities.

Only with such a dynamic partnership with the ASEAN-SEAFDEC platform can we convene some of the best minds; capture and apply best practices; agree to implementing a CDT model that can be applied and

adapted to the varying needs across the region. We look forward to deeper engagement with each of you to further our mutual objectives.

Thank you again for the opportunity to participate in another successful Program Committee Meeting. I look forward to the discussion to follow and our collaboration over the coming years.

**RESOLUTION ON THE FUTURE OF SEAFDEC:  
VISION, MISSION, AND STRATEGIES TOWARDS 2030**

*(Adopted on 15 November 2017 at the Special Meeting of SEAFDEC Council)*

We, the Council Directors of SEAFDEC, on the occasion of the Special Meeting of the SEAFDEC Council in Bangkok, Thailand on 15 November 2017, organized in conjunction with the 50<sup>th</sup> Anniversary of SEAFDEC,

**Recognizing** that provisions in various international instruments such as the United Nations Convention on the Law of the Sea (UNCLOS, 1982), the UN Sustainable Development Goals (SDG, 2015), the FAO Code of Conduct for Responsible Fisheries (CCRF, 1995), and relevant International Plans of Action are crucial for the development of programs and activities towards enhancing the practices for sustainable fisheries development in the Southeast Asian region;

**Affirming** the need to implement actions in line with regional fisheries policy frameworks, particularly the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region adopted by the ASEAN-SEAFDEC Ministers and Senior Officials responsible for fisheries during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 “Fish for the People 2020: Adaptation to a Changing Environment” in June 2011;

**Also affirming** the need to support the Member Countries of SEAFDEC in the implementation of regional guidelines and policy recommendations developed by the SEAFDEC in collaboration with the Member Countries;

**Bearing in mind** the need to enhance cooperation with ASEAN under the ASEAN-SEAFDEC Strategic Partnership (ASSP) framework, support the implementation of activities under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) mechanism, and take into consideration the “Strategic Plan of Action on ASEAN Cooperation in Fisheries (2016-2020)”; and

**Recognizing** the need for SEAFDEC to continue playing an active role in enhancing the collaboration among the Member Countries, as well as partnerships with prominent regional, international organizations and donor agencies towards the sustainability of fisheries and aquaculture in the Southeast Asian region;

**Being aware** of the fact that regional guidelines and policy recommendations and frameworks developed under different organizations, mechanisms and arrangements beyond Southeast Asian region need to be taken into account; and

**Resolved** to adopt the Vision, Mission, and Strategies of SEAFDEC towards 2030, as follows:

**I. VISION**

*“Sustainable management and development of fisheries and aquaculture to contribute to food security, poverty alleviation and livelihood of people in the Southeast Asian region”*

**II. MISSION**

*“To promote and facilitate concerted actions among the Member Countries to ensure the sustainability of fisheries and aquaculture in Southeast Asia” through:*

- i. **Research and development** in fisheries, aquaculture, post harvest, processing, marketing of fish and fishery products, socio-economics, and the ecosystem to provide reliable scientific data and information.
- ii. **Formulation and provision of policy guidelines** based on the available scientific data and information, local knowledge, regional consultations and prevailing international measures.

- iii. **Technology transfer and capacity building** to enhance the capacity of Member Countries in the application of technologies, and implementation of fisheries policies and management tools for the sustainable utilization of fishery resources and aquaculture.
- iv. **Monitoring and evaluation** of the implementation of the regional fisheries policies and management frameworks adopted under the ASEAN-SEAFDEC collaborative mechanism, and the emerging international fisheries-related issues including their impacts on fisheries, food security and socio-economics of the region.

### III. STRATEGIES

#### 1) **Securing the sustainability of fisheries to contribute to food security, poverty alleviation and livelihood of people in the region:**

- Assessment of important marine fish stocks in the region and development of guidelines on management measures for such fish stocks;
- Assessment of the status of inland fisheries, and compilation of baseline information on policies and regulations related to inland fisheries in the Member Countries;
- Compilation of scientific data and information including local knowledge on both inland and marine fisheries to support policy formulation and management for sustainable fisheries;
- Development and promotion of regional measures and tools for combating IUU fishing;
- Development of innovative management tools and concepts that are applicable for fisheries in the region;
- Development and promotion of responsible fishing technologies, including energy optimization, carbon reduction and reduction of post-harvest losses onboard fishing vessels; and
- Integration of habitat and fisheries management, and provision of support for the conservation of important fishery resources.

#### 2) **Supporting the sustainable growth of aquaculture to complement fisheries and contribute to food security, poverty alleviation and livelihood of people in the region:**

- Development, verification and promotion of responsible and sustainable aquaculture technologies, to improve the quality of broodstocks and technologies on seed production;
- Finding alternatives to fish meal in feed formulation and promoting the economical use of feeds;
- Development of practical fish health management strategies including the establishment of early warning system for aquatic animal diseases;
- Generation of appropriate technologies for rural aquaculture to provide livelihood and alleviate poverty; and
- Compilation of scientific data and information including local knowledge to support policy on sustainable aquaculture.

#### 3) **Ensuring the food safety and quality of fish and fishery products for the Southeast Asian region:**

- Development and promotion of technology to produce high quality, healthy and safe fish and fishery products to meet the international standards;
- Improving endogenous processing technologies to standard or acceptable levels;
- Regular monitoring of chemical and biological contaminants to ensure seafood safety; and
- Promotion of seafood quality assurance systems for fish processing establishments in the region.

#### 4) **Enhancing trade and compliance of the region's fish and fishery products with market requirements:**

- Strengthening the cooperation among Member Countries to implement international standards in trade of fish and fishery products within the ASEAN region;
- Development of regional standards, policies and guidelines to enhance intra-regional/international trade; and
- Development and promotion of traceability system for fish and fishery products in the region.

**5) Addressing cross-cutting issues, such as labor, gender and climate change, where related to international fisheries**

- Provision of platforms for monitoring and evaluating the impacts of emerging international fisheries-related issues on the fisheries and economic sectors in the region;
- Organizing fora to enhance the awareness of Member Countries on international fisheries-related issues and coordinating the development of the ASEAN Common Positions to address the regional concerns on the issues;
- Monitoring of the possible impacts of and raising awareness on climate change to fisheries and aquaculture, and development of adaptation and mitigation measures in response to such impacts;
- Development of regional initiatives to promote the consideration of environmental and biodiversity conservation issues in fisheries and aquaculture management; and
- Recognition of the importance of small-scale fisheries, welfare of labor in fisheries, safety at sea, and gender equality in the fisheries and aquaculture sector.

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

- Strengthening SEAFDEC's capacity to support the ASEAN's efforts to adopt and implement regional policies and guidelines, as well as ASEAN's efforts to monitor the implementation of such regional policies and guidelines;
- Enhancing the human resource capability of the Member Countries to support, adopt and nationalize regional policies and guidelines;
- Expanding the network with prominent organizations in relevant fields and engaging actively in international fisheries fora;
- Enhancing human resources within the SEAFDEC organization and pooling expertise in the region to improve the performance of SEAFDEC; and
- Promoting SEAFDEC to wider international communities to gain more support from organizations, governments and donors.



**Annex 16**

**ALIGNMENT OF THE PROGRAMS AND ACTIVITIES OF SEAFDEC DEPARTMENTS**

1. The Alignment of the programs and activities of SEAFDEC Departments have been discussed during in the process of development for the Plans of Operation and Programs of Work of each Department which was adopted by the Council at its 46th Meeting in 2014.
2. In this connection, it is necessary to consider the Strategic Plans of Operation that linked to all SEAFDEC Departments as well as the priority issues in which required by the SEAFDEC Member Countries.
3. The priority issues are grouped into seven components as shown below:
  - Component-1: Fisheries management
  - Component-2: Fishing technologies and practices
  - Component-3: Post-harvest technology and trade-related issues
  - Component-4: Sustainable aquaculture
  - Component-5: Fisheries information and statistics
  - Component-6: Human Resource Development
  - Component-7: Inland Fisheries
4. However, at the Special Meeting of the SEAFDEC Council on 15 November 2017, the Council for Malaysia recommended that the re-alignment of programs and activities of SEAFDEC Departments should be discussed during the forthcoming Meeting of the SEAFDEC Program Committee. In response to this SEAFDEC secretariat include this agenda in the Program Committee for further consideration by the SEAFDEC Member Countries.
5. To support the discussion, secretariat provides the list of projects/activities that have been implemented by the Departments since establishments till present for consideration as shown in the *Appendix 1*.
6. The program committee is requested to provide views/comments or recommendations on the re-alignment of the activities and programs for the Departments to ensure that the activities are matched to the Departments and to create inter-Departmental collaboration.

Prog. Thrust	TD Projects/ Activities	1968-1992	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	Remarks
<b>I.</b>	<b>Developing &amp; promoting responsible fisheries for poverty alleviation and food security</b>																													
	<b>ü Research and development for best practices, and technology transfer</b>																													
	Regional training course in fishing technology	X	X	X	X																									
	Regional training course in marine engineering for fishing vessels	X	X	X	X																									
	Regional short-term training course in hydraulic machinery		X	X	X	X	X	X	X	X																				
	Study on Turtle Exclusion Devices (TEDs)																													
	Sustainable Coastal Fishing Gear and Practices		X	X	X	X	X	X	X																					
	Regional training course in responsible fishing technology (LL)						X	X	X	X																				
	Regional short-term training course in TUNA purse seine fisheries		X	X	X	X	X	X	X	X																				
	Promotion of Responsible Fishing (Reduction of By-catch, ...)						X	X	X																					
	Development and Promotion on Juvenile & Trash Exclusion Devices-JTEDs										X	X	X	X	X	X	X	X	X	X	X									
	Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
	Safety at Sea for Small Fishing boats											X	X								X	X								
	Optimizing Energy Use/Improving Safety at Onboard in Fishing Activities																					X	X	X	X	X	X	X	X	X
	Resource Enhancement Program											X	X	X	X															
	Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement																X	X	X	X	X									
	Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia																					X	X	X	X	X	X	X	X	X
	Human Resources Development (HRD) Programs on Fisheries Management Approaches for Sustainable Fisheries																					X	X	X	X	X	X	X	X	X
	<b>ü Pre and post-harvest technologies and Capacity Building</b>																													
	Improving on board fish handling technology														X	X	X	X	X	X	X	X								
<b>III.</b>	<b>Improving management concepts and approaches for sustainable fisheries</b>																													
	<b>ü Marine fisheries</b>																													
	Regionalization of the Code of Conduct for the Responsible Fisheries						X	X	X	X	X	X	X	X	X															
	Socio-economics Integration						X	X																						
	Women's role in sustainable management and development of coastal fisheries in Southeast Asia						X	X																						
	Management for Sustainable Coastal Fisheries (MSCF)						X	X	X	X	X	X																		
	Study on the Fishing Right (Bang Saphan Project)						X																							
	Toward Decentralized Management for Sustainable Fisheries									X	X	X	X	X																
	Coastal Fisheries Management (Integration of Fishing into Coastal Zone Management : Community-based Models to the Enhance Effectiveness of Management, Appropriate gears, introduction of set net)										X	X	X	X	X															
	Strengthening Small-scale Fisheries Management through the Promotion of Rights-based Fisheries and Co-management														X	X	X	X												
	Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty												X	X	X	X	X	X												
	Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management																				X	X								
	Human Resource Development for Sustainable Fisheries																				X	X	X							
	Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand																									X	X	X	X	

Prog. Thrust	TD Projects/ Activities	1968-1992	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	Remarks	
	<b>ü Combating IUU fishing</b>																														
	Improvement of information gathering system for IUU fishing related countermeasures in Southeast Asia																				X	X	X							+MFRDMD	
	Promotion of Fishing License, Boats Registration System and Port State Measures																				X	X	X								
	Promotion of Countermeasures to Reduce IUU Fishing Activities																							X	X	X	X	X	X	+SEC	
	<b>ü Inland fisheries</b>																														
	Promotion of Inland Small-scale Fisheries Management through Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Approaches																			X	X	X	X								
	<b>IV. Providing policy and advisory services for planning and executing management of fisheries</b>																														
	<b>ü Fisheries Information</b>																														
	Monograph of Fishing Gear and Methods in Southeast Asia		X	X	X	X	X	X	X	X	X	X	X																		
	Exploration of Tuna Resources and By-catch in the Eastern Indian Ocean by MVSEAFDEC		X	X	X	X	X	X	X	X	X	X	X																		
	Regional Training course on Hydroacoustic/ Stock Assessment							X	X	X	X																				
	Collaborative Research on Oceanic Squid in the Andaman Sea and South China Sea							X	X	X	X	X																			
	Fisheries Resources Survey and Operational Plan for M.V. SEAFDEC 2													X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Exploitation of Under-utilized Resources..demersal, pelagic species										X	X	X	X																	
	Deep Sea Fisheries Resources Exploration in the Southeast Asia																X	X	X	X	X										
	Information Collection of Highly Migratory Species in Southeast Asia Waters (Large Pelagic species included tunas)																X	X	X	X	X	X									
	Development of Regional Database for Fishery Management																X	X	X	X	X										
	Offshore Fisheries Resources Exploration in Southeast Asia																						X	X	X	X	X	X	X		
	Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region																						X	X	X	X	X	X	X		+SEC
	<b>ü Fisheries Issues and Initiatives in the Region</b>																														
	Collection of Information about International Support in ASEAN Region													X	X																
	<b>V. Addressing international fisheries related issues from a regional perspective</b>																														
	Regional Tuna Tagging Program in the South China Sea							X	X	X																					
	Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program																			X	X	X	X	X							



## JAPANESE TRUST FUND VII

The Government of Japan has provided SEAFDEC with the Japan 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 presented to the last Council meeting in April 2017, it is expected that a new “JTF-VII” will start in 2020, for around 5 years. As the budget request process in Japan for JTF-VII will start early next year, SEAFDEC needs to inform the Government of Japan of our consideration on JTF-VII projects before the end of this year.

SEAFDEC Secretariat and all the SEAFDEC Departments (TD, MFRD, AQD, MFRDMD and IFRDMD) have worked on our ideas and considerations on JTF7 projects through 2 meetings held in August and October 2017, and developed the draft “Framework”, and the "Project Proposal Sheets", as attached. SEAFDEC plans to submit the Framework and the Project Proposal Sheets to the Fisheries Agency Japan for their consideration, and as a reference in their domestic budget request process next year.

### JTF-VII 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]

### List of possible projects under JTF7

	Project titles	Department
	<b>Pillar 1: Establishment of good governance, including countermeasures against IUU fishing</b>	
1	Sustainable fisheries development in harmony with international fisheries related issues	SEC
2	Harmonization and enhancing utilization of fishery statistics and information	SEC
3	Promotion and regional coordination of instruments to eliminate IUU fishing in ASEAN	TD
4	Market measures for combating IUU fishing in the Southeast Asian region	MFRDMD
5	Management scheme of inland fisheries	IFRDMD
	<b>Pillar 2: Conservation and management of aquatic resources and ecosystem</b>	
6	Appropriate management of commercially-exploited aquatic species: sharks and rays	TD and MFRDMD
7	Resource enhancement for sustainable fisheries in Southeast Asia	TD
8	Sustainable utilization of fisheries resources in Southeast Asia waters	TD
9	Generation of prompt and effective strategies for aquatic animal health management	AQD
10	Attaining sustainable aquaculture through cost-effective diets and shrimp culture systems with microbiological intervention	AQD
11	Fishery management plans for two dominant pelagic species in the Southeast Asian region	MFRDMD
12	Sustainable utilization of Anguillid eel	IFRDMD
	<b>Pillar 3: Better livelihood of fisheries communities</b>	
13	Coastal and small scale fisheries management for better fishers' livelihood and fisheries resources	TD
14	Responsible technology and practice for sustainable fisheries	TD
	<b>Pillar 4: Ensuring safety and quality of fish and fishery products</b>	
15	High Pressure Processing (HPP) of fish and fishery products	MFRD
16	Good Manufacturing Practice (GMP) guidelines for the processing and handling of sashimi and sushi	MFRD

## JTF7 Project Proposal Sheet

Project title: Sustainable fisheries development in harmony with international fisheries-related issues		Responsible department: SEC
<p>Background of the project:</p> <ul style="list-style-type: none"> <li>• Development of international/regional instruments on sustainable fisheries and combating IUU fishing and lack of effective implementation of them</li> <li>• Introductions of market-related measures, including EU's IUU regulation and CITES</li> <li>• More international focus on using CITES as a tool to control fishing activities</li> <li>• Needs and requests from Member Countries to SEAFDEC to support them in dealing with those situation</li> </ul>		
<p>Difference from current JTF6 project (the "NEW" things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</p> <ul style="list-style-type: none"> <li>• Increasing/diversifying international movements in relation to fisheries management</li> <li>• New needs to more proactively take actions on international fisheries related issues, including issues related to fish trade, such as market-related measures, prevention of IUU products from supply chain, catch documentation, impacts of fishing on ecosystems, CITES and human-labor in fisheries</li> <li>• Needs to develop new regional policies, recommendations, plans of action, management measures and guidelines, in order to deal with the changing international trends/movements on fisheries related issues</li> </ul>		
<p>Objective:</p> <ul style="list-style-type: none"> <li>• Development of regional common positions, fisheries policy, guidelines, management tools and measures for ASEAN</li> <li>• Strengthening cooperation on implementation of the ASEAN-SEAFDEC Resolutions and Declaration on international fisheries-related issues</li> <li>• Strengthening ASEAN-SEAFDEC position in international fora</li> <li>• Disseminate regional interest on international fisheries-related issues</li> </ul>	<p>Final goal:</p> <ul style="list-style-type: none"> <li>• Increase a cooperation of SEAFDEC Member Country dealing with international fisheries-related issues;</li> <li>• Minimizing the impacts from international fisheries-related issues</li> </ul>	
<p>General description on the activities in the JTF7 period (2020-2024):</p> <ul style="list-style-type: none"> <li>• Meeting(s)/ workshop(s) / consultation (s) on development of regional common positions, fisheries policy, guidelines, management tools and measures for ASEAN, while providing platforms for member countries on discussion and harmonization on international fisheries related issues</li> <li>• Creation of materials for information dissemination, such as guidebooks, VDO-Youtube, Info-graphic, posters and policy papers</li> <li>• Proactive involvement into international forum, such as FAO, CITES, ASEAN forum, etc., to input good practices of ASEAN fisheries management</li> <li>• Support, capacity building and advise to member countries on development and implementation of systems and tools related to fisheries management, including electronic ASEAN Catch Documentation Scheme</li> </ul>		
<p>Possible numerical target for quantitative evaluation</p> <ul style="list-style-type: none"> <li>• Number of Brief Policy Papers on International Fisheries-related Issues, ASEAN Common Position on CITES-related issues</li> <li>• Number of regional guidelines, management tools and measures to support ASEAN Member States towards the international fisheries-related issues.</li> <li>• Number of promotional media on Regional Initiative toward international fisheries-related issues, number of interventions at International fisheries-related issues recorded the report at each forum</li> </ul>		

## JTF7 Project Proposal Sheet

Project title: Harmonization and enhancing utilization of fishery statistics and information		Responsible department: SEC
<b>Background of the project:</b> <ul style="list-style-type: none"> <li>• development of new standards by the Coordinating Working Party (CWP) on Fishery Statistics (expecting adoption in 2019), needs of ASEAN Network on Fishery Statistics to revise the Regional Framework for Fishery Statistics of Southeast Asia after adoption of new CWP standards</li> <li>• needs to improve regional fishery statistics frameworks, such as inclusion of information on fish trade and fish processing</li> <li>• needs to publish the next “Southeast Asian State of Fisheries and Aquaculture (SEASOFIA)” to enhance utilization of fishery statistics in the region</li> <li>• Need to sustain production of “Fish for the People” to disseminate information on fisheries initiatives and issues in the region</li> </ul>		
<b>Difference from current JTF6 project, necessity to implement this project in JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>• Although still focusing on statistics, but this new JTF7 project would focus on new emerging statistics standards developed at the global level as well as new fisheries/aquaculture issues important to the fisheries sector.</li> </ul>		
<b>Objective:</b> <ul style="list-style-type: none"> <li>• To harmonize the Regional Framework for Fishery Statistics for Southeast Asia with the CWP global frameworks on fishery statistics</li> <li>• To generate information on status and trends of fisheries and aquaculture of the region</li> <li>• To enhance awareness on fisheries issues and regional initiatives</li> </ul>	<b>Final goal:</b> <ul style="list-style-type: none"> <li>• Fishery statistics from the region could be compiled and exchanged with others at regional/global level</li> <li>• Information on status and trends of fisheries available through utilization of regional fishery statistics in combination with other relevant information</li> <li>• Visibility of SEAFDEC activities in response to fisheries issues</li> </ul>	
<b>General description on the activities in the JTF7 period (2020-2024):</b> <p>Objective 1:</p> <ul style="list-style-type: none"> <li>• Participation in the relevant fora in relation to development and finalization of global frameworks on fishery statistics</li> <li>• Conduct of Experts Consultation to gather inputs for revision of the Regional Framework for Fishery Statistics for Southeast Asia</li> <li>• Conduct of RTC to finalize the Revised version of Regional Framework for Fishery Statistics for Southeast Asia</li> <li>• Production and dissemination of Revised version of Regional Framework for Fishery Statistics for Southeast Asia</li> </ul> <p>Objective 2:</p> <ul style="list-style-type: none"> <li>• Conduct of consultation among SEAFDEC Departments to develop outline and identify contributors</li> <li>• Development of input articles and conduct of consultation to finalize the articles</li> <li>• Production and dissemination of publication on Southeast Asian State of Fisheries and Aquaculture in 2022</li> </ul> <p>Objective 3:</p> <ul style="list-style-type: none"> <li>• Production and dissemination of publication on “Fish for the People” (3 issues a year)</li> </ul>		
<b>Possible numerical target for quantitative evaluation</b> <ul style="list-style-type: none"> <li>• Number of standards that has been harmonized with those at the global level</li> <li>• Number of topics on fisheries and aquaculture that indicate status and trends of fisheries and aquaculture published in SEASOFIA</li> <li>• Number of articles on regional issues/initiatives published in “Fish for the People”</li> </ul>		

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## JTF7 Project Proposal Sheet

Project title: Promotion and regional coordination of instruments to eliminate IUU fishing in ASEAN		Responsible department: TD
<p>Background of the project:</p> <ul style="list-style-type: none"> <li>• Degeneration of fisheries resources and situation of IUU fishing in the region</li> <li>• Following the directions of Resolutions and Plans of Action on IUU fishing</li> <li>• Needs and requests from Member Countries to SEAFDEC for supports to combat IUU fishing, including implementation of relevant instruments</li> </ul>		
<p>Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</p> <ul style="list-style-type: none"> <li>• New establishment of RFVR Database for smaller vessels that facilitates combating IUU fishing in the region</li> <li>• Strengthen implementation of new regional/international instruments by Member Countries</li> <li>• More technical supports for Member Countries on development of new domestic regulations to combat IUU fishing</li> <li>• More and closer cooperation and coordination with other international organizations such as FAO to support Member Countries’ activities to combat IUU fishing</li> </ul>		
<p>Objective:</p> <ul style="list-style-type: none"> <li>• Establishment of effective instruments to combat IUU in the region</li> <li>• Encouragement and promotion on utilization of instruments to combat IUU fishing</li> <li>• More coordination among SEAFDEC members and other international organization on the issue of combating IUU fishing</li> </ul>	<p>Final goal:</p> <ul style="list-style-type: none"> <li>• Coordination among SEAFDEC Member to combat IUU fishing</li> <li>• Elimination of IUU fishing in the region</li> </ul>	
<p>General description on the activities in the JTF7 period (2020-2024):</p> <ul style="list-style-type: none"> <li>• Meeting(s)/ workshop(s) / consultation (s) on establishment and development of instrument (such as RFVR Database in other appropriate length of fishing vessel for useful in the region) will be held and participated by SEAFDEC Member Countries.</li> <li>• On-site training on encouragement and promotion to utilize relevant instruments will be conducted in Member Countries. Relevant government agencies officers are expected to participate in this activity. Moreover, on-site training on capacity building to support PSM implementation might be conducted as requirement from SEAFDEC Member Countries.</li> <li>• Survey and technical support on development of instruments to combat IUU fishing based on requests from member Countries</li> <li>• Information material and package to combat IUU fishing will be produced and distributed to Member Countries and public.</li> </ul>		
<p>Possible numerical target for quantitative evaluation</p> <ul style="list-style-type: none"> <li>• Coverage of RFVR (how much % of all the fishing vessels in the region is covered by RFVR)</li> <li>• Number of access to RFVR database</li> <li>• Number of Member Countries that are able to implement relevant instruments within supports from SEAFDEC</li> </ul>		

## JTF7 Project Proposal Sheet

Project title: Market measures for combating IUU fishing in the Southeast Asian region		Responsible department: MFRDMD
Background of the project: <ul style="list-style-type: none"> <li>Every country in the Southeast Asian region and regional efforts are now focusing on the promotion of sustainable fisheries management and countermeasures to IUU fishing</li> <li>Application of market-related measures can be effectively implemented to combat IUU fishing</li> <li>The country experience in the region in the implementation activities to combat IUU fishing should be shared and learned to strengthen the regional effort and networking</li> </ul>		
Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024): <ul style="list-style-type: none"> <li>The JTF 6 project concentrated on market measures to combat IUU fishing which include establishment and implementation of the guidelines to prevent entry of IUU fish and fishery product from being marketed</li> <li>The proposed project under JTF 7 will look into utilization of other market measures to combat IUU fishing excluding ACDS and the ASEAN Guidelines which was already covered by JTF 6 project</li> <li>Non-IUU labelling of fish and fishery products is an example of a market measures that could strengthen local activities to combat IUU fishing in AMSs</li> <li>The project activities under the ACDS are meant for fish and fishery products for the export market</li> </ul>		
Objectives: <ul style="list-style-type: none"> <li>To study market measures for strengthening efforts to combat IUU fishing in the region</li> <li>To develop and implement a non-IUU labelling for fish and fishery products in ASEAN Member States</li> <li>To assist ASEAN Member States in application and implementation of related market measures for combating IUU fishing</li> </ul>	Final goal: Development of market measures for combating IUU fishing	
General description on the activities in the JTF7 period (2020-2024): <ul style="list-style-type: none"> <li>Regional Technical Consultation for development and implementation of regional non-IUU labelling</li> <li>Regional Workshops for study the market measures for strengthening efforts to combat IUU fishing in the region</li> <li>Internal Meetings for analysis the feedback from study of the market measures for strengthening efforts to combat IUU fishing in the region</li> <li>Consultation with Member Countries</li> <li>Preparation and publishing of terminal report during final half year</li> </ul>		
Possible numerical target for quantitative evaluation: <ul style="list-style-type: none"> <li>Number of new technique / method introduced in relation to regional non-IUU labelling and market measures</li> <li>Number of scientific / technical paper on regional non-IUU labelling and market measures</li> </ul>		

## JTF7 Project Proposal Sheet

Project title: Management scheme of inland fisheries	Responsible department: IFRDMD
Background of the project: <ul style="list-style-type: none"> <li>• Remaining needs for supports on inland fisheries management measures and habitat conservation measures</li> <li>• Needs to analyze data/information obtained in JTF6 on inland capture fisheries in the region, in order to identify inland fisheries conservation and management measures that fit the characteristics of the region, such as fish passage</li> </ul>	
Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024): <ul style="list-style-type: none"> <li>• New activities to promote ecosystem resilience and enhancing ecosystem connectivity as a means of conserving biodiversity and habitat</li> <li>• Conservation of the ecosystem services identified in JTF6, including fish reserve harvest strategies and optimizing catch while protecting fish stock</li> <li>• Study for aquatic animals connectivity in order to identify appropriate management measures for species with long migration routes</li> <li>• Follow-up activities, including new publications, for concrete actions on specific issues in specific sites and inland fisheries management based on information and knowledge obtained in JTF6</li> <li>• Support member countries to improve capacity in collecting fisheries statistics</li> </ul>	
Objective: <ul style="list-style-type: none"> <li>• Facilitate better understanding and knowledge on status and condition of inland fisheries at national and local level</li> <li>• More coordinating among SEAFDEC members on the issue of compilation of fisheries and socio-economic information on inland fisheries in the Southeast Asia</li> <li>• Supporting member countries to improve capacity in collecting fisheries statistics regarding catch and effort data</li> <li>• Introduction and identification of conservation and management measures that fit the characteristics of the region</li> </ul>	Final goal: Better fisheries management in the region through improvement of data and information collection methodology, acknowledge on the concept and theoretical framework of Fisheries Management in Southeast Asia
General description on the activities in the JTF7 period (2020-2024): <ul style="list-style-type: none"> <li>• Meetings/ trainings / workshops / surveys on research and development</li> <li>• Monitoring in target countries</li> <li>• Government officials/ fishers/ fishing companies/ fisheries organizations/ Academics / Scientists are expected to participate in this activity</li> </ul>	
Possible numerical target for quantitative evaluation <ul style="list-style-type: none"> <li>• Monitoring the trend/fluctuation of catch and effort data of fish resources</li> <li>• New techniques/measures/methods introduced/identified that fit the characteristics of inland fisheries in the region</li> </ul>	

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## JTF7 Project Proposal Sheet

Project title: Appropriate management of commercially-exploited aquatic species: sharks and rays		Responsible department: TD and MFRDMD
<b>Background of the project:</b> <ul style="list-style-type: none"> <li>Increasing international pressure in relation to CITES on sharks and rays, some of which are common and economically important for local fishers</li> <li>Importance of Non-Detrimental-Finding studies including socio-economic, marketing and trade for promotion of export of CITES listed species</li> <li>Needs for more information, including landing status by species for sharks and rays, population dynamics, and capacity building in making valid identification</li> </ul>		
<b>Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>Utilization of data collected under JTF6 project especially for stock assessment and socio-economy</li> <li>Technical support to Member Countries on the formulation of appropriate fisheries sharks and rays management and conservation approaches, e.g. NPOA</li> <li>More focus on impacts of CITES listed species to livelihood of fishers and supporting SEAFDEC MCs to produce NDF</li> <li>Further training and studies on age determination, taxonomy and stock structure using genetic analysis and species identification</li> <li>More collaboration with International Organizations, including FAO, IOTC, WCPFC and CITES, to improve shark and ray management</li> </ul>		
<b>Objective:</b> <ul style="list-style-type: none"> <li>To improve sharks and rays data utilization and collection for management of sharks and rays</li> <li>To provide better management plan on sharks and rays in the SEAFDEC MCs</li> <li>To study on stock structure using genetic analysis, age and growth and develop fishery stock assessment models for sharks and rays in Southeast Asia</li> <li>To establish appropriate mechanism strategies to handle CITES issues, including NDF</li> </ul>	<b>Final goal:</b> Sustainable utilization of sharks and rays resources based on essential scientific and socio-economic information in Southeast Asia	
<b>General description on the activities in the JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>Through technical supports and training, identification of national management approach on sharks and rays, statistical data collection, species identifications, status of utilization of sharks and rays both domestically and internationally, development of NDF through socio-economic studies</li> <li>Biological studies such as stock structure using genetic analysis, age and growth to develop fishery stock assessment models for sharks and rays in Southeast Asia</li> <li>Through meetings and studies, improve indicators on sharks and rays sustainability, base on ecological, socio-economic and management aspects</li> <li>Collaboration with International/regional organizations on sharks and rays management and conservation plan including CITES listed species and proposed to be listed</li> </ul>		
<b>Possible numerical target for quantitative evaluation:</b> <ul style="list-style-type: none"> <li>Number of new management approaches that contribute to sustainable utilization of sharks and rays</li> <li>Number of new drafted NPOA –Shark produced by Member Countries</li> <li>Number of enumerators that have enough capacity in collecting appropriate landing data and other related information</li> <li>Number of NDFs document established in Member Countries</li> <li>Number of scientific papers, books and articles on issues such as age and growth, taxonomy, genetic and socio-economic analysis</li> </ul>		

## JTF7 Project Proposal Sheet

<b>Project title:</b> Resource enhancement for sustainable fisheries in Southeast Asia	<b>Responsible department:</b> TD
<b>Background of the project:</b> <ul style="list-style-type: none"> <li>• Strongly needs to monitor and improve fisheries habitat and critical fishing ground in coastal and offshore area</li> <li>• Apply knowledge on oceanography, fisheries biology, socioeconomic and marine engineering to formulate the appropriate habitat management</li> <li>• Recommendation of the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 on the optimization of the use of inshore waters through resources enhancement programs and relevant human resource development</li> </ul>	
<b>Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>• In JTF6, SEAFDEC promotes resource enhancement mainly in critical habitats/fishing grounds. In JTF7, this project will put more focus on monitoring and management of the habitats and fishing grounds handled in JTF6</li> <li>• Further, in JTF7, knowledge and experience obtained through JTF6 projects will be applied to broader areas, including expansion to the offshore areas, based on the needs and priorities of member countries.</li> <li>• Integrate knowledge in fisheries, e.g. oceanography, fisheries biology, socioeconomic and habitat management, to support fisheries resource enhancement</li> <li>• More collaboration with SEAFDEC Departments i.e. MFRDMD, AQD and IFRDMD on the project implementation</li> </ul>	
<b>Objective: Support members through</b> <ul style="list-style-type: none"> <li>• Research and Development Program (R&amp;D) to support member countries to monitor, evaluate and improve fisheries habitat and critical fishing ground as well as evaluate the impact of Resources Enhancement Devices in habitat improvement.</li> <li>• Support SEAFDEC MCs to investigate appropriate habitat management</li> <li>• Human resource development and dissemination/exchange knowledge and experience on the fisheries resources enhancement techniques and measures in the region</li> </ul>	<b>Final goal:</b> <b>Sustainable Fisheries Habitat in Southeast Asia through appropriate resource enhancement techniques and measures in Southeast Asia.</b>
<b>General description on the activities in the JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>• Identification of threats, issues, and develop set activities on resource enhancement base on the Regional Symposium in 2015 and Technical/expert meetings to evaluate the present situation of fisheries habitat in the region.</li> <li>• Research study on fisheries resources enhancement techniques and relevant fields e.g. oceanography, fisheries biology, socioeconomic and marine engineering to solve the threats and Issues in pilot sites.</li> <li>• Linking with the relevant JTF 7 projects e.g. HRD, Small-scale Management and Technology for Sustainable Fisheries and More collaboration with SEAFDEC Departments i.e. MFRDMD, AQD and IFRDMD to solve the threats and Issues in pilot sites</li> <li>• Dissemination of basic knowledge, relevant information and lessons learned from projects and pilot sites, in order to contribute to develop human resources to the Member Countries</li> </ul>	
<b>Possible numerical target for quantitative evaluation:</b> <ul style="list-style-type: none"> <li style="width: 50%;">• Regional and national issues on enhancement techniques and measures to improve fisheries habitat and resources</li> <li style="width: 50%;">• Number of pilot site to monitor and improve fisheries habitat and critical fishing ground</li> <li style="width: 50%;">• Number of recommended rules/management measures introduced to the site to protect the habitat</li> <li style="width: 50%;">• Number of the human resource development program and fisheries officer</li> <li style="width: 50%;">• Data statistic scheme which annually publishes the catch data has been formulated</li> <li style="width: 50%;">• Amount of the target fisheries resources' release in the conservation area has increased</li> </ul>	

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## JTF7 Project Proposal Sheet

Project title: Sustainable utilization of fisheries resources in Southeast Asia waters		Responsible department: TD
<b>Background of the project:</b> <ul style="list-style-type: none"> <li>Needs to investigate, deteriorated and under-utilized fisheries resources and promote their utilization in a precautionary manner, based on the best available scientific and fisheries economic information, in the offshore areas in the EEZs of members</li> <li>Needs to more positively, creatively and strongly collaborate with RFMOs on tuna and tuna like species resource assessment and management</li> </ul>		
<b>Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>In JTF6, project focused on offshore fisheries resources in the region</li> <li>In JTF 7, project will study on fisheries economic of commercial fisheries and their appropriate fisheries management</li> <li>In JTF7, this project aims to investigate potential of under-utilized fisheries resources and promote their utilization in in Southeast Asia Waters and -collaboration with relevant RFMOs for the promotion on the sustainable fisheries resources utilization in High-sea</li> </ul>		
<b>Objective:</b> <ul style="list-style-type: none"> <li>Support members on data collection through actual survey, analyze potential fisheries resources for commercial use in coastal and offshore</li> <li>Conduct collaborative research survey by utilization of M.V. SEAFDEC2 and support researchers of SEAFDEC Member Countries to participate resources research survey vessels</li> <li>Research and Development (R&amp;D) on suitable sampling technology for marine fisheries resources survey , stock assessment model(s), fishing ground and marine environment, and fisheries economic for sustainable development and management of the fisheries resources in offshore</li> </ul>	<b>Final goal:</b> Sustainable fisheries resources in Southeast Asia by resources assessment, improve data collection and identification of the fishing pressure in Southeast Asia Waters	
<b>General description on the activities in the JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>Technical meetings on the status of fisheries resources in offshore, to identify threats and issues on sustainable offshore fisheries resources, to explore under-utilized resources in offshore, for both demersal and pelagic resources</li> <li>R&amp;D on suitable sampling technology for marine fisheries resources survey , instruments and techniques (e.g. mid-water trawls and hydro acoustic survey for small pelagic species), including through utilization of M.V. SEAFDEC2 and/or other research vessels. Methodology on identification of indicator on the abundance of fisheries resources, fishing ground and marine environment, and commercial fisheries economic</li> <li>Identification on fisheries resources and fishing grounds through GIS and remote sensing techniques in collaboration with relevant agencies and institutes</li> </ul>		
<b>Possible numerical target for quantitative evaluation:</b> <ul style="list-style-type: none"> <li>Number of deplete condition, under-utilization fisheries resources and potential management actions identified by Member Countries</li> <li>Number of research study on the fisheries resources, fishing ground and marine environment and fisheries economic</li> <li>Number of collaborations between SEAFDEC Department, Member Countries and relevant RFMOs</li> <li>New techniques, methods and fishing/sampling gears sampling technology , instruments and techniques developed through R&amp;D</li> </ul>		

## JTF7 Project Proposal Sheet

Project title: Generation of prompt and effective strategies for aquatic animal health management		Responsible department: AQD
<p>Background of the project:</p> <ul style="list-style-type: none"> <li>Emergence and spread of serious pathogens in aquaculture is one of the main problems in aquaculture. Intensive aquaculture practices tend to provide a platform for the emergence of pathogens, while global trade in aquatic animals and their products offer avenues for trans-boundary spread of pathogens. The risk of pathogen transfer is generally considered greater for movement of live aquatic animals than for movement of dead product. Regardless of the disease risks involved, aquaculture and global trade will continue to intensify and expand</li> <li>Aquatic animal diseases are a major risk and a primary constraint to the growth of the aquaculture sector in many countries in the Asia-Pacific region. The occurrence of diseases resulting from the trans-boundary spread of pathogens has remained as a major impediment in the sustainability of the aquaculture industry. Generation of prompt and effective strategies for aquatic animal health management, build capacity and awareness on diagnosis and implement simple and practical surveillance program should be addressed</li> </ul>		
<p>Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</p> <p>TF 6 focused on the establishment of diagnostic methodologies and effective dissemination of useful information such as precaution of potential diseases outbreak and recommendation of appropriate fish health management to local government unit officers, farmers and traders. In TF7, the focus will be on the application and verification of the established diagnostic protocols in prevention, control and management from TF6</p>		
<p>Objective:</p> <ul style="list-style-type: none"> <li>Update the status of emerging and economically important aquatic animal diseases</li> <li>Development of different strategies on the application of the established preventive measures against emerging and economically important aquatic animal diseases</li> </ul>	<p>Final goal:</p> <p>Generation of prompt and effective strategies for aquatic animal health management, build capacity and awareness on diagnosis and implement simple and practical surveillance program will be addressed</p>	
<p>General description on the activities in the JTF7 period (2020-2024):</p> <ul style="list-style-type: none"> <li>Surveillance of the emerging and economically important aquatic animal diseases</li> <li>Evaluation of the preventive measures against emerging and economically important aquatic animal diseases developed from TF6</li> <li>Formulation of an effective strategy on the application of these preventive measures against emerging and economically important aquatic animal diseases</li> <li>Capacity building and awareness on preventive measures</li> </ul>		
<p>Possible numerical target for quantitative evaluation</p> <ul style="list-style-type: none"> <li>Decrease the disease outbreak caused by emerging and economically important aquatic animal diseases</li> <li>Increase the production of economically important aquaculture commodities</li> <li>Lessen the production cost by farm owners due to the decrease in disease outbreak</li> <li>Number of on-site training in member countries, farmers and government officers per country per year</li> </ul>		

## JTF7 Project Proposal Sheet

<b>Project title:</b> Attaining sustainable aquaculture through cost-effective diets and shrimp culture systems with microbiological intervention	<b>Responsible department:</b> AQD
<b>Background of the project:</b> <ul style="list-style-type: none"> <li>Wild catch of selected indigenous species in SEA declined. Enhancement will increase catch to directly address nutritional requirement of subsistence fisherfolks in the region</li> <li>Reduction of fish meal dependency in aquaculture feed should be realized and comprehensively addressed by 2030. There is an immediate need for the development of a Southeast Asian regional database of alternative ingredients that will be shared among member countries to benefit the stakeholders</li> <li>To obtain a safety and traceable food, a new shrimp culture system without the use of harmful chemicals and antibiotics should be undertaken</li> <li>There is a necessity for the conduct of a training course in sustainable aquaculture, to include fish nutrition and feed development that is designed specific for a member country in the Southeast Asian region that will bring about regionalization</li> </ul>	
<b>Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</b> The developed technologies under JTF6 will be verified in the field under JTF7. <ul style="list-style-type: none"> <li>The focus of enhancement under TF7 is to rebuild stocks of indigenous fish species for domestic consumption of subsistence fishing families in SEA vs. the case of high-value export species under TF6</li> <li>An intensive research on alternative nutrient ingredient has been conducted under JTF6 and its effectivity will be tested for small scale aquaculture in JTF7. The creation of a regional database of alternative ingredient is novel and will allow member countries to share information that will benefit a sustainable feed aquaculture.</li> <li>Under TF6, diagnostic method was developed against shrimp pathogen. Under TF7, the demonstration of a refined shrimp culture system to mitigate the detrimental effects of disease should be developed and verified in the field among member countries.</li> <li>In JTF6, a high evaluation was received from sustainable aquaculture trainees and a new component on aquaculture nutrition will be included under JTF7</li> </ul>	
<b>Objective:</b> <ul style="list-style-type: none"> <li>To develop mass seed production techniques; re-populate broodstocks; and re-build fisheries through regulated harvest</li> <li>To identify, characterize, process and field test alternative nutrient ingredients</li> <li>To develop and introduce shrimp culture systems in the region with microbial interventions and absence of harmful chemicals</li> <li>To disseminate the technology to SEA thorough training courses</li> </ul>	<b>Final goal:</b> <ul style="list-style-type: none"> <li>Sustainable fish stocks for nutritional and livelihood needs of subsistence fisherfolks in SEA</li> <li>Reduction of fish meal utilization in aquaculture feeds</li> <li>Increase shrimp production safe for human consumption</li> <li>Enable farmers in the region to acquire technology skills on sustainable aquaculture</li> </ul>
<b>General description on the activities in the JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>Implement mass seed production, releases and adopt participatory strategies to restore fishery stocks</li> <li>Identification, characterization, processing of feed ingredients to be evaluated for fish species common in the region</li> <li>Evaluation of shrimp culture systems developed under JTF7 in several member countries</li> <li>Conduct training courses on fish nutrition, seed production, biodiversity conservation, stock enhancement and habitat rehabilitation in SEA</li> </ul>	
<b>Possible numerical target for quantitative evaluation:</b> <ul style="list-style-type: none"> <li>Number of capacitate and involve fisherfolks and government fishery stakeholders in seed mass production for aquaculture-based enhancement in selected fisheries; and improve human nutrition and income of households in selected in SEA</li> <li>An increase of processed alternative ingredients will be tested to fish species common in the region</li> <li>Reduction of fish meal use in diet formulation</li> <li>Increase in shrimp production</li> <li>Farmers from SEA will be undertaking a training course on sustainable aquaculture. Number of fish farmers or government officers per year who participate in the program</li> </ul>	

## JTF7 Project Proposal Sheet

Project title: Fishery management plans for two dominant pelagic species in the Southeast Asian region		Responsible department: MFRDMD
<p>Background of the project:</p> <ul style="list-style-type: none"> <li>There are little information of Age-Length-Key for common small pelagic fish in the region, which needs to develop age structured model</li> <li>The effective management for shared stocks requires a regional management measure to be taken for the whole SEA region</li> <li>The appreciable management for multispecies was recommended during JTF6</li> <li>Little information on stock status for targeted species hinders an effective management</li> </ul>		
<p>Difference from current JTF6 project (the "NEW" things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</p> <ul style="list-style-type: none"> <li>As a new activity in JTF7, age determination methods for 2 common pelagic species will be established</li> <li>This project will focus on development of Fishery Management plan (FMP) for 2 common species level, based on the results of JTF6 project</li> <li>the structures for 2 common species will be investigated. Our knowledge and experience on <i>A. sirm</i> obtained through the implementation of JTF6 project will be a significant contribution to this activity</li> </ul>		
<p>Objectives:</p> <ul style="list-style-type: none"> <li>To develop ageing method using hard parts such as otoliths for 2 selected species</li> <li>To standardize effort/CPUE indices for 2 selected species</li> <li>To develop stock and risk assessment methods for 2 selected species</li> <li>To clarify the genetic structures for 2 selected species</li> <li>To develop draft of FMPs for 2 selected species</li> </ul>	<p>Final goal:</p> <p>Establishment of appropriate management for the 2 species in the region</p>	
<p>General description on the activities in the JTF7 period (2020-2024):</p> <ul style="list-style-type: none"> <li>Regional Core Expert Meetings for stock and risk assessments, genetic analysis and development of drafts FMPs</li> <li>Regional Workshops for stock and risk assessments, genetic analysis and development of drafts FMPs</li> <li>Internal Meetings for mainly development of FMPs and age determination method using hard parts of body such as otoliths</li> <li>Genetic sample collection and analysis for 3 years and a half</li> <li>Preparation and publication of terminal report for final 1 year and half</li> </ul>		
<p>Possible numerical target for quantitative evaluation:</p> <ul style="list-style-type: none"> <li>Establishment of, and number of scientific paper on, age determination</li> <li>Number of techniques/methods on stock, risk assessments and genetic analysis that is applicable to the region</li> <li>Number of International Scientific papers on stock, risk assessments and genetic analysis</li> <li>Number of FMPs established</li> </ul>		

## JTF7 Project Proposal Sheet

Project title: Sustainable utilization of Anguillid eel		Responsible department: IFRDMD
<b>Background of the project:</b> <ul style="list-style-type: none"> <li>Needs for long-term maintenance on data gathering on (glass) eel fishery and eel farming.</li> <li>Needs to expand the pilot data gathering systems to other sites for better coverage on major fishing sites.</li> <li>Needs for technical supports from SEAFDEC in member countries in developing fishery management measures on eel, especially on monitoring the trend/fluctuation of resources</li> <li>Needs scientific baseline data and information for conservation and management of the transboundary anguillid eel</li> <li>Needs for traceability measures, such as stop illegal export, supporting legal export through such as “product certification” and “ecolabelling”</li> <li>Needs conservation to establish healthy and proper recruitment habitats</li> </ul>		
<b>Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>In JTF7, more focus will be put on data gathering on glass eel fishery, species composition and distribution, study on migration pattern of <i>Anguilla</i> sp., technical transfer of eel stock evaluation methods and measures for regulating eel fisheries and conservation of the eel resources</li> <li>Consideration for new measures such as certification/ecolabelling/traceability, as a part of management measures</li> <li>Establishment of closer collaboration among DoFs, local governments, eel fishers/eel farmers/companies and SEAFDEC</li> </ul>		
<b>Objective:</b> <ul style="list-style-type: none"> <li>Data gathering on glass eel fishery</li> <li>Technical transfer of eel stock evaluation methods</li> <li>Consideration of the concrete measures for regulating the eel fisheries and conservation of the eel resources</li> <li>For supporting the legal trade through certification/ecolabelling/traceability, including eACDS</li> </ul>	<b>Final goal:</b> Better eel fisheries management in the region through monitoring the trend/fluctuation of resources and taking measures for conservation.	
<b>General description on the activities in the JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>Meetings/ trainings / workshops / surveys on research and development</li> <li>Monitoring in target countries</li> <li>Government officials/ fishers/ fishing companies/ fisheries organizations/ academics / scientists are expected to participate in this activity</li> </ul>		
<b>Possible numerical target for quantitative evaluation</b> <ul style="list-style-type: none"> <li>Monitoring the trend/fluctuation of catch data/ fish resources</li> <li>Increase in availability of data on eel catch</li> <li>Number of conservation measures/areas established</li> </ul>		

## JTF7 Project Proposal Sheet

<b>Project title:</b> Coastal and small scale fisheries management for better fishers' livelihood and fisheries resources	<b>Responsible department:</b> TD
<p><b>Background of the project:</b></p> <ul style="list-style-type: none"> <li>• Decline of fisheries resources, degradation of coastal habitat and poverty remain as serious issues to the livelihood of coastal and small-scale fishers and communities</li> <li>• Need to solve various issues through capacity building on appropriate fisheries management and to strengthen human well-being in coastal and small scale fishers and communities</li> <li>• Need to integrate knowledge and experience from previous projects on Human Resource Development (HRD) and Community-based Resources Management/Co-management (CBRM)</li> <li>• ASEAN-SEAFDEC Resolution and Plan of Action, especially the Plan of Action B11-B13, on co-management, strengthening of the capacity and participation of stakeholders</li> </ul>	
<p><b>Difference from current JTF6 project (the "NEW" things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</b></p> <ul style="list-style-type: none"> <li>• Current projects on HDR and CBRM both include selection and establishment of project learning sites. In JTF7, these 2 projects will be integrated so that such selection and establishment of project learning sites will become smoother and more efficient, and knowledge and experience in current HRD and CBRM projects will be integrated</li> <li>• JTF7 project will start by selection and establishment of project learning sites and by identifying core stakeholders. Researches on socioeconomic issues, resource utilization and local governance will be conducted in order to find baseline information. Each learning site will be tailored based on topographical and sociological approach through the most appropriate technologies/methods for better fishers' livelihood and sustainable fisheries resources</li> <li>• More coordination with IFRDMD and MFRDMD on the result of project, knowledge experience and lessons learnt</li> </ul>	
<p><b>Objective:</b></p> <ul style="list-style-type: none"> <li>• Introducing the management approach(s) to enhance sustainable development of coastal and small scale fisheries to SEAFDEC MCs through the project implementation at the learning sites</li> <li>• Build up/strengthen human resource of the member countries through project implementation at the learning sites</li> <li>• Each learning site/country success in better fishers' livelihood, fisheries resources, and coastal fisheries management through the involvement of fisheries stakeholders and community</li> </ul>	<p><b>Final goal:</b> Appropriate approach to enhance sustainable coastal and small-scale fisheries of Southeast Asia through the establishment and involvement of core team/group and stakeholder, HRD programs, and the managing of fisheries resources</p>
<p><b>General description on the activities in the JTF7 period (2020-2024):</b></p> <ul style="list-style-type: none"> <li>• Consolidate the lesson learnt from the JTF 6 Project of HRD and CBRM</li> <li>• Identify pilot sites and implement project activities in the sites by identifying and prioritizing issues and developing project activities to enhance fisheries resources and increase income</li> <li>• Information collection to report base line data on socioeconomic, fisheries resource and the utilization of the pilot site(s) produced in collaborations with stakeholder and local fisheries officer (on the job training to stakeholders and local fisheries officers)</li> <li>• Establishment of sub-project activities on country's core group and stakeholder in pilot site for better fishers' livelihood through sustainable fisheries development</li> <li>• Regional training courses on HRD for better fishers' livelihood through sustainable fisheries development, participants will learn to develop the sustainable fisheries management plan and methods to achieve better fishers' livelihood</li> <li>• Coordinate and sharing with IFRDMD and MFRDMD on the result of project, knowledge experience and lesson learnt</li> </ul>	
<p><b>Possible numerical target for quantitative evaluation</b></p> <ul style="list-style-type: none"> <li>• Number of learning site(s) agree</li> <li>• Recommendation on the coastal and small-scale fisheries management approaches agreed by stakeholder or community in learning sites.</li> <li>• Base line and final report on socioeconomic of the Pilot site produced in collaborations with local fisheries officer</li> <li>• Number of core groups of the fisheries officer who methodology to train fishers in the country</li> <li>• Number of key stakeholders who train and know how to improve their income through sustainable fisheries development</li> <li>• Achieve with selected indicator(s) e.g. income of fishers, catch rate, and etc, at the pilot sites</li> </ul>	

## JTF7 Project Proposal Sheet

Project title: Responsible technology and practice for sustainable fisheries		Responsible department: TD
<b>Background of the project:</b> <ul style="list-style-type: none"> <li>Increase in the demands food and protein supply from fishes, while large number of world's fisheries resources abundance are being depleted</li> <li>Needs to reduce negative impacts from fishing to ecosystems</li> <li>Needs improving fishing technology, including fishing gear, fishing practices, fishing vessel, deck machinery, pre and post harvesting loss includes waste and discard in fisheries, operational cost of fuel by enhancing energy optimization by consideration cost and effective</li> <li>Introduces good practices in the support fishing operations, such as luring lights, and fish aggregating devices and</li> <li>Improve safety at sea for fishers</li> </ul>		
<b>Difference from current JTF6 project (the "NEW" things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>In JTF6, SEAFDEC has projects on improvement of post-harvest fish handling, energy use and safety onboard</li> <li>In JTF7, the project puts wider on various fishing technologies, including fishing gear, fishing practices and fishing vessel machinery.</li> <li>JTF-7 also focus along the technology of fishing operation to sustain fisheries resources, reduce fish loss and waste in fisheries and support fisher safety and well being in fishing operation.</li> <li>In JTF 7, more collaboration with the other SEAFDEC Project e.g. HRD, Sustainable Utilization of Fisheries Resources in SEA, Coastal and Small scale</li> </ul>		
<b>Objective:</b> <ul style="list-style-type: none"> <li>Investigate and identify effects of various gear types and methods to fisheries resources and habitat e.g. trawling, light fishing, stationary fishing gears , and etc.</li> <li>Reduce negative impacts on fisheries resources, include ETP species, habitats and marine environment, including through handling of carbon emission</li> <li>Reduce manpower, improve living condition of fishing vessel, and enhance safety at sea in fishing operation</li> <li>Reduce fish loss and waste in fisheries both harvesting and post harvesting</li> </ul>	<b>Final goal:</b> Sustainable fisheries in Southeast Asia through fishing technology that takes ecosystem into consideration	
<b>General description on the activities in the JTF7 period (2020-2024):</b> <ul style="list-style-type: none"> <li>This project has 3 main components, 1) fishing gears and practices, including activities to support fishing operations, 2) fishing vessel, deck machinery, hauling devices and accessory to support fishing operation, such as luring light, fish aggregating devices, and 3) Pre and post-harvest techniques to improve fishing operation Through expert consultation meetings, fishing technologies and practices that impact on ecosystems in the region will be identified and prioritized in terms of these 3 components</li> <li>Organize the training program/training course of fishing technology and marine engineering for SEAFDEC MCs</li> <li>In pilot sites of Member Countries, improvements of fishing technology will be conducted based on the priorities identified, while applying and utilizing local knowledge. Series of activities include research, meeting, training will be identified based on result of consultation meetings.</li> <li>Information dissemination through various activities and media, including SEAFDEC website, brochure, publication and reports of activities</li> </ul>		
<b>Possible numerical target for quantitative evaluation:</b> <ul style="list-style-type: none"> <li>Number of new techniques developed on fishing gears, fishing operations and practices, fishing vessel and post harvest technologies</li> <li>Reduction in the impacts on marine ecosystems and in the necessary manpower in fishing operations</li> <li>Number of activities in pilot sites on the awareness building of safety at sea and on the reduce post harvest losses in fishing operation</li> </ul>		

## JTF7 Project Proposal Sheet

Project title: High Pressure Processing (HPP) of fish and fishery products	Responsible department: MFRD
<p>Background of the project:</p> <ul style="list-style-type: none"> <li>In the region, increasingly affluent consumers' demand for convenient, innovative, fresh foods, including new minimally processed foods which retain their natural flavor, colour and texture, and contain fewer additives such as preservatives</li> <li>HPP is a novel processing technology which is able to produce shelf stable products (product with extended shelf life) without heat treatment that is becoming important due to this new consumer trend in the region.</li> <li>HPP was first commercialized in Japan in the early 1990s for pasteurisation of acid foods for chilled storage and high pressure treated foods have been marketed in Japan since then, in Europe and the United States since 1996 &amp; Australia since 2001.</li> </ul>	
<p>Difference from current JTF6 project (the "NEW" things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</p> <ul style="list-style-type: none"> <li>New project to introduce the minimal processing technology, HPP, to the regional fish processing industry to meet the consumers' increasing expectations and demand for minimally processed foods which retain their natural flavor, colour and texture, and contain fewer additives such as preservatives.</li> </ul>	
<p>Objective:</p> <ul style="list-style-type: none"> <li>To investigate and develop procedures for HPP of fish and fishery products such as fish meat, oyster, lobster, crabmeat, cooked shrimp, etc.</li> <li>To add value and ensure safety, quality as well as to extend shelf-life of these products.</li> </ul>	<p>Final goal:</p> <p>To enhance regional capability and knowledge on HPP technology for processing of value added, safe and high quality fish and fishery products.</p>
<p>General description on the activities in the JTF7 period (2020-2024):</p> <p>The project will introduce HPP technology for the processing of fish and fishery products in the region with the help of regional and Japanese expertise. The project activities will include research and product development in collaboration with local institutes and or industry co-operants/partners, regional training course/workshop to introduce and disseminate the HPP technology to Member Countries:</p> <ul style="list-style-type: none"> <li>Planning and Inception Meeting, R&amp;D and product development in collaboration with local institutes and industry co-operants/partners, Regional Training Course on HPP technology, Publication of Handbook on HPP of fish and fishery products, End-of-Project (EOP) Workshop</li> </ul>	
<p>Possible numerical target for quantitative evaluation</p> <ul style="list-style-type: none"> <li>Number of competently trained participants to the meeting, training course and workshop who are able to lead the issues related to HPP of fish and fishery products in each country</li> <li>Number of HPP products developed</li> <li>Number of Handbook(s) on HPP of fish and fishery products</li> </ul>	

## JTF7 Project Proposal Sheet

Project title: Good Manufacturing Practice (GMP) guidelines for the processing and handling of Sashimi and Sushi	Responsible department: MFRD
<p>Background of the project:</p> <ul style="list-style-type: none"> <li>Sashimi and sushi are raw or minimally processed seafoods which have become very popular and widely consumed in the region</li> <li>Sashimi and Sushi are considered high-risk food items as their preparation involve extensive handling with minimum heat treatment before consumption</li> <li>Sashimi and Sushi have to be prepared, displayed and served with the highest standards of hygiene as raw seafood is prone to cross-contamination by foodborne pathogens such as <i>Vibrio parahaemolyticus</i> and <i>Salmonella</i>. As many foodborne illnesses can be caused by the consumption of Sashimi and Sushi, it is important to adopt Good Manufacturing Practice (GMP) guidelines to avoid putting the health of consumers at risk</li> </ul>	
<p>Difference from current JTF6 project (the “NEW” things about this project, in comparison to current project), necessity to implement this project in JTF7 period (2020-2024):</p> <ul style="list-style-type: none"> <li>New project to develop and harmonize GMP/Guidelines for the processing and handling of Sashimi and Sushi in the region to ensure the safety and quality of these seafood products</li> </ul>	
<p>Objective:</p> <ul style="list-style-type: none"> <li>To develop and harmonize GMP/Guidelines for the processing and handling of Sashimi and Sushi in the region</li> </ul>	<p>Final goal:</p> <p>To add value and ensure safety, quality as well as to extend shelf-life of these products through the adoption of GMP</p>
<p>General description on the activities in the JTF7 period (2020-2024):</p> <p>The project will develop and harmonize best practices for the processing and handling of Sashimi and Sushi in the region with the help of regional and Japanese expertise. The project activities will include regional technical consultations and workshops as well as pilot trials on GMP and handling practices for Sashimi and Sushi in Member Countries:</p> <ul style="list-style-type: none"> <li>Regional Technical Consultation (RTC) Meeting, Regional Workshop on GMP for processing and handling of Sashimi and Sushi, Pilot trials in Member Countries, Publication of GMP guidelines for processing and handling of Sashimi and Sushi, End-of-Project (EOP) Meeting</li> </ul>	
<p>Possible numerical target for quantitative evaluation</p> <ul style="list-style-type: none"> <li>Number of competently trained participants to the meetings and workshop who are able to lead the issues related to the processing and handling of Sashimi and Sushi in each country</li> <li>Number of pilot trials</li> <li>Number of publication(s) on GMP guidelines for processing and handling of Sashimi and Sushi</li> </ul>	

## CLOSING REMARKS

*By Dr. Kom Silapajarn,  
SEAFDEC Secretary-General*

Distinguished Members of the SEAFDEC Program Committee,  
SEAFDEC Senior Officials,  
Representatives from our Collaborating Partners,  
Ladies and Gentlemen,  
Good evening!

The Fortieth 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 with us your wisdom in dealing with SEAFDEC programs and significant issues. Thank you for your support that made this Meeting attains its objectives. Our gratitude also goes to Marine Fisheries Research Department (MFRD) and the Secretariat for their meticulous efforts to make this Meeting successful.

As what I have mentioned in my Opening Remarks, the recommendations that we have adopted in this Meeting, particularly on the programs of SEAFDEC, would be presented at the Twentieth Meeting of the FCG/ASSP. Afterward, the output of such Meeting would be presented to the upcoming SEAFDEC Council Meeting for final endorsement and approval, and inclusion in the overall activities of SEAFDEC. Once again, we are very grateful to all of you for granting us with counsel for the improvement of the SEAFDEC programs and activities, as well as guiding us to be effective in implementing the programs with respect to the needs and requirements of the Member Countries.

In conclusion, please allow me to extend our wishes to those who will leave this land of smiles before the FCG/ASSP Meeting, for you to have 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 Fortieth Meeting of the Program Committee closed.

Thank you.