

**REPORT OF
THE THIRTY-EIGHTH MEETING OF THE PROGRAM COMMITTEE
OF THE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

**Manila, Philippines
23-25 November 2015**



**THE SECRETARIAT
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

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EXECUTIVE SUMMARY

The Thirty-eighth Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Manila, Philippines, from 23 to 25 November 2015 and hosted by the Aquaculture Department (AQD). The Meeting reviewed the SEAFDEC Programs implemented in 2015 and scrutinized the programs to be implemented in 2016 to ensure that these programs have been formulated and implemented in line with the priorities and needs of the Member Countries. The list of SEAFDEC programs of activities for 2015-2016 appears as *Appendix I*. The Meeting was chaired by the Acting Secretary-General of SEAFDEC in his capacity as the Chairperson of SEAFDEC Program Committee.

The Meeting noted the progress and achievements made by SEAFDEC in the implementation of **Programs under the FCG/ASSP Mechanism** in 2015, which comprise the twenty (20) projects, 19 of which could be categorized under five Program Thrust: 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 approaches 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; and one 'Special Project'. In addition, the Program Committee noted one project scheduled to be completed in 2015, while two (2) new projects are also proposed for 2016. The Program Committee approved the programs, and provided recommendations which could be summarized as follows:

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

1. Human Resources Development (HRD) for Sustainable Fisheries

- In the training to be conducted under this project, TD to focus more on extension methodologies essential for delivering the knowledge on sustainable fisheries management to local communities
- Member Countries to put forward their requests for follow-up on-site training activities of which the budget could be allocated either through the existing JTF through SEAFDEC or from additional support

2. Optimizing Energy Use/Improving Safety Onboard in Fishing Activities

- TD to collaborate with the Philippines especially in the activities on safety at sea and design of small fishing boats
- TD to continue extending the knowledge and transfer the technology developed to fisheries extension officers in Indonesia
- Japan to consider supporting the implementation of this project especially in terms of providing resource persons from Japan

3. Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia

- TD to assess the resources near artificial reefs (ARs) considering that resource assessment has not been done near the deployed ARs in the region
- TD to dispatch experts on ARs to assist the Member Countries in the assessment of resources near ARs
- TD to determine the appropriate methodology based on basic information on biology and biodiversity collected prior to the implementation of resource enhancement activities
- TD to support the implementation of Policy Recommendations and Strategic Plans of Action for Fishery Resources Enhancement in the Southeast Asian Countries
- TD to develop a management plan after assessment of the resources is conducted in particular pilot site, and Philippines could host a pilot site for this project

4. **Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources**
 - AQD to develop other modules for environment-friendly aquaculture of economically important species, *e.g.* rice-cum-shrimp culture and technologies developed should be transferred through regional training courses
 - AQD to consider the possibility of involving researchers from Member Countries to participate in its research activities and SEAFDEC to develop the mechanism for this type of cooperation
 - AQD to share the outcomes of its projects especially on breeding of seahorses and relevant information on resource recovery technologies to the Member Countries
 - Indonesia to share the experience with other MCs on the successfully implemented rice-cum-shrimp/fish-culture

5. **Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia**
 - IFRDMD to consider including Thai researcher(s) to join field trip(s) for seed collection of eel species in its future plan
 - IFRDMD to rush up the implementation of this project especially on reviewing the status of tropical eel resources in the region with Japan supporting the implementation by sharing information on resource management of eels
 - SEAFDEC to provide training to enhance the capacity of Myanmar staff in compiling information on the abundance and status of the country's eel resources
 - Member Countries to consider attending the International Fisheries Symposium on Tropical Eel Genus *Anguilla* in Banda Aceh, Indonesia, 10-12 December 2015 concerning that scientific-based information could be established for the management and conservation of eel resources

6. **Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia**
 - IFRDMD to review the results of various activities conducted by TD and the Mekong River Commission (MRC) in relation to community and rights-based fisheries, as well as Cambodia on fisheries co-management
 - IFRDMD to collaborate with the Member Countries and TD in preparing its program of activities considering that several activities on co-management of inland fisheries has been carried out even before the establishment of IFRDMD

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

7. **Chemical and Drug Residues in Fish and Fish Products in Southeast Asia-Biotoxin (ASP, AZA and BTX) and Harmful Algal Bloom (HABs) in the ASEAN region**
 - The progress and achievements in the implementation of this project were noted

8. **Cold Chain Management of Seafood**
 - The progress and achievements in the implementation of this new project which commenced in 2015, were noted

9. **Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region**
 - AQD to explore the possibility of undertaking activities that address the urgent need to control the spread of emerging shrimp disease known as *Enterocytozoon hepatopenaei* (EHP) caused by a microsporidian parasite
 - AQD to consider strengthening its role in the ASEAN Network of Aquatic Animal Health Centres (ANAAHC) in order that the network set-up between AMSs and NACA could be actively mobilized
 - AQD to include discussions on EHP during the RTC on EMS/AHPNS and other Transboundary Diseases scheduled in February 2016 funded by Government of Japan through the ASEAN Secretariat

- SEAFDEC to consider allocating budget and include emerging issues in aquaculture such as incidence of shrimp diseases, particularly the Early Mortality Syndrome (EMS) and EHP, in the future project activities of AQD
- AQD to collaborate closely with the Member Countries in monitoring the occurrence of emerging aquatic diseases in the region
- SEAFDEC Secretariat to mobilize its existing project to provide platform for addressing emerging fisheries-related issues including those on emerging aquatic animal diseases that may arise in the future
- Thailand to join the research activities on vaccination of shrimps and enhancement of shrimp antiviral immune response to shrimp disease

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

10. Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI)

- TD to develop significant solution or best approach to deal with sustainable utilization and management of bycatch
- TD to continue and extend results of the project activities to other Member Countries
- TD to enhance the awareness of stakeholders especially the incorporation of the EAFM concept by developing mass media to increase stakeholders' awareness
- TD to support the Member Countries with the process of developing trawl fisheries management plan considering the involvement of fish meal industries/association/animal feed associations

11. Promotion of Countermeasures to Reduce IUU Fishing Activities

- SEAFDEC to provide technical support during national training course for scientific observers onboard as well as observers' onboard transshipment vessels
- Japan to consider providing technical assistance for observers' onboard training programs as officially requested by other Member Countries
- Member Countries to review their respective relevant regulations on transshipments before making a specific request for technical assistance to SEAFDEC
- SEAFDEC to support the effort of Myanmar in combating IUU fishing through training that mainly focuses on fishing vessel inspection to enhance the capacity of the country's fisheries officers from the coastal areas
- SEAFDEC to provide support to the Member Countries through the conduct of regional training or regional workshop on this aspect using the Japanese Trust Fund
- TD in collaboration with SEAFDEC Secretariat to come up with concept note on regional cooperation to support the implementation of Port State Measures within the ASEAN region to be proposed for consideration by the next SEAFDEC Council Meeting

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

- Individual countries to conduct consultation in 2016 to gather inputs on problems associated with the implementation of the guidelines, and followed by a regional technical consultation at a later stage

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

13. Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2

- Malaysia thanked TD for assistance in successful conduct of Demersal Surveys for Stock Assessment in Sabah, Sarawak and Labuan EEZs of Malaysia from 21 July to 15 October 2015
- Malaysia to use the M.V. SEAFDEC 2 for a national survey of demersal fish stocks and assessment survey in Malaysian waters (East Coast of Peninsular Malaysia) during April to June 2016

- Member Countries to fully utilize the M.V. SEAFDEC 2 after the vessel would be undertaken follow-up maintenance including renewal/replacement of survey equipment onboard with support by the Government of Japan through the JICA Program

14. Offshore Fisheries Resources Exploration in Southeast Asia

- The progress and achievements in the implementation of this project were noted

15. Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in the Southeast Asian Region

- TD to support Viet Nam through conduct of TOT on-site training course on data analysis and utilization on cost-sharing basis
- SEAFDEC to enhance the capacity of officers at the inspection and quarantine units for aquatic animals, especially in identification of sharks and rays, based on carcasses, and derivatives thereof

16. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region

- MFRDMD to update the report on status of purse seine fisheries in the region
- MFRDMD to analyze data on status of purse seine fisheries from each country and come up with regional synthesis
- SEAFDEC to dispatch experts, *e.g.* from Japan and other countries to support the assessment of major catch species by types of fishing gear
- MFRDMD to study cost-effectiveness of TAE system before TAE is put into practice
- MFRDMD to develop more options that could be applied by the countries as appropriate

17. Research and Management of Sharks and Rays in the Southeast Asian Waters

- Demarcation should be made on data collection activities for sharks and rays between MFRDMD which focus on biological aspects and methodology for species identification mainly for CITES-listed and rare species and those of TD which focus on data collection at landing sites mainly for common species
- Title of activities and publications under the projects of MFRDMD and TD should be specific for greater clarity

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

18. Assistance for Capacity Building in the Region to Address International Trade-related Issues

- Member Countries to collect basic information on the species potentially proposed for listing in the CITES Appendices, *e.g.* tunas, precious corals, other shark species, and to take actions towards sustainable utilization of the resources

19. Strengthening SEAFDEC Network for Sustainable Fisheries

- Considering the significance of this project in enhancing the visibility of SEAFDEC, the Program Committee noted the achievements of the project in 2015 and considered the proposed activities for 2016

For the Special Project on “**Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia**”, the Program Committee recommended:

- SEAFDEC to include Viet Nam in the Mekong River Basin Sub-regional arrangement
- SEAFDEC to facilitate the arrangement of another meeting between Malaysia and Thailand to review the progress of proposed actions from the First Sub-regional Technical Meeting on Effective Fisheries Resource Management
- SEAFDEC to support the plan of Thailand to develop bilateral arrangements with neighboring states for combating IUU fishing

On the Proposed New FCG/ASSP Programs for the Year 2016 and Onwards, the Program Committee provided comments and suggestions to enhance the implementation of such projects as follows:

1. Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management

- MFRDMD to formally establish the focal points of participating countries to facilitate communication and dissemination of the final project proposal and relevant documents as soon as possible
- MFRDMD to convene the inception workshop in January 2016 taking into consideration the budget from the ASEAN-SEC/IDB which would be granted in early 2016

2. USAID Oceans and Fisheries Partnership

- Project to convene formal meeting between USAID and Thailand on the project in the near future
- SEAFDEC to be represented in USAID-Oceans meetings since this is a collaborative project with SEAFDEC
- Project to consider that incorporating e-CDT system would be a big challenge for the small-scale fisheries
- Project to clearly develop mechanism for implementation considering that the project is placed under the FCG/ASSP mechanism and such mechanism should be aligned with regional initiatives to facilitate subsequent implementation by national agencies
- Project to clearly develop mechanism for implementation making sure that this could not be confused as an ASEAN project and to make sure that national agencies could take up regional initiatives into practice
- Project to make available more details on the activities including the time frame for the implementation of such activities
- Project activities should not duplicate those that are conducted by SEAFDEC
- Member Countries and all concerned to strengthen collaboration as many programs of SEAFDEC are being supported by various donors

The Program Committee also endorsed **Departmental Programs** proposed for 2016 which comprise eight continuing programs from 2015, five of which would be implemented by AQD, namely: 1) Adapting to Climate Change Impacts; 2) Healthy and Wholesome Aquaculture; 3) Maintaining Environmental Integrity through Responsible Aquaculture; 4) Meeting Socio-economic Challenges in Aquaculture; and 5) Quality Seed for Sustainable 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 which could be summarized as follows:

1. Aquaculture Department

- AQD to disseminate technology developed by AQD for producing cultivars of *Kappaphycus* using tissue culture to the private sector for application in commercial scale, specifically in the Philippines.
- AQD to consider accommodating researchers from Indonesia to be involved in research activity on feed formulation and obtain information on technology developed by AQD in this respect.

2. Training Department

- TD to consider the possibility of sharing the video clips on observation of trawl net using underwater camera through SEAFDEC/TD website
- TD to communicate with the WorldFish Center on the possibility of complementing their database on Trawl Fisheries with those of TD
- TD to continue activities to provide technical assistance for the promotion of fishing technologies and practices applicable for fishers in Thailand

The Program Committee further considered and endorsed three **Other Programs**, namely: 1) Coastal Area Capability Enhancements in Southeast Asia; 2) Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region; and 3) Technical

Exchange between Thailand and Myanmar Fisheries Scientist, which were implemented in 2015 and proposed for 2016; and noted that the experiences gained from the project implementation would be shared with all Member Countries after the completion of these projects.

Finally, the Program Committee took note of the status of the **Pipeline Project** on “Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (UNEP/GEF/SEAFDEC Project)”, and agreed that once the Project is endorsed by the CEO of GEF, the Project status would be changed from “Pipeline Project” to “On-going Project”.

The Program Committee took note of the strengthened cooperation with non-member governments and international/regional organizations, particularly the Network of Aquaculture Centres in Asia-Pacific (NACA).

The Program Committee took note of the “Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards”, which SEAFDEC was requested to consider improving the evaluation form taking into account the recommendation made by the Program Committee. Furthermore, the Program Committee also took note of the progress made by countries in the implementation of the 2011 ASEAN-SEAFDEC Resolution and Plan of Action.

With regards to the “Preparation of the High-level Consultation on Regional Cooperation in Sustainable Fisheries Development towards the ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products”, Member Countries were requested to nominate the appropriate person to serve as member of Drafting Committee and attend in the Stakeholders’ Consultation as well as the Drafting Committee Meeting to develop the draft Joint Declaration. The Program Committee further expressed the concern on the time and protocol required by each country in obtaining approval of the draft Joint Declaration as well as the process of assuring the participation of SOM to the High-level Consultation.

On the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication” (FAO SSF Guidelines), the Program Committee agreed on the development of the Regional Guidelines taking into consideration the priorities and specificity of the AMSs.

On the Southeast Asian Status of Fisheries and Aquaculture (SEASOFIA), the Program Committee took note of the draft outline of the publication, and the request for the National Coordinator to facilitate providing the necessary information to ensure that the inputs into the SEASOFIA reflect the real picture of fisheries and aquaculture in the region.

After the deliberations, the Program Committee adopted the Report of the 38th Meeting of the SEAFDEC Program Committee for submission to the 48th Meeting of SEAFDEC Council, and to the ASEAN through the 18th Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).

**PROGRAMS OF ACTIVITIES UNDER FCG/ASSP MECHANISM
FOR THE YEAR 2015-2016**

I. Programs of Activities under FCG/ASSP Mechanism

Existing programs

Program Thrust/Project Title	Lead Department	2015	2016
Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation & Food Security			
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
Thrust II: Enhancing Capacity & Competitiveness to Facilitate International and Intra-regional Trade			
7. Chemical and Drug Residues in Fish and Fish Products in Southeast Asia - Biotxin (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
Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries			
10. Strategies for Trawl Fisheries By-catch Management (FAO-GEF/REBYC-II CTI)	TD	Y	N
11. Promotion of Counter Measures to Reduce IUU fishing activities	TD/ MFRDMD	Y	Y
12. Combating IUU Fishing in the Southeast Asian Region through Application of EU Catch Certification for Trading of Fish and Fishery Products	MFRDMD	Y	Y
Thrust IV: Providing Policy & Advisory Services for Planning & Executing Management of Fisheries			
13. 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
Thrust V: Addressing International Fisheries Related Issues from a Regional Perspective			
18. 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

Special Project

Project Title	Lead Department	Period
1. Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia	SEC	2013-2017

New Projects Starting from 2016

Project Title	Lead Department	Period
1. Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (ASEAN-SEC/IDB/ SEAFDEC)	MFRDMD	2015-2017
2. USAID “Oceans and Fisheries Partnership”	SEC	2015-2019

II. Departmental Programs

Project Title	Department	2015	2016
1. Adapting to Climate Change Impacts	AQD	Y	Y
2. Healthy and Wholesome Aquaculture	AQD	Y	Y
3. Maintaining Environmental Integrity through Responsible Aquaculture	AQD	Y	Y
4. Meeting Socio-economic Challenges in Aquaculture	AQD	Y	Y
5. Quality Seed for Sustainable 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	2015	2016
1. Coastal Area Capability Enhancements in Southeast Asia (SEAFDEC/RIHN Collaborative Project)	TD	Y	Y
2. Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region (ACIAR supported Project)	TD	Y	Y
3. Technical Exchange between Thailand and Myanmar Fisheries Scientists	SEC	Y	N

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

Project Title	Lead Department	Period
Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand (UNEP/GEF/SEAFDEC)	TD	2015-2019

Y = Program/project implemented during the year

N = Program/project not implemented during the year

CONTENTS

	Paragraph No.
INTRODUCTION	1-2
I. OPENING OF THE MEETING	3
II. ADOPTION OF THE AGENDA AND ARRANGEMENTS OF THE MEETING	4-5
III. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2015 AND PROPOSED PROGRAMS FOR THE YEAR 2016	6
3.1 Programs under the FCG/ASSP Mechanism	7-72
3.2 Departmental Programs	73-81
3.3 Other Program	82-85
IV. PIPELINE PROJECTS AND EMERGING NEEDS FOR PREPARATION OF FUTURE PROJECT PROPOSALS	86
V. COOPERATION WITH DONORS, NON-MEMBER GOVERNMENT AND INTERNATIONAL/REGIONAL ORGANIZATIONS	87-88
VI. OTHER PROGRAM MANAGEMENT MATTERS	
6.1 Monitoring and Evaluation of SEAFDEC Programs for 2015 and Owards	89-92
6.2 Review of the Implementation of the 2011 ASEAN-SEAFDEC Resolution and Plan of Action	93-95
6.3 High-Level Consultation on Regional Cooperation in Sustainable Fisheries Development Towards the ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products	96-101
6.4 Issues on FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication	102-105
6.5 SEASOFIA	106-108
VII. CONCLUSIONS AND RECOMMENDATIONS OF THE THIRTY-EIGHTH MEETING OF THE PROGRAM COMMITTEE	
7.1 Adoption of Report of the Meeting	109
7.2 Date and Venue of the Thirty-ninth Meeting of the Program Committee	110
VIII. CLOSING OF THE MEETING	111

ANNEXES

Annex		Page
1.	List of Participants	17
2.	Opening Remarks by <i>Mr. Hajime Kawamura</i> , Acting SEAFDEC Secretary-General	27
3.	Agenda	29
4.	Programs under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism for the Year 2015-2016	33
5.	New Proposed Projects for the Year 2016 and Onwards	201
6.	SEAFDEC Departmental Programs of Activities for the Year 2015-2016	233
7.	Other Programs	285
8.	Pipeline Projects and Emerging Needs for Preparation of Future Project Proposals	299
9.	Statement by <i>Dr. Cherdasak Virapat</i> , Network of Aquaculture Centres in Asia-Pacific (NACA)	303
10.	Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards	305
11.	Review of the Implementation of the 2011 ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region by the ASEAN Member Countries (2011-2014)	313
12.	High-Level Consultation in Regional Cooperation in Sustainable Fisheries Development Towards the ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products	355
13.	International Guidelines for Securing Sustainable Small-Scale Fisheries and Way Forward for Southeast Asian Region	341
14.	Preparation for Southeast Asian State of Fisheries and Aquaculture (SEASOFIA) 2017	359
15.	Closing Remarks by <i>Mr. Hajime Kawamura</i> , Acting SEAFDEC Secretary-General	367

LIST OF ACRONYMS

AEG-CITES	ASEAN Experts Group on the Convention on International Trade in Endangered Species of Wild Fauna and Flora
ACDS	ASEAN Catch Documentation Scheme
ACDT	ASEAN Catch Documentation and Traceability
ACIAR	Australian Centre for International Agricultural Research
AMAF	ASEAN Ministers on Agriculture and Forestry
AMSs	ASEAN Member States
ANAAHC	ASEAN Network of Aquatic Animal Health Centres
APFIC	Asia Pacific Fisheries Commission
AQD	SEAFDEC Aquaculture Department
ARs	Artificial Reefs
ASEAN	Association of Southeast Asian Nations
ASSP	ASEAN-SEAFDEC Strategic Partnership
ASWGFⁱ	ASEAN Sectoral Working Group on Fisheries
BOBLME	Bay of Bengal Large Marine Ecosystem
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CTI-CFF	Coral Triangle Initiative – Coral Reefs, Fisheries and Food Security
DOF	Department of Fisheries
EAFM	Ecosystem Approach to Fisheries Management
EEZs	Exclusive Economic Zones
EMS	Early Mortality Syndrome
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FCG	ASEAN-SEAFDEC Fisheries Consultative Group
GEF	Global Environmental Facility
IDB	Islamic Development Bank
IFRDMD	SEAFDEC Inland Fishery Resources Development and Management Department
IUU Fishing	Illegal, Unreported and Unregulated Fishing
JICA	Japan International Cooperation Agency
JTED	Juveniles and Trash Excluder Devices
JTF	Japanese Trust Fund
KPI	Key Performance Indicators
LGU	Local Government Units
MCS	Monitoring, Control and Surveillance
MFRD	SEAFDEC Marine Fisheries Research Department
MFRDMD	SEAFDEC Marine Fishery Resources Development and Management Department
MRC	Mekong River Commission
NACA	Network of Aquaculture Centres in Asia-Pacific
PCM	SEAFDEC Program Committee Meeting
PSM	Port State Measures
RFMOs	Regional Fisheries Management Organizations
RFPN	Regional Fisheries Policy Network
RFVR	Regional Fishing Vessels Record (for fishing vessels 24 meters in length and over)
RIHN	Research Institute for Humanity and Nature, Japan
RTC	Regional Technical Consultation
SEAFDEC	Southeast Asian Fisheries Development Center
SEASOFIA	Southeast Asian State of Fisheries and Aquaculture
SOM-AMAF	Senior Officials Meeting of the ASEAN Ministers on Agriculture and Forestry
TAC	Total Allowable Catch
TAE	Total Allowable Effort
TD	SEAFDEC Training Department
UNEP	United Nations Environmental Programme
USAID	U.S. Agency for International Development
VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission

**REPORT OF THE THIRTY-EIGHTH MEETING OF THE PROGRAM COMMITTEE
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

**Manila, Philippines
23-25 November 2015**

INTRODUCTION

1. The Thirty-eighth Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Manila, Philippines from 23 to 25 November 2015 and hosted by the Aquaculture Department (AQD).
2. The Program Committee Meeting was attended by the SEAFDEC Program Committee Members for Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam together with their respective delegations as well as representatives from collaborating partners of SEAFDEC, namely: the United States Agency for International Development (USAID)/Oceans and Fisheries Partnership, and USAID/Regional Development Mission for Asia. SEAFDEC Acting Secretary-General and Department Chiefs as ex-officio members of the SEAFDEC Program Committee together with officers from the SEAFDEC Secretariat and the Departments also attended the Meeting. The list of participants appears as **Annex 1**.

I. OPENING OF THE MEETING

3. The Chief of AQD *Dr. Felix G. Ayson* welcomed the participants to the Meeting and to the Philippines, and wished them pleasant stay in Makati City, the location of the venue of the Meeting. The Acting Secretary-General of SEAFDEC *Mr. Hajime Kawamura*, informed the Meeting that due to the pending appointment of the new SEAFDEC Secretary-General, the duty of Meeting Chairperson would have to be carried out by himself as the Acting Secretary-General. Thus, on behalf of the Secretary-General as Chairperson of the Program Committee, he stated that as in previous years, the order of the review of implementation of the SEAFDEC programs starts with the Programs under the FCG/ASSP Mechanism followed by Departmental Programs, Other Programs, and Pipeline Project. He mentioned that as SEAFDEC is already at the threshold of its Golden Anniversary in 2017, relevant activities would be undertaken to commemorate this jubilee. He then reiterated that the output of the Meeting together with the recommendations would be submitted to the forthcoming meeting of the SEAFDEC Council for consideration and approval, as well as to the ASEAN Sectoral Working Group on Fisheries (ASWGF_i) through the 18th Meeting of the FCG/ASSP to be held back-to-back with the 38th Meeting of the Program Committee. After pointing out the need to continue promoting the sustainable development of fisheries in the region and enhance the role of fisheries in the unified ASEAN Economic Community which is already in the offing, he declared the Thirty-eighth Meeting of the Program Committee Meeting. His Opening Remarks appears as **Annex 2**.

II. ADOPTION OF THE AGENDA AND ARRANGEMENTS OF THE MEETING

4. After informing the Program Committee that the Meeting Agenda includes evaluation of the SEAFDEC programs, the Chairperson also explained that there is a need to evaluate the programs of SEAFDEC based on the format approved by the SEAFDEC Council. The Program Committee was therefore requested not only to closely examine the SEAFDEC programs implemented in 2015 including those proposed for 2016, for improvement to ensure that these are suitable for the requirements of the region, but also to carry out the necessary program evaluation for submission to SEAFDEC Secretariat at the end of the Meeting.
5. The Agenda which appears as **Annex 3** was adopted.

III. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2015 AND PROPOSED PROGRAMS FOR THE YEAR 2016

6. The Program Committee took note of the various projects under the FCG/ASSP Mechanism which have been categorized based on the SEAFDEC Program Thrusts including one special project and two new projects proposed for 2016, Departmental Programs, and Other Programs. The progress and achievements of the projects in 2015 and the proposed programs of activity for 2016, were reported by the SEAFDEC Secretariat and Departments.

3.1 Programs under the FCG/ASSP Mechanism

7. The Program Committee noted the progress and achievements made by the Secretariat and the Departments in the implementation of 20 on-going projects in 2015, as well as the two new projects proposed for 2016 (**Annex 4**). The observations made and recommendations raised by the Program Committee for the improvement of the projects and activities are shown below:

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

(1) Human Resource Development for Sustainable Fisheries

8. While commending SEAFDEC/TD for developing the training curriculum that anchors on the Ecosystem Approach to Fisheries Management (EAFM), the Program Committee Member for Viet Nam expressed the apprehension that as the training on EAFM had been conducted in conjunction with the training on extension methodologies, target participants could be different, *i.e.* target participants for EAFM training are the policy makers and planners, while for extension methodologies the target participants are extension officers. This resulted in difficulties of the countries to select the appropriate participants to attend such integrated training course. Therefore, the Program Committee Member for Viet Nam also expressed the view that the training to be conducted under this project should focus more on extension methodologies, as this is essential for delivering the knowledge on sustainable fisheries management to local communities.

9. Considering that no on-site training activities had been implemented in 2015 nor proposed for 2016, the representative from Japan encouraged the Member Countries (MCs) to put forward their requests for follow-up on-site training activities, the budget of which could be explored either through the existing JTF through SEAFDEC or additional support based on such requests.

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

10. The Program Committee Member for the Philippines supported the implementation of the project considering that this could mitigate the risks encountered by small-scale fishers while fishing, and looked forward to collaborating with TD especially on the activities on safety at sea and design of small fishing boats. In addition, the Program Committee Member for Indonesia while commending TD for the conduct of on-site training in Indonesia in 2014 considering the benefits derived by Indonesian fishers from such training, asked SEAFDEC to continue extending the knowledge and transferring the technology developed to fisheries extension officers in Indonesia. In this regard, the representative from Japan informed the Program Committee the possibility that Japan would support the implementation of this project especially in terms of providing resource persons from Japan as necessary.

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

11. With regard to the critical habitats/fishing grounds specifically near the artificial reefs (ARs) which are widely deployed in the Southeast Asian marine waters, MFRDMD suggested that TD could include in this project an assessment of the resources near ARs considering that resource assessment has not been done near the deployed ARs in the region. In response, TD could assist the Member Countries on this aspect by dispatching experts on ARs who could assist the countries in the assessment of resources near ARs.

12. The Program Committee Member for Brunei Darussalam informed the Meeting that the country has actively deployed ARs using decommissioned oil rigs since the 1980s, and expressed willingness to cooperate with TD to assess the condition of deployed ARs in the country.

13. In response to the query of the representative from Japan on the location of the pilot sites for this project, TD indicated that currently the pilot sites are in Lao PDR (for inland waters) and in the southern part of Thailand (Krabi Province for seagrass beds). However, other pilot sites could be determined taking into consideration the requests made by the Member Countries.

14. The Program Committee Member for Thailand suggested that prior to the implementation of resource enhancement activities, basic or baseline information on biology and bio-diversity is necessary to determine the appropriate methodology for enhancing fishing grounds and habitats. The EAFM concept could also be considered in developing plans for resource enhancement especially for ARs.

15. The Meeting was also informed that policy recommendations for resource enhancement were developed during the SEAFDEC Symposium on Strategy for Fisheries Resources Enhancement in the Southeast Asian Region in July 2015, and TD should consider supporting the implementation of such recommendations.

16. The Program Committee Member for Philippines reiterated that during the assessment of the resources, management plan should also be developed specifically in particular pilot site, and that Philippines could host a pilot site for this project, such as the Coral Garden Project. In addition, TD was also asked to consider establishing/formulating management measures as one of the goals for this project.

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

17. While congratulating AQD for implementing this project, the Program Committee Member for Viet Nam suggested that AQD should develop other modules for environment-friendly aquaculture of economically important species, *e.g.* rice-cum-shrimp culture, which is the growing of rice and culture of black tiger shrimp in alternate seasons, and that the technologies developed should be transferred through the conduct of regional training courses. In addition, AQD could also consider the possibility of involving researchers from Member Countries to participate in its research activities. It was however explained that the Member Countries should think about the long-term duration of the research, before sending their researchers to AQD to take part in relevant research activities. The Program Committee Member for Viet Nam also requested AQD to develop the mechanism for this type of cooperation.

18. The Meeting was also informed that Indonesia has successfully implemented rice-cum-shrimp/fish-culture, and several training courses on this topic had been conducted under the South-South Cooperation sponsored by FAO. In addition, development of demonstration units covering an area of about 25 ha is underway in Yogyakarta, also in collaboration with FAO. Indonesia is willing to share the experience that it had gained from such activity with the other MCs.

19. Considering that this project also covers community-based integrated production and resource enhancement of seahorses species which are listed the CITES Appendix II, the representative from Japan suggested that AQD should share the results of the project especially on breeding of seahorses and relevant information on the resource recovery technologies, with the Member Countries.

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

20. While supporting the implementation of this project as eel is an economically important species in the region, the Program Committee Member for Thailand informed the Meeting that although eel species are available in the country's coast in the Andaman Sea, no commercial seeds have been collected in Thailand for culture. In this connection, IFRDMD was asked to also include Thai researcher(s) to join the field trip(s) for seed collection in its future plans.

21. The representative from Japan, while urging IFRDMD to rush up the implementation of this project to avoid listing of eel species in CITES Appendices, also suggested that at the initial stage review the status of tropical eel resources in the region should be undertaken, after which the countries should make the strategies or plans for resource management. In this connection, Japan could support the implementation of the project not only in terms of budget but also in dispatching experts on resource management of eels.
22. While commending SEAFDEC in publicizing the status of eel resources in Southeast Asia through the *Fish for the People*, the Program Committee Member for Myanmar shared the information on the abundance of glass eels in Myanmar, especially the *Anguilla* spp. in the coasts of Rakhine State along the Andaman Sea, and that the government has been distributing glass eels to promote eel culture as livelihood as well as export potential. However, since the country needs to improve the capacity of its technical staff in compiling information on the abundance and status of the country's eel resources, SEAFDEC was asked to provide training to enhance the capacity of the staff from Myanmar on this aspect.
23. While the Program Committee Member for Thailand suggested that an evaluation of the project should be conducted to conclude the first phase of the project before going to the next phase, the Deputy Chief of IFRDMD explained that information on eel resources in Indonesia and the Philippines could already be compiled based on results of the survey. Meanwhile, IFRDMD could also conduct a survey visit in Myanmar to study the eel resources of the country based on the latest information provided by Myanmar, as well as in Thailand considering that Thailand and Myanmar share the same coast of the Andaman Sea.
24. The Program Committee was also informed that the International Symposium on the Tropical Eel Genus *Anguilla* would be organized in Banda Aceh, Indonesia on 10-12 December 2015, and that IFRDMD intends to attend the Symposium in which case the workshop which IFRDMD proposed to organize in November 2015 would be postponed and rescheduled in early 2016. In this connection, the Member Countries were encouraged to attend the workshop to be considering that scientific-based information would be established for the management and conservation of eel resources.
25. The representative from Japan requested the Government of Indonesia to consider providing further support to this activity being one of the biggest resource users. In response, the Program Committee Member for Indonesia indicated that the Government of Indonesia has already allocated funds to support this project, and that close collaboration is made between Indonesia and IFRDMD to support the activities, and Indonesia is looking forward to developing the technologies for the management and conservation of eel resources.

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

26. On the query of the Program Committee Member for Viet Nam about the methodologies used to conduct the study on co-management and right-based fisheries management applicable to inland fisheries in region, the Deputy Chief of IFRDMD explained that initial study to review the type of co-management or right-based fisheries management applicable for the region is necessary considering the different situations of the countries. Moreover, the results of such study are discussed with local governments for possible implementation of the applicable approaches. In addition, the Program Committee Member for Viet Nam informed the Meeting that although results of implementation of the country's co-management activities could be shared with other countries, the reports are in the Vietnamese language.
27. The SEAFDEC Senior Advisor also suggested that IFRDMD could review the results of various activities conducted by TD and the Mekong River Commission (MRC) in relation to community- and rights-based fisheries, as well as the efforts of Cambodia in fisheries co-management for many years that led to enactment of the country's Community Fisheries Laws.
28. Considering that TD already conducted several activities on co-management of inland fisheries before the establishment of IFRDMD, the representative from Japan suggested that IFRDMD should collaborate with the Member Countries and TD in preparing its program of activities.

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

(7) Chemical and Drug Residues in Fish and Fish Products in Southeast Asia-Biotoxin (ASP, AZA and BTX) and Harmful Algal Blooms (HABs) in the ASEAN region

29. The Meeting noted the progress and achievements in the implementation of this project.

(8) Cold Chain Management of Seafood

30. The Meeting noted the progress and achievements in the implementation of this new project which was started in 2015.

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

31. The representative from Thailand requested AQD to explore the possibility of undertaking activities that address the urgent need to control the spread of emerging shrimp disease known as *Enterocytozoon hepatopenaei* (EHP) caused by a microsporidian parasite. In this connection, the Program Committee Member for Viet Nam expressed the concern on the need for SEAFDEC to develop a mechanism to deal with emerging issues such as the occurrence of EHP in the region.

32. The Meeting however recalled that NACA is the main agency dealing with aquatic animal health with the capacity to address emerging diseases through the ASEAN Network of Aquatic Animal Health Centres (ANAAHC) of which focal points of the ASEAN Member States (AMSs) have already been established for networking among national aquatic animal health agencies. As one of the partners, SEAFDEC/AQD provides support to AMSs in the implementation of research on aquatic disease control. In this regard, the Program Committee Member for Thailand suggested that AQD could also consider strengthening its role in the ANAAHC in order that the network set-up between AMSs and NACA could be actively mobilized.

33. Moreover, in response to the request for support and technical assistance to the Member Countries on this aspect, it was clarified that AQD is willing to share the results of its research on aquatic diseases but the mechanism for mobilizing the countries' budget for this purpose does not exist. Nevertheless, the Meeting was informed that during the RTC on EMS/AHPNS and other Transboundary Diseases scheduled in February 2016 with funding support from Japan through the ASEAN Secretariat, discussions on EHP as requested by the Program Committee could be accommodated.

34. Considering the urgent need to address emerging issues related to aquatic diseases, the Program Committee Member for Viet Nam requested AQD to consider having more flexibility in the planned activities in order that emerging issues in aquaculture such as the incidence of shrimp diseases, particularly the Early Mortality Syndrome (EMS) and EHP, could be considered and addressed. In addition, AQD was also asked to collaborate closely with the Member Countries in monitoring the occurrence of emerging aquatic diseases in the region.

35. The Program Committee was also informed of the existing project of the SEAFDEC Secretariat that aims to provide platform for addressing emerging fisheries-related issues including those on emerging aquatic animal diseases that may arise in the future, could also be mobilized.

36. The Program Committee Member for Thailand expressed the interest of the country to send its researchers to join the research activities especially in vaccination of shrimps and enhancement of shrimp antiviral immune response to shrimp disease.

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

(10) Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI)

37. The Program Committee Member for Indonesia sought the clarification of TD on the impact evaluation of this project, especially on whether the project could recommend any significant solution or best approach to deal with sustainable utilization and management of bycatch. In this regard, it was explained that Phase I of the project which promoted the use of Juveniles and Trash Excluder Devices (JTEDs) had demonstrated the reduction of bycatch in trawl fisheries, as in the case of the Philippines. Although Indonesia was requested to collaborate in monitoring bycatch reduction in Indonesian trawl fisheries, the country was not able to support such activity due to the fact that while trawls have been banned since 1980s, fishing gears resembling trawls or their look-alikes have also been banned since early 2015.

38. As for Phase II of this project, the Meeting was informed that some AMSs are developing Trawl Fisheries Management Plans such as Indonesia, Philippines, Thailand, and Viet Nam. The Program Committee Member for the Philippines also informed the Meeting that a Management Plan has been developed to protect the fisheries resources in Samar Sea, and suggested that this project could be continued and the results could be shared with other Member Countries.

39. Considering the need to enhance the awareness of stakeholders on this project especially the incorporation of the EAFM concept, the Program Committee Member for Thailand suggested that mass media should be produced and disseminated to increase stakeholders' awareness.

40. While commending TD for applying the EAFM concept in this project, the Program Committee Member for Viet Nam suggested that TD could continue supporting the Member Countries in the process of developing trawl fisheries management plan. However, since the project would be completed in June 2016, SEAFDEC was asked to consider continuing its support in the implementation of the management plan on trawl fisheries considering that this involves the fish meal industries/association/animal feed associations.

(11) Promotion of Countermeasures to Reduce IUU Fishing Activities

41. With regard to the utilization of the RFVR Database, the Program Committee Member for Malaysia informed the Meeting that this is very useful in undertaking enforcement activities especially when it comes to issues related to foreign vessels. As Malaysia already has its own country-based fishing vessel record database which is more detailed based on local needs, such database would be maintained for the use of the Department of Fisheries and other relevant national fisheries agencies. Nevertheless, having both databases, *i.e.* country-based and regional-based could be highly advantageous to the Member Countries, especially in maintaining data integrity and continuity.

42. The Program Committee for Thailand informed the Meeting that Thailand has already launched its national policy to reduce IUU fishing and has improved its catch data record and vessel registration to combat IUU fishing. As Thailand is planning to conduct a national training course for observers onboard, SEAFDEC was asked to provide technical support on such training course in Bangkok, Thailand. SEAFDEC was also requested to provide technical support for the conduct of a training course on observers' onboard in transshipment vessels, which is compulsory for overseas fleet under IPOA-IUU as well as RFMOs. The trainers could come from IOTC or WCPFC or any RFMOs in order that the participants could be certified as observers. In this connection, the representative from Japan informed the Meeting that Japan which has extensive experiences on observers' onboard program could consider providing technical assistance on this aspect based on official requests from the other Member Countries.

43. The Meeting was informed that inviting RFMOs to the observers' onboard training in transshipment vessels would need consensus from the Member Countries, and that SEAFDEC could only help in providing technical assistance but not in conducting the said training. Moreover, the countries should review their respective relevant regulations on transshipments before making a specific request for technical assistance from SEAFDEC.

44. The Program Committee for Myanmar informed the Meeting that the country is developing its National Plan of Action for combating IUU Fishing (NPOA-IUU) which is expected to be completed by 2016 under a trade development project supported by EU. In this connection, SEAFDEC was asked to support the effort of Myanmar in combating IUU fishing through the conduct of training that mainly focuses on fishing vessel inspection to enhance the capacity of the country's fisheries officers from the coastal areas.

45. In order to address the requirements of the Member Countries for training, SEAFDEC was asked to provide support to the countries through the conduct of regional training or regional workshop.

46. The Meeting was also informed that under this project, TD in collaboration with SEAFDEC Secretariat would come up with a concept note on regional cooperation to support the implementation of Port State Measures Agreement within the ASEAN region which will be proposed for consideration by the next SEAFDEC Council Meeting.

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

47. While commending SEAFDEC for developing the Guidelines for Preventing the Entry of Fish and Fishery Products into the Supply Chain as it could be used in harmonizing intra-regional trade, the Program Committee Member for Viet Nam sought clarification on the consultation to be conducted in 2016. In respond, MFRDMD indicated that such consultation will be conducted with individual countries to gather inputs on problems associated with the implementation of the guidelines, and could be followed by a regional technical consultation at the later stage.

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

(13) Fisheries Resource Survey & Operational Plan for the M.V. SEAFDEC 2

48. While expressing the sincere appreciation of Malaysia for the successful conduct of demersal surveys for stock Assessment in Sabah, Sarawak and Labuan EEZs from 21 July to 15 October 2015, the Program Committee Member for Malaysia also commended the TD scientists and crew of the M.V. SEAFDEC 2 for their high commitments and professionalism during the conduct of the surveys. Moreover, the Meeting was also informed that the Department of Fisheries Malaysia has proposed the utilization of M.V. SEAFDEC 2 for a national survey of demersal fish stocks and assessment survey in Malaysian waters (East Coast of Peninsular Malaysia) during April to June 2016.

49. The representative from Japan informed the Meeting that follow-up maintenance of the M.V. SEAFDEC 2 would be undertaken in 2016 including renewal/replacement of survey equipment onboard with support by the Government of Japan through the JICA Program. He further therefore encouraged the Member Countries to fully utilize the M.V. SEAFDEC 2 in the future.

(14) Offshore Fisheries Resources Exploration in Southeast Asia

50. The Program Committee noted the progress and achievements in the implementation of the project on Offshore Fisheries Resources Exploration in Southeast Asia in 2015, as well as the proposed activities for 2016.

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

51. On the sub-project on "Facilitating Fisheries Activity Information Gathering Through Introduction of Community-based Resources Management," the Program Committee Member for Viet Nam expressed gratitude to SEAFDEC for arranging the training courses for local communities in Viet Nam on resources management considering that Viet Nam has developed the tools for data collection in pilot sites in local communities making use of the tools developed by TD. Moreover, the Meeting was informed that the data collected using such tools would be analyzed and used to support fisheries management in the

communities. In this regard, SEAFDEC was requested to support Viet Nam through conduct of Training of Trainers On-site Training Course on Data Analysis and Utilization on cost-sharing basis.

52. For the sub-project on “Improving the Data Collection of the Commercially-Exploited Aquatic Species and Threatened Species”, the Program Committee Member for Thailand emphasized the need to enhance the capacity of officers, especially at the inspection and quarantine units for aquatic animals in the identification of sharks and rays, based on carcasses and derivatives thereof.

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

53. In respond to the query of the Program Committee Member for Viet Nam on the use of Total Allowable Catch (TAC) system compared with other systems such as Total Allowable Effort (TAE) as suggested by Japan during the Thirty-Seventh Program Committee Meeting, MFRDMD indicated that TAE would be more applicable for the region than TAC considering the multi-species characteristics of fisheries in the region. As for the report on the status of purse seine fisheries in the region, the Meeting was informed that MFRDMD is planning to update the report on this fisheries while it was also suggested that MFRDMD should analyze the data from each country and come up with regional synthesis.

54. The Program Committee Member for Thailand informed the Meeting that the country plans to assess major catch species by types of fishing gear and requested SEAFDEC to dispatch experts, *e.g.* from Japan and other countries, to support such activities. Furthermore, Thailand also suggested that cost-effectiveness of TAE system should be studied before TAE is put into practice.

55. The representative from Japan pointed out that both TAC and TAE are options for resources management which could be appropriate for different situations and suggested that MFRDMD should provide more options that could be applied by the countries as appropriate.

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

56. In response to the query of the Program Committee Member for Viet Nam on the demarcation of the activities on data collection on sharks and rays implemented by MFRDMD and TD, it was clarified that the original plan was for MFRDMD to focus on biological aspects. For species identification, common species were focused during the training of enumerators conducted by TD while MFRDMD was also requested to collect and store specimens of every species for further analysis and species identification.

57. While sharing the concern on unclear delineation of work between MFRDMD and TD on this aspect, the Program Committee Member for Singapore suggested that the title of activities and publications under the projects of MFRDMD and TD should be specific for greater clarity.

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

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

58. The representative from Japan shared the information on CITES-related issues specifying that in addition to Japanese and the Indonesian shortfin eels, other commercially important species could be potentially proposed for listing in the CITES Appendices during the next CITES COP 17, *e.g.* tunas, precious corals and other shark species. Considering that listing of these species could impact on trade, the Member Countries were therefore encouraged to collect relevant information on the species and to take actions towards the sustainable utilization of these resources.

(19) Strengthening SEAFDEC Network for Sustainable Fisheries

59. Considering the significance of this project in enhancing the visibility of SEAFDEC, the Meeting noted the achievements of the project in 2015 and supported the conduct of the proposed activities in 2016.

3.1.6 Special Project

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

60. While commending the implementation of the SEAFDEC-Sweden collaborative project in the region through sub-regional mechanism which has benefited the concerned countries, the Program Committee Member for Viet Nam requested to include Viet Nam in the Mekong River Basin Sub-regional arrangement, and requested that implementation of activities under this project should be expedited, particularly the development of joint fisheries management plan for important species.

61. The Program Committee Member for Lao PDR expressed the gratitude of Lao PDR to the SEAFDEC-Sweden Project for implementing activities in the country as these are important for the sustainable development of inland fisheries in Lao PDR, especially the E-EAFM training in Champasak Province on 2-7 November 2015, and looked forward to the conduct of the Training for Trainers on E-EAFM in Lao PDR in the near future.

62. The Program Committee Member for Malaysia also thanked SEAFDEC for the implementation of this project, especially in addressing priority issues that have been raised during the Gulf of Thailand Sub-regional Meetings, and informed the Meeting that under the platform of the Malaysia-Thailand bilateral arrangement, Malaysia and Thailand have agreed to sign the relevant MOU. In this connection, the SEAFDEC-Sweden Project was asked to facilitate the arrangement of another meeting between Malaysia and Thailand to review the progress of proposed actions raised during the First Sub-regional Technical Meeting on Effective Fisheries Management held on 14-15 May 2014 in Penang, Malaysia.

63. While agreeing with the Program Committee Member for Malaysia, the Program Committee Member for Thailand added that the country would establish bilateral arrangements with its neighboring states in conjunction with the implementation of the new policy on combating IUU fishing. While the establishment of bilateral arrangements could be undertaken by the respective countries, SEAFDEC was requested to provide technical support to the activities that would be conducted under these arrangements.

3.1.7 New Projects from 2016

64. While considering the new programs proposed for 2016 (**Annex 5**), the Program Committee offered recommendations for the improvement of the programs and endorsed the proposed programs taking into consideration the recommendations as shown below:

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

65. In order to implement this project, the Program Committee Member for Brunei Darussalam requested MFRDMD to formally establish the focal points of participating countries to facilitate communication, and dissemination of the final project proposal and relevant documents as soon as possible as these are essential for the discussion during the planned inception workshop. The said inception workshop is proposed to be held in January 2016 due to the busy season in December. In this connection, it was agreed that the inception meeting would be convened in early 2016 taking into consideration the budget from the ASEAN-SEC/IDB which would be granted in early 2016. In addition, all the relevant documents would be sent to the participating countries through the focal points. The Program Committee Members for Indonesia and Malaysia also supported the implementation of this project as well as on the rescheduling of the inception workshop in January 2016.

(2) USAID Oceans and Fisheries Partnership

66. Considering that a consultation between USAID Oceans and Fisheries Partnership (USAID-Oceans) and Thailand on the project has not yet been organized, the Program Committee Member for Thailand looked forward to having a formal meeting with USAID-Oceans in the near future.

67. While expressing the support of Malaysia to this project as it is beneficial to the country, the Program Committee Member for Malaysia expressed the concern on the non-representation of SEAFDEC in the recent USAID-Oceans consultation visit to the Department of Fisheries Malaysia, and suggested that henceforth SEAFDEC should be present at meetings to be conducted between USAID-Oceans and AMSs since this is a collaborative project with SEAFDEC.

68. The Program Committee Member for Viet Nam shared the view that the project is beneficial to the country, however, incorporating e-CDT system as planned would be a big challenge for the small-scale fisheries. She requested that the mechanism for implementation should be clearly developed considering that the project is placed under the FCG/ASSP mechanism. Moreover, it is also important for the mechanism to be aligned with regional initiatives to facilitate subsequent implementation by national agencies.

69. The Program Committee Member for Indonesia also expressed the support of Indonesia to the implementation of the activities, however, the activities with the corresponding time frame for the implementation should be discussed with agencies that will be involved in the implementation in order to share and coordinate the national responsibility.

70. The representative from Japan expressed the concern that some of the activities planned under the project appear to be similar to the on-going projects of SEAFDEC, *e.g.* the development of ACDT system and ACDS, and therefore requested that efforts should be made by the project to avoid duplication of activities but harmonize these with other related projects.

71. In respond, the Meeting was informed that the mechanism for implementation of this project between USAID-Oceans, SEAFDEC and the AMSs, would be developed taking into consideration the suggestions raised at this Meeting and making sure that there are no duplication of activities.

72. It was also noted that as there are many programs of SEAFDEC being supported by various donors, it has become necessary that collaboration among projects towards similar goals should be strengthened to ensure that these projects are complimentary with each other.

3.2 Departmental Programs

73. While considering the progress and achievements in the implementation of SEAFDEC Departmental Programs in 2015 and the proposed programs for 2016 (**Annex 6**), the Program Committee offered recommendations for the improvement of the programs and endorsed the proposed programs taking into consideration the following recommendations.

3.2.1 Aquaculture Department

74. For the progress and achievements of the programs of AQD in 2015 including the results of R&D activities under the five thematic programs, namely: Quality Seed for Sustainable Aquaculture, Healthy and Wholesome Aquaculture, Maintaining Environmental Integrity through Responsible Aquaculture, Adapting to Climate Change and Meeting Social and Economic Challenges in Aquaculture, the Meeting made the following observations and recommendations:

75. In response to the query of the Program Committee Member for Malaysia on the dissemination of the technology developed by AQD for producing cultivars of *Kappaphycus* using tissue culture to the private sector for application in commercial scale, specifically in the Philippines, it was clarified that AQD has conducted training on production of cultivars from laboratory in land-based and sea-based nurseries and provided technical assistance to seaweed farmers to facilitate application of the technology. Some

trainees from BFAR laboratory and local government units (LGU) in Mindanao had already established tissue culture laboratories that could produce cultivars for their localities.

76. While congratulating AQD for the excellent work done, the Program Committee Member for Singapore inquired whether the integrated multi-trophic aquaculture had been put into practice in large-scale farms. In response, it was clarified that multi-trophic culture of milkfish, seaweed, and sandfish has been successfully adopted by farmers in Guimaras Province as well as in other areas in the Philippines.

77. The Program Committee Member for Indonesia expressed the willingness to send researchers from Indonesia to be involved in research activity on feed formulation and obtain information on technology developed by AQD in this respect. However, it was clarified that the relevant materials produced by AQD had been published and could be accessible for free through its website. Researchers from the Member Countries could also attend the training course on feed formulation which is regularly conducted by AQD.

3.2.2 Training Department

78. While taking note of the progress and achievements of the Departmental Programs of TD under three groups, namely: 1) Promotion and Strengthening of SEAFDEC Visibility and Image; 2) Tailor-made Training Programs; and 3) Improvement of Fisheries Technology and Reduction of the Impact from Fishing, the Program Committee provided recommendations and agreed to endorse the said programs and activities.

79. Considering the relevance of the project on “Promotion of Appropriate Technologies and Practices of Fishing and Marine Engineering” especially the activity on underwater camera system for observing trawl nets, the Program Committee Member for Malaysia requested TD to consider the possibility of sharing the video clips produced from such activity through SEAFDEC/TD website. In response, TD indicated that video clips on this aspect are already available and could be shared through SEAFDEC/TD website.

80. With regard to the development of a database system by TD, the Chief of MFRDMD informed the Meeting that the WorldFish Center had developed the Database System on Trawl Fisheries based on collaborative efforts with partners and that this database system has been ceased during the past few years. The DOF Malaysia asked the WorldFish Center to consider the possibility of reviving the said system. In this connection, TD will communicate with the WorldFish Center on the possibility of complementing their database with those of TD.

81. The representative from Thailand expressed the support of Thailand to the activities that focus on providing technical assistance for the promotion of fishing technologies and practices applicable for fishers in Thailand.

3.3 Other Programs

82. The Program Committee considered and endorsed the progress in the implementation of the following three programs in 2015 (**Annex 7**).

(1) Coastal Area Capability Enhancements in Southeast Asia (SEAFDEC/RIHN Collaborative Project)

83. The Program Committee noted the achievements of the project in 2015 and supported the conduct of the proposed activities in 2016.

(2) Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region (ACIAR supported Project)

84. The Program Committee noted the achievements of the project in 2015 and supported the conduct of the proposed activities in 2016.

(3) Technical Exchange between Thailand and Myanmar Fisheries Scientists (FAO/BOBLME-SEAFDEC Collaborative Project)

85. The Program Committee noted the achievements of the project in 2015 and supported the conduct of the proposed activities in 2016. In addition, the Program Committee Member for Thailand assured the Meeting that the country would continue to support the technical exchange of expertise between Thailand and Myanmar under this project.

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

(1) Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (UNEP/GEF/SEAFDEC)

86. The Meeting noted the status of this project (**Annex 8**) which is expected to be endorsed by CEO of Global Environmental Facility (GEF) in November or December 2015, and that the necessary funds will be transferred to SEAFDEC not later than the end of 2015. The Program Committee agreed that once the UNEP/GEF/SEAFDEC Project is endorsed, the Project status would be changed from “Pipeline Project” to “On-going Project”. In addition, the representative from Thailand reiterated its original proposal to have Koh Chang in Trat Province as a demonstration site for *Refugia*.

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

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

88. On behalf of the Network of Aquaculture Centres in Asia-Pacific (NACA), the representative from SEAFDEC Secretariat read the statement of the Director General of NACA, *Dr. Cherdsak Virapat* on the collaborative efforts between SEAFDEC and NACA. Firstly, the Program Committee was informed that the development objectives of NACA are: to increase production of fish for human consumption by means of sustainable aquaculture practices; improve rural income and employment; diversify rural farm production; and enhance foreign exchange earnings and savings through coordinated action programmes implemented through a network of regional and national centres associated institutions and bodies. NACA implements its mission by means of capacity building through education and training; collaborative research and development; development of information systems and communication networks; policy guidelines and support to policies and institutional capacities; aquatic animal health and disease management; gender, genetics, biodiversity and governance. NACA will seek collaboration with SEAFDEC in pursuing these activities in the near future: NACA Regional Lead Centre in the Philippines; capacity building programme in Aquaculture Governance; the 11th Asian Fisheries and Aquaculture Forum; and Celebration of the Silver Jubilee of NACA. Finally, he expressed the hope that NACA and SEAFDEC will find opportunities to strengthen collaboration and coordination, especially on important activities related to aquaculture development in the future. His statement appears as **Annex 9**.

VI. OTHER PROGRAM MANAGEMENT MATTERS

6.1 Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards

89. With regard to the information on the Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards (**Annex 10**), the Program Committee Member for Viet Nam sought clarification on each evaluation criteria with corresponding scores from 0 to 5, and suggested that each project should be evaluated using quantitative and qualitative indicators in which cross-cutting issues could be also accommodated in such evaluation. While also sharing the same view with Viet Nam, the Program Committee Member for Thailand suggested that key performance indicators (KPIs) could also be considered for the individual project evaluation. Along with such proposal, the Program Committee Member for Viet Nam cited that this is a good way to follow and improve the formulation and implementation of SEAFDEC programs and projects. However, considering the difficulties in formulating

KPIs for several regional small projects that comprise different nature of activities, SEAFDEC was asked to explore the best solution which is appropriate to the evaluation form.

90. The representative from Japan pointed out that the format of the evaluation would provide a good approach to be able to assess the achievements of a project each year against the expected outputs/outcomes at in a year.

91. In response to the query on the significance of the number of invested manpower indicated in the evaluation form, it was clarified that SEAFDEC would continue to compile such data and use this as basis for the cost-benefit analysis of each SEAFDEC project.

92. After thorough discussion, the Meeting suggested that SEAFDEC should consider improving the evaluation form taking into account the recommendations made by the Program Committee at this Meeting.

6.2 Review of the Implementation of the 2011 ASEAN-SEAFDEC Resolution and Plan of Action

93. The Program Committee took note of the review conducted by the SEAFDEC Secretariat of the Implementation of the 2011 ASEAN-SEAFDEC Resolution and Plan of Action by the AMSs (**Annex 11**). It was clarified that the report on the project implementation by the AMSs in conjunction with the 2011 Resolution and Plan of Action would be addressed during the SEAFDEC Council Meeting and ASWGFi for consideration. Considering that so far six countries have submitted inputs for the review, the remaining four countries were therefore requested to submit their respective inputs to the Secretariat by the end of this year. For the countries that have already submitted the information, these could also be updated if necessary.

94. On the query of the Program Committee Member for Viet Nam regarding the information that should be filled up in the questionnaire to precisely represent the outputs/outcomes since some activities/works are routinely implemented, it was clarified that outstanding activities or successful cases could be highlighted and reported to the Secretariat.

95. While expressing the appreciation to SEAFDEC for the efforts made in reviewing the implementation of the 2011 Resolution and Plan of Action as it is a good approach in assessing the current situation of fisheries in the region, the Program Committee Member for Brunei Darussalam expressed the view that the status of 5-year period implementation of the 2011 ASEAN-SEAFDEC Resolution and Plan of Action in the respective countries, would assist SEAFDEC and its Departments to extend technical assistance to MCs where appropriate.

6.3 High-Level Consultation on Regional Cooperation in Sustainable Fisheries Development Towards The ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products

96. The Meeting took note of the workplan for preparation of the High-Level Consultation on Regional Cooperation in Sustainable Fisheries Development towards the ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products (**Annex 12**), which is scheduled to be organized on 3 August 2016 in Bangkok, Thailand.

97. While noting the plan for preparation of the draft Joint Declaration as proposed by the Secretariat, the Program Committee Members for Malaysia, Philippines and Cambodia shared the view that the issues related to combating IUU fishing and enhancing the competitiveness of ASEAN fish and fishery products involve a wide range of stakeholders, and requested SEAFDEC to consider involving other agencies, *e.g.* Ministry of Labor and Transport, in the Preparatory RTCs that would be organized to develop the draft Joint Declaration. The representative from Japan expressed the difficulties in developing Joint Declaration that may include matters beyond the fisheries related authorities given a short period of time. Nevertheless, the Meeting agreed that the RTCs should involve only the agencies responsible for fisheries but once the draft Joint Declaration is developed and circulated to the Member Countries, internal consultations could be conducted with relevant national agencies to obtain views on the draft, and provide

the comments to SEAFDEC to be accommodated in the final draft for endorsement by the High-level Consultation.

98. With regards to the issue on labor, migratory workforce and working condition of fishers, the Program Committee noted that these issues were included in response to the recommendations of the SEAFDEC Council at its 47th Meeting in 2015 as this is very important for enhancing the competitiveness of the ASEAN fish and fishery products.

99. The Meeting recalled that the Concept Proposal for the High-level Consultation was supported by the 47th Meeting of the SEAFDEC Council, where it was agreed that the SOM level officials from the agencies responsible for fisheries of the ASEAN-SEAFDEC Member Countries should participate in the Consultation. Nevertheless, whether SOM level officials of each country would be chosen to participate in the High Level Consultation and from which agencies the officials come from is under the discretion of the respective countries.

100. On the establishment of the Drafting Committee for preparing the draft Joint Declaration, it was also suggested that SEAFDEC should request each country to nominate the appropriate person of relevant position or the National Coordinator to serve as member of the Drafting Committee and to undertake the task of collaborating with SEAFDEC Secretariat and Departments. In this connection, it was suggested that the Drafting Committee members should attend the Stakeholders' Consultations as well as the Drafting Committee Meetings to gather the necessary information that would go into the draft Joint Declaration for consideration by the SEAFDEC Council.

101. The Program Committee also expressed the concern on the time and protocol required by each country in obtaining approval of the draft Joint Declaration as well as the process of assuring the participation of SOM to the High-level Consultation, which could take some time for each country to consider. Nevertheless, as the agenda on High-level Consultation would be discussed again at the 18th FCG/ASSP Meeting to be held back-to-back after this Program Committee Meeting, the Program Committee agreed that this matter should be referred for discussion at the FCG/ASSP Meeting.

6.4 Issues on FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication

102. The Program Committee took note of the progress on the development of zero draft Regional Plan of Action for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (RPOA-SSF) at the South East Asia Regional Consultation on the Implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (FAO SSF Guidelines) conducted in Bali, Indonesia on 24-27 August 2015 (**Annex 13**), and provided their comments for the future direction that should be undertaken in assisting the Member Countries in the implementation of FAO SSF Guidelines.

103. The representative from Japan shared the view on the reason why the FAO SSF Guidelines is on a voluntary basis, because such Guidelines involve many aspects that are beyond fisheries-related authorities, like human rights, labor issues, gender equality, protection of minority, and therefore suggested developing voluntary regional guidelines.

104. The Program Committee noted that there are two approaches that the region could consider in implementing the FAO SSF Guidelines, *i.e.* continue developing the RPOA-SSF or developing of regional guidelines for SSF as already decided at the 47th Meeting of the SEAFDEC Council. For the option on development of the RPOA-SSF, this could be directly translated into action plans for implementation by the respective countries; while for the development of regional guidelines for SSF, the RPOA-SSF and action plans would need to be further developed to facilitate implementation by the Member Countries. After the discussion, the Program Committee agreed on the development of the draft Regional Guidelines taking into consideration the priorities and specificity of the AMSs.

105. The Program Committee agreed that the matter on development of Regional Guidelines for SSF would be presented for consideration during the 18th Meeting of ASEAN-SEAFDEC Strategic Partnership of the Fisheries Consultative Group (FCG).

6.5 SEASOFIA

106. The Program Committee took note of the draft outline and workplan for the preparation of the Southeast Asian Status of Fisheries and Aquaculture (SEASOFIA) as shown in **Annex 14**.

107. While commending SEAFDEC for its effort in producing the SEASOFIA, the Program Committee Member for Indonesia was of the view that the frequency of publishing the SEASOFIA every five years might be quite long and considering the timeliness of the information, SEAFDEC was asked to consider printing the SEASOFIA with shorter time interval than the every 5 years. However, it was clarified that the SEAFDEC Council agreed to publish the SEASOFIA every five years considering that there may be not much emerging issues in the region within few years period. The Meeting was also informed that SEAFDEC publishes the annual Fishery Statistical Bulletin of Southeast Asia which includes short synthesis of the status of fisheries in the region based on the statistics data provided by the countries.

108. On the inputs that would go into the SEASOFIA, the Chief of AQD informed the Meeting that AQD could provide information on the trend based on scientific literature but could be limited to what is available in literatures and references. In this regard, the countries were asked to consider providing also the necessary information considering that many countries are conducting activities the results of which might not have been published. Therefore, the National Coordinators were requested to facilitate providing the necessary information to ensure that the inputs into the SEASOFIA reflect the real picture of fisheries and aquaculture in the region.

VII. CONCLUSIONS AND RECOMMENDATIONS OF THE THIRTY-EIGHTH MEETING OF THE PROGRAM COMMITTEE

7.1 Adoption of Report of the Meeting

109. The Program Committee adopted the recommendations of its Thirty-eighth Meeting on 23-25 November 2015. The Program Committee also took note that the Report would be submitted to the 48th Meeting of SEAFDEC Council and to ASEAN through the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).

7.2 Date and Venue of the Thirty-ninth Meeting of the Program Committee

110. In considering the date and venue of the Thirty-ninth Meeting of the Program Committee, the Chief of SEAFDEC Inland Fisheries Resource Development and Management Department (IFRDMD), *Mr. Budi Iskandar Prisantoso* informed the Program Committee that IFRDMD would host the Thirty-ninth Meeting in Indonesia.

VIII. CLOSING OF THE MEETING

111. In his Closing Remarks, the Chairperson of the Program Committee thanked the Program Committee Members, representatives of the organizations, SEAFDEC Secretariat and Departments, for their valuable inputs and recommendations on the projects and activities of SEAFDEC. He cited that the recommendations from this Meeting would be submitted to the 18th FCG/ASSP Meeting to be convened back-to-back with this Meeting. He also thanked the SEAFDEC Aquaculture Department for hosting the Meeting in this beautiful city of Makati and the Meeting secretariat for their efforts in making the Meeting a success. He then declared the Meeting closed. His closing address appears as **Annex 15**.

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OPENING REMARKS

By Mr. Hajime Kawamura
Acting SEAFDEC Secretary-General

Distinguished Members of the SEAFDEC Program Committee,
SEAFDEC Department Chiefs and Senior Officials,
Representatives from our Collaborating Partners,
Ladies and Gentlemen,

Good morning and welcome to the Thirty-eighth Meeting of SEAFDEC Program Committee in this beautiful City of Manila. Before we start this Meeting, I would like to thank the Aquaculture Department for hosting this year's Meeting and for making the necessary arrangements to make our stay in this City comfortable and memorable.

Ladies and Gentlemen, you must be already aware that as with the previous Program Committee Meetings, we will start our discussion with the Programs under the FCG/ASSP Mechanism followed by Departmental Programs and Other Programs, and Pipeline Projects. You must have also noted that the Programs under the FCG/ASSP Mechanism have been grouped according to the Program Thrusts of the SEAFDEC Program Framework adopted by the SEAFDEC Council in 2009. As you can see from the Agenda of this Meeting, we have more than 30 projects to examine during our three-day meeting, a very hectic schedule indeed for all of us.

Nevertheless, during our review of the results of the programs implemented in 2015 as well as the proposed programs of activity for 2016, we should take into consideration the 2011 Resolution and Plan of Action, the needs of the Member Countries, and the policy directives given by the SEAFDEC Council. Specifically for the members of the Program Committee, we would like to request you to examine closely the programs of SEAFDEC and if there is probable cause, to criticize the direction and objectives of the proposed programs of activity, as stipulated in the Terms of Reference of the SEAFDEC Program Committee. To our collaborating partners, we would also welcome your advice, ideas, insights, and suggestions for the improvement of our programs. Your inputs during this Meeting would be essential to make sure that our programs are suitable enough to address the requirements of the region.

Ladies and Gentlemen, you must be also aware that SEAFDEC is already at the threshold of its Golden Anniversary in 2017. Various issues and concerns relevant to such celebration as well as to the management of SEAFDEC would have to be addressed at this Meeting. However, these aspects would be discussed during the closed session on the last day of our Meeting.

All in all, the outputs of this Meeting together with 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 ASWGF_i as appropriate through the Eighteenth Meeting of the FCG/ASSP to be held back-to-back with this Meeting.

We are therefore asking for your utmost cooperation and active participation in the discussions. We want to make sure that we could come up with recommendations that would pave the way towards the sustainable development of fisheries in our region and enhance the role of fisheries in the unified ASEAN Economic Community which is already in the offing.

With that note, Ladies and Gentlemen, I now declare the Thirty-eighth 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 2015 and Proposed Programs for the Year 2016

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 Resource Development for Sustainable Fisheries
- Optimizing Energy Use/Improving Safety Onboard in Fishing Activities
- Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia
- 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

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

- Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI GCP/RAS/269/GFF)
- 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

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

- Fisheries Resource Survey & 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 for Capacity Building in the Region to Address International Fish 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

3.1.7 New Projects Starting from 2015

- Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (ASEAN-SEC/IDB/ SEAFDEC)
- USAID Oceans and Fisheries Partnership

3.2 Departmental Programs

3.2.1 Aquaculture Department

- Quality Seed for Sustainable Aquaculture
- Healthy and Wholesome Aquaculture
- Maintaining Environmental Integrity through Responsible Aquaculture
- Adapting to Climate Change
- Meeting Social and Economic Challenges in Aquaculture

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

- Coastal Area Capability Enhancements in Southeast Asia (SEAFDEC/RIHN Collaborative Project)
- Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region (ACIAR supported Project)
- Technical Exchange between Thailand and Myanmar Fisheries Scientists (FAO/BOBLME-SEAFDEC Collaborative Project)

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

- Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (UNEP/GEF/SEAFDEC)¹

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

¹ At GEF approved Project Preparation Grants in 2013-2014 for developing a full 5-year proposal to be approved by GEF in 2014

Agenda 6: Other Program Management Matters

- 6.1 Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards
- 6.2 Reviews the Implementation of the 2011 ASEAN-SEAFDEC Resolution and Plan of Action
- 6.3 High-Level Consultation on Regional Cooperation in Sustainable Fisheries Development Towards The ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products
- 6.4 Issues on FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication
- 6.5 SEASOFIA

Agenda 7: Conclusions and Recommendations of the Thirty-eighth Meeting of the Program Committee

- 7.1 Adoption of Report of the Meeting
- 7.2 Date and Venue of the Thirty-ninth Meeting of the Program Committee

Agenda 8: Closing of the Meeting

**PROGRAMS UNDER THE FISHERIES CONSULTATIVE GROUP
OF THE ASEAN-SEAFDEC STRATEGIC PARTNERSHIP (FCG/ASSP) MECHANISM
FOR THE YEAR 2015-2016**

I. Existing Programs

Program Thrust/Project Title	Lead Department	2015	2016	Appendix No.
Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation & Food Security				
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
Thrust II: Enhancing Capacity & Competitiveness to Facilitate International and Intra-regional Trade				
Chemical and Drug Residues in Fish and Fish Products in Southeast Asia - Biotoxin (ASP, AZA and BTX) and Harmful Algal Blooms (HABs) in the ASEAN region	MFRD	Y	Y	7
Cold Chain Management for Seafood	MFRD	Y	Y	8
Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region	AQD	Y	Y	9
Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries				
Strategies for Trawl Fisheries By-catch Management (FAO-GEF/REBYC-II CTI)	TD	Y	N	10
Promotion of Counter Measures to Reduce IUU fishing activities	TD/ MFRDMD	Y	Y	11
Combating IUU Fishing in the Southeast Asian Region through Application of EU Catch Certification for Trading of Fish and Fishery Products	MFRDMD	Y	Y	12
Thrust IV: Providing Policy & Advisory Services for Planning & Executing Management of Fisheries				
Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2	TD	Y	Y	13
Offshore Fisheries Resources Exploration in Southeast Asia	TD	Y	Y	14
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	15
Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD	Y	Y	16
Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD	Y	Y	17
Thrust V: Addressing International Fisheries Related Issues from a Regional Perspective				
Assistance of Capacity Building in the Region to Address International Trade-related Issues	SEC	Y	Y	18
Strengthening SEAFDEC Network for Sustainable Fisheries	SEC	Y	Y	19

II. Special Project

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	20

Y = Program implemented during the year
 N = Program not implemented during the year

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

	Project id: 2013010101		
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Human Resource Development for Sustainable Fisheries		
Program Thrust:	I	Total Duration:	2013 - 2017
Lead Department:	TD	Lead Country:	All AMSs
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 197,390
Project Partner:		Budget for 2016:	USD 42,350
Project leader:	Dr. Yuttana Theparoonrat	Involved Country	Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

For the year 2016, SEAFDEC TD proposes to continue the HRD program to support and strengthen capability of fishery officers in promoting the sustainable fisheries management through the regional training courses on the fisheries extension service for sustainable fisheries development. The regional training course will focus on the fisheries extension methods, skills, and service to support the well being of people in the fisheries community. The regional training course will be conducted by using the training toolkits which will be useful for the target participants to make use of it in order to transfer their knowledge to their countries after completion of the training course.

2. Background and Justification

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 emphasises; 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; SEAFDEC TD is taking this challenge and will develop a training course curriculum and training toolkit on fisheries extension service for sustainable fisheries development which aims that participants understand and be skilled on the fisheries extension plan and service to effectively support the sustainable fisheries development which taking into account of both human and environmental well being as well as the participants need to be able to transfer and apply the gained knowledge to their fisheries management in their countries.

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

3.1 Objectives, Outcomes and Outputs of the Project

Objective	Outcomes	Outputs	Activities
1. Strengthening of fisheries officers in the MCs on the fisheries extension service for sustainable fisheries development	Strengthened and developed of human capacity in fisheries extension service for sustainable fisheries development for MCs	1. Results in comparison of the pre-post evaluation of the trainees 2. Number of trained and skilled in fisheries extension service for sustainable fisheries development of fisheries officers in MCs through the use of training toolkit	1. Conducting of the Regional Training Course 2. Develop the training course curriculum and toolkit on the fisheries extension service for sustainable fisheries development

Objective	Outcomes	Outputs	Activities
2. Strengthening awareness of the resource users of MCs on the importance of fisheries resource management for the sustainable fisheries through the use of promotion materials	Raising awareness of the resource users on the importance of fisheries resource management for the sustainable fisheries	Publication of the promotion materials on importance of fisheries resource management for the sustainable fisheries	Produce the promotion materials; posters, cartoon booklets, VCD and etc.

3.2 Overall Scope/Description of Project

Activity	Description
1. Conduct the Regional Training Course on Fisheries Extension Service for Sustainable Fisheries Development	Conduct of the regional training course on fisheries extension service for sustainable fisheries development. The course will be about one week period. Two participants from each of MC will be invited to participate in this training course.
2. Development of the training curriculum and toolkit	Three write shops will be carried out to develop the training course curriculum and the training toolkit. Each writeshop will take period about 3-4 days. Several resource persons who are specialized on the fisheries extension service and methods will be invited for the writeshops.
3. Production of the promotion materials on the importance of fisheries resource management for the sustainable fisheries.	Production of promotional materials such as poster, cartoon booklets, VCD and <i>etc.</i> in related to the importance of fisheries resource management for the sustainable fisheries will be made and disseminated to the SEAFDEC Member Countries and others target audiences.

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

(Unit: USD)

	Proposed Budget				
	2013	2014	2015	2016	2017
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					
- 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	-	

	Proposed Budget				
	2013	2014	2015	2016	2017
6. Conduction of the Regional Training Course on Fisheries Extension Service for Sustainable Fisheries Development				31,350	
7. Development of the training course curriculum and training toolkit				10,000	
8. Production of promotional materials	2,000	2,000	2,000	1,000	
	65,000	38,340	51,700	42,350	

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year 2015

- Developed the training course curriculum, training session plan and training toolkit on the fisheries extension methodologies
- The regional training course on E-EAFM and Fisheries Extension Methodologies was held from 6 to 16 October, 2015

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	
Development of training toolkit on fisheries extension methodologies	I		6	2	14,700
Conduction of the Regional Training Course on Essential EAFM and Extension Methodologies	T	21	8	-	35,000

3. Achievements and Expected Outcomes/Outputs of the Activity

Planned activity	Expected outcomes/outputs	Achievements
Development of training toolkit on fisheries extension methodologies	A set of training toolkit on E-EAFM and Fisheries Extension Methodologies for the SEA region	Developed the training course curriculum, training session plan, PowerPoint presentation and toolkit on the fisheries extension methodologies and be ready for the course conduction in October, 2015
Regional Training Course on Essential EAFM and Extension Methodologies	Strengthen of the knowledge/understanding of the trained fisheries officers in MCs on E-EAFM and equip their skill on the extension methods	Will be conducted from 6 to 16 October, 2015

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
The training course curriculum, training session plan, PowerPoint presentation and toolkit on the fisheries extension methodologies	Hard copies and e-files	

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

Planned activity	Evaluation/ Views from Participants
The regional training course on E-EAFM and Fisheries Extension Methodologies	The training course will be conducted from 6 to 16 October, 2015 (So, no result from the evaluation yet)

6. Major Impacts/Issues

None

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
1. Conduct the Regional Training Course on Fisheries Extension Service for Sustainable Fisheries Development	Conduct of the regional training course on fisheries extension service for sustainable fisheries development. The course will be about one week period. Two participants from each of MC will be invited to participate in this training course.	31,350
2. Development of the training curriculum and toolkit	Three write shops will be carried out to produce the training course curriculum and the training toolkit. Each write shop will take period about 3-4 days. Several resource persons who are specialized on the fisheries extension service and methods will be invited for the write shops.	10,000
3. Production of the promotion materials on the importance of fisheries resource management for the sustainable fisheries	Production of promotional materials such as poster, cartoon booklets, VCD and etc. in related to the importance of fisheries resource management for the sustainable fisheries and disseminated to the SEAFDEC Member Countries and others target audiences.	1,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Conduct the Regional Training Course on Fisheries Extension Service for Sustainable Fisheries Development	Strengthen of the knowledge/understanding of the trained fisheries officers in MCs on fisheries extension service for sustainable fisheries development and equip them with the necessary extension skill, expected that the participants will be able to apply their knowledge and experience to their work and make benefit to their countries.
Development of the training curriculum and toolkit	A set of training course curriculum and the toolkit on Fisheries Extension Service will be developed and make use in the MCs
Produce the promotion materials; posters, cartoon booklets, VCD and etc.	Raising awareness of the resource users on the importance of fisheries resource management for the sustainable fisheries

3. Schedule of Activity for the year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Conduct of the Regional Training Course on Fisheries Extension Service for Sustainable Fisheries Development							x					

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Produce of the training curriculum and toolkit		x	x	x	x	x						
Produce of the promotion materials; posters, cartoon booklets, VCD and etc.	x	x	x	x	x	x	x	x	x	x	x	x

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2013010102
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Optimizing Energy Use/ Improving Safety Onboard in Fishing Activities		
Program Thrust:	I	Total Duration:	2013 - 2017
Lead Department:	TD	Lead Country:	Thailand
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 207,000
Project Partner:		Budget for 2016:	USD 30,000
Project leader:	Fisheries Engineering Section of TD/CFTD (Mr. Suthipong Thanasansakorn	Involved Country	

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

In the Southeast Asian countries, the major concerns on the use of energy include; over-power of the main engine, heavy-wooden construction in hull structure, low maintenance of the engine and equipment, and inappropriate fishing operations/practices. This project deals with fuel efficiency measures that require minimum modification of their existing equipment to optimize energy using for fishing operation. Therefore, the main activities under the project would include transferring appropriate ways to optimize the use of energy for the fishing vessels and also adjustment/ improvement of current practices of the vessels.

In the capturing process, the fuel cost takes up majority of operational cost. But we cannot find any alternative source of energy in near future. 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 improve safety at sea for fishing vessels.

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 Objectives, Outcomes and Outputs of the Project

Objectives	Outcomes	Outputs	Activities
Objective 1:	Outcome 1: Enhancement of knowledge and experience of ship owners, fisheries extension officer, and other key stakeholders of ASEAN Member States	Output 1: Report of the training organized in ASEAN Member States	Activity 1: Regional and national training on optimizing energy and safety at sea for fishing vessels
Objective 2:	Outcome 2: Enhancement of the key stakeholders on international, regional, and national references for improvement of optimizing energy use and safety at sea for fishing vessels of ASEAN Member States	Output 2: Dissemination of the international guidelines on optimizing energy and safety at sea to the key stakeholders (national language of ASEAN Member States)	Activity 2: Information dissemination

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Regional and national training/workshop on optimizing energy and safety at sea for fishing vessels	A series of activities to promote the optimization of energy use and safety at sea for fishing vessels has been carried out. The project organized the regional training workshops, in collaboration with FAO and other technical agencies, on optimizing energy use and safety at sea for small fishing vessels since 2011 to compile existing international documents (guidelines, handbooks, handouts, etc.) on optimizing energy and safety at sea. Subsequently, the project translated international guideline, national guidelines, and other relevant training materials to the national languages. Such training materials have been used for onsite training program to enhance awareness of fishers and fisheries officials (to further transfer the knowledge) for fuel efficiency and safety at sea for the fishing vessels.
Activity 2 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 2013-2017)

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1:	Sub-activity 1.1	31,000	30,000	31,000	25,000	26,000
	Sub-activity 1.2	0	30,000	0	0	0
Activity 2:		5,000	5,000	5,000	5,000	4,000
	Sub-Total	36,000	75,000	36,000	30,000	30,000

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Project continued 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.

Preliminary Results of the Cruise Survey by M.V. SEAFDEC 2 Cruise No. 47-3/2014 and Cruise No. 48-1/2015 presented Oceanographic parameter, fish sampling for genetic research, result of fishing operation, FADs and hydroacoustic survey. The Cruise reports were published and disseminated to the participating countries and others.

Project supported human resource development on the tuna stock assessment in Sulu and Sulawesi Seas based on historical data and landing data collection. Accepted stock assessment models of relevant RFMO *e.g.* WCPFC and IOTC were disseminated through the tuna stock study of invited resource person. Project also provided platform and maintained the mechanism for sharing data and support information sharing of the research survey in offshore areas of the Member Countries.

Project supported technical staff(s) of TD to participate the cruise survey in Sulu and Sulawesi Seas based on the survey planning and arrangement of the cruise in their respective countries.

Reports of the meetings organized under the joint research on tuna stock assessment in Sulu and Sulawesi Seas, were published and disseminated to the participating countries and others.

Principle and technology of fish handling at sea onboard fishing vessels was disseminated through the regional training course on fish handling techniques applicable to various fishing operation in Southeast Asia. Training courses provided (i) knowledge and skill on environmental/user friendly fish handling tools and simples, (ii) promotion of food safety and minimizing post-harvest loss in catching, storing and transportation process, and (iii) ways forward to improve fish handling in assigned coastal and offshore fisheries cases in Southeast Asian 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					
Sub-activity 1.1 Training on Optimizing Energy and Safety at Sea for Small Fishing Vessels in Cambodia, 29 September to 1 October 2015	T	30	5		31,000 (Estimated)
Activity 2					
Sub-activity 2.1 Information dissemination	I	100			5000 (Estimated)

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
<u>Sub-activity 1.1</u> Training on Optimizing Energy and Safety at Sea for Small Fishing Vessels in Cambodia, 29 September to 1 October 2015	<ol style="list-style-type: none"> Participants are able to transfer and utilize the knowledge and information on energy saving and safety at sea Threats, issues and way forward for the promotion of energy saving and safety at sea Network of stakeholders in coastal provinces 	On-site training program on optimizing energy and safety at sea for small fishing vessels was organized from 29 September to 1 October 2015 in Prek Sihanoukville, Cambodia. The training program was carried out by resource persons from Marine Engineering Section of SEAFDEC/TD and invited experts from FRA/Japan.
Activity 2		
<u>Sub-activity 2.1</u> Information dissemination	Sets of training materials were disseminated to target participants of the training. They are fisheries managers of the coastal provinces in their countries, fisheries officials from local and central offices, ship building owners, fisheries extension officers, and other key stakeholders	There are one Hundred (100) translated optimizing energy and safety at sea for small fishing vessels guidelines copies published by SEAFDEC/TD. Sixty (60) set have been disseminated during the onsite training in Cambodia. The remain copies can support to the national program of Cambodia in related training of optimizing energy and safety at sea for small fishing vessels.

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1. FAO guidelines on safety at sea for fishing vessels (translated into Cambodia languages)	Hard copies	
2. FRA guidelines on optimizing energy and safety at sea for fishing vessels	Hard copies	

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

Planned activity	Evaluation/Views from Participants
Activity 1 Regional and national training on optimizing energy and safety at sea for fishing vessels	
<u>Sub-activity 1.1</u> Training on Optimizing Energy and Safety at Sea for Small Fishing Vessels in Cambodia, 29 September to 1 October 2015	Results from the questionnaire and discussion with the participants of the trainings were satisfactory. Participants commented to the training course that the knowledge was comprehensive and well applicable. Lectures and practices were useful for the participants in the practical way. Resource persons were well providing information in related subject. Participants rated the topic of applicable methods and techniques on energy saving for small fishing vessels, handling and maintenance of small marine engine and its effects on energy saving in fishing vessels and measures and initiatives related to safety at sea for small fishing vessels in Japan is very useful for them. There were some minor improvement that should be considered, <i>i.e.</i> training should conduct during dry season so that activities can be followed the plan, strengthened the participatory approach to make sure that participants are much easier to follow the lecturer and training course should be

Planned activity	Evaluation/Views from Participants
	<p>separated into two training courses, one is saving energy, and the other one is safety at sea. Organizer can conduct back to back training aiming at having good concentration of the participants.</p> <p>To ensure the continuation of the products (in terms of knowledge transfer for further application at the various level of users), SEAFDEC should have a follow-up activity to monitor the national program related to the issues.</p>
Activity 2 Information dissemination	
<u>Sub-activity 2.1</u> Information dissemination	Participants commented that the handbooks were well applicable and easy to understand. That will be used for following-up activities and to monitor the national program related to the issues.

6. Major Impacts/Issues

There is a need to follow-up with the countries where the training conducted. This aims to see the effectiveness of the project/activity implementation. In addition, future program of the activities related to “optimizing energy” should consider how best SEAFDEC could contribute the “reduction of carbon emission” through optimizing energy for the fishing vessels, in particularly for the small fishing vessels which occupied majority of number of the vessels in the region.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1	Regional and national training on optimizing energy and safety at sea for fishing vessels	25,000
<u>Sub-activity 1.1</u>	Training on Optimizing Energy and Safety at Sea for Small Fishing Vessels	(25,000)
Activity 2	Information dissemination	5,000
<u>Sub-activity 2.1</u>	<p>Compilation and revision of the technical handbook and guideline on sampling gears and survey methodology for optimizing energy and safety at sea to the key stakeholders (national language) will be continued</p> <p>Dissemination of the international guidelines on optimizing energy and safety at sea to the key stakeholders (national language)</p>	

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	Regional and national training on optimizing energy and safety at sea for fishing vessels
<u>Sub-activity 1.1</u>	Supporting ASEAN efforts to promote low carbon emission to the environment by minimizing the contribution of fisheries sector to green-house gas emission, which emphasize on promoting energy efficiency. In addition, the working conditions of fishers’ onboard fishing vessels are considered poor, it is therefore necessary to strengthen measures for safety of fishing vessels by taking into account regional/national specificity.
Activity 2	Information dissemination
<u>Sub-activity 2.1</u>	Revision of the current handbook and promotional materials

3. Schedule of Activity for the Year 2016

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

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2013010103
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia		
Program Thrust:	I	Total Duration:	2015 - 2019
Lead Department:	TD	Lead Country:	Thailand
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 292,760
Project Partner:	None	Budget for 2016:	USD 48,560
Project leader:	CSFDH/TD	Involved Country:	SEAFDEC Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

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

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

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices	Under this activity, the 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

Activity	Description
	<p>pelagic species, will be conducted. Information collection would be conducted through deskwork and visit to the member countries. The results of the information gathering will be used for mapping and assessment by indices of the status of the critical fishing grounds in the region.</p> <p>This activity will also investigating the 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.</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 will be are conducted in selected pilot project site of member countries. The pilot site selection will be decide 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 sea grass beds for fisheries resources in member countries. The pilot site selection will be decide 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 carried 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:	Sub-activity 1.1	0	0	5,360	5,360	0
	Sub-activity 1.2	0	1,500	2,780	2,780	2,500
	Sub-activity 1.3	0	0	16,500	0	0
Activity 2:	Sub-activity 2.1	9,500	8,000	10,000	8,840	10,000
	Sub-activity 2.2	27,700	20,000	27,860	27,860	27,860
	Sub-activity 2.3	15,500	18,500	0	18,160	0
Activity 3	Sub-activity 3.1	1,000	560	1,000	500	2,000
	Sub-activity 3.2	0	0	0	0	21,140
Sub-Total Budget		53,700	48,560	63,500	63,500	63,500

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the present year

The Regional Inception Workshop under support by JTF-6 Program on the Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia was organized on 31 July 2015 in Pattaya, Thailand.

Workshop adopted the following general recommendations, and country-specific recommendations.

- 1) The expected outcomes of the Project should be determined in the plan to identify specific activities, output indicators, and the required data and information to be used for regular monitoring and determination of the success of the Project, and adjustment of the plan if and when necessary. Compilation of information and development of database that could be referred to by Member Countries;
- 2) The adopted country-specific recommendations include the way forward and support required by the countries in sustaining their activities on resources enhancement and rehabilitation.

The Seminar on Andaman province dog conch resources management measures was conducted in Krabi Province, Thailand.

The meeting was participated by 70 participants from stakeholder representative from 6 provinces in Andaman Sea, Department of Fisheries Officers, and SEAFDEC Training Department staffs. The meeting agreed to ban on harvesting of under-sized dog conch less than 6 cm in length. Only hand collecting of dog conch is allowed. Using dredges or trawl net, push net with or without motorized boat are prohibited. Diving by air supplied equipment or tanks to collect dog conch are prohibited. Dog conch conservation zone in seagrass beds area were proposed by all Andaman provinces. The permanent dog conch conservation areas were established by local fishing community in Sriboya island, Krabi province, and Muk island, Trang province. Conservation area in Sarai island, Satun province is under consideration by local fishing community for demarcation.

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					

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
<u>Sub-activity 1.2</u> : Information collection on suitable designs of resource enhancement practices including their evaluation and promotion					
<u>Sub-activity 1.3</u> : Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation	R	29	33	8	12,700
Activity 2: Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds					
<u>Sub-activity 2.1</u> : Technical assistance in a pilot site for suitable designs of resource enhancement practices					
<u>Sub-activity 2.2</u> : Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management	R	5	1	53	335
Activity 3: Promotion and extension on rehabilitation of fisheries resources and habitats/ fishing grounds in ASEAN Region					
<u>Sub-activity 3.1</u> : 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		
<u>Sub-activity 1.1</u> : Investigation/ review of the status of critical habitats/fishing grounds in the Southeast Asian region		
<u>Sub-activity 1.2</u> : Information collection on suitable designs of resource enhancement practices including their evaluation and promotion		
<u>Sub-activity 1.3</u> : Workshop/ Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation	Inputs of experiences and lesson-learned from member countries with fully contribute to identify critical habitats/fishing grounds and to find out the way to proper management and rehabilitation plans of fishing grounds and habitats in ASEAN Member Countries	The Regional Inception Workshop under support by JTF-6 Program on the Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia was organized on 31 July 2105 in Pattaya, Thailand
Activity 2: Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds		
<u>Sub-activity 2.1</u> : Technical assistance in a pilot site for suitable designs of resource		

Planned activity	Expected outcome/output	Achievements
enhancement practices		
<u>Sub-activity 2.2:</u> Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management	The permanent dog conch conservation areas were established by local fishing community in Sriboya island, Krabi province, and Muk island, Trang province. Conservation area in Sarai island, Satun province is under consideration by local fishing community for area demarcation.	The seminar on Andaman province dog conch resources management measures was conducted in Krabi Province, Thailand
<u>Sub-activity 2.3:</u> 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		
<u>Sub-activity 3.1:</u> Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness		
<u>Sub-activity 3.2:</u> End of project regional seminar		

4. List of Completed Publications and Others

List of completed publications for the year 2015	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 1:	
Sub-activity 1.1:	Compilation of information and development of database that could be referred to by Member Countries
Sub-activity 1.2:	Mapping of important critical fishing grounds and habitats and associated fish species should be conducted taking into consideration various sources of information, <i>e.g.</i> indigenous knowledge of fishers, scientific researches, etc.
Sub-activity 1.3:	
Activity 2:	Monitoring and evaluation of successes and failures of resources enhancement initiatives should be carried out based on intended objectives, <i>i.e.</i> whether for enhancing resources/stocks, attracting fish to increase production and incomes of fishers, protection from encroachment, etc.

6. Major Impacts/Issues

The rehabilitation of fisheries resources in sea grass-based site in Sriboya island, Krabi province, Thailand, is an initiated issue on mass dog conch shell conservation in 6 provinces on Andaman sea of Thailand. The follow-up activities such as promotion on awareness building on dog conch conservation area in each province, utilization of marketable size of dog conch and sustainable shell collection methodology are on-going. Additional supported activities from local government for sustainable dog conch shell resources rehabilitation and utilization are being implemented.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
Sub-activity 1.1		-
Sub-activity 1.2	Information collection on suitable designs of resource enhancement practices including their evaluation and promotion	1,500
Sub-activity 1.3		-
Activity 2		
Sub-activity 2.1	Technical assistance in a pilot site for suitable designs of resource enhancement practices	8,000
Sub-activity 2.2	Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management	20,000
Sub-activity 2.3	Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures	18,500
Activity 3		
Sub-activity 3.1	Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness	560
Sub-activity 3.2		-

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	<p>Mapping of important critical fishing grounds and habitats and associated fish species from various sources of information, <i>e.g.</i> indigenous knowledge of fishers, scientific researches, etc.</p> <p>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.</p>
Activity 2	<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 for fisheries resources 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>
Activity 3	Documentation of the best practices of the project implementation will be carried out.

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activity 1.1												
Sub-activity 1.2	X	X	X	X	X	X	X	X	X	X	X	X
Sub-activity 1.3												
Activity 2												
Sub-activity 2.1	X	X	X	X	X	X	X	X	X	X	X	X
Sub-activity 2.2	X	X	X	X	X	X	X	X	X	X	X	X
Sub-activity 2.3										X		
Activity 3												
Sub-activity 3.1							X	X	X	X	X	X
Sub-activity 3.2												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

Project id: 2015030102			
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources		
Program Thrust:	I	Total Duration:	2015 - 2019
Lead Department:	AQD	Lead Country:	Philippines
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 355,600
Project Partner:	None	Budget for 2016:	USD 65,400
Project leader:	Takuro Shibuno, AQD DC	Involved Country	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, Outcomes and Output of the Project

Objectives	Outcomes	Outputs	Activities
Objective 1: To establish environment-friendly, responsible aquaculture technology	Outcome 1: Use of plant-origin feed ingredients that are available in the region for cultured freshwater fish species such as tilapia. Promoting the aquasilviculture of shrimp as an ecosystem based	Output 1: Exploration of plant-origin feed ingredients that are available in the region for cultured freshwater fish species such as tilapia. Establishment of ecosystem-based pond management strategies for increased	Activity 1: Establishment of environment-friendly, responsible aquaculture technology - The replacement of fishmeal as the main source of protein in feeds that will further improve production traits of tilapia. - Test of refined formulated diets in cages and pond culture systems using improved feeding management scheme - Determination of; 1) the time

Objectives	Outcomes	Outputs	Activities
	management strategy	production in ASEAN member countries.	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.).
<p>Objective 2: To promote community-based production and resource enhancement of high-value aquatic resources to secure the livelihood with avoiding rampant, illegal fishing and social conflicts.</p>	<p>Outcome 2: Promotion for the community-based production and resource enhancement of high-value aquatic resources</p>	<p>Output 2: Improvement of organizational, management and entrepreneurial skills of fisherfolks to sustain livelihoods from production, sea ranching and stock enhancement high-value aquatic products.</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>Activity 2: Promote community-based production and resource enhancement of high-value aquatic resources</p> <ul style="list-style-type: none"> - 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. - Production of seeds 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.
<p>Objective 3: To extend and demonstrate aquaculture technologies to member countries.</p>	<p>Outcome 2: Extending the technologies to rural member countries to hasten economic development in the region.</p>	<p>Output 3: Extension of technologies to rural member countries to hasten economic development in the region.</p>	<p>Activity 3: Technology and information transfer on resource enhancement practice through training.</p> <ul style="list-style-type: none"> - Extension and demonstration for the breeding, hatchery seed production, nutrition and health management in grouper, seabass, snapper etc. through training program. - Special training focusing on the culture of important fisheries commodities such as giant freshwater prawn, cat fish, big head carp.

3.2 Overall Scope/Description of Project

Activity	Description
<p>Activity 1: Establishment of environment-friendly, responsible aquaculture technology</p>	<p><u>Sub-activity 1.1</u> Use of plant-based protein sources in tilapia feeds for improved production traits Use of plant-origin feed ingredients that are available in the region will be explored in the development and/or refinement of aquafeed for cultured freshwater fish species such as tilapia. Activities are geared toward the replacement of fishmeal as the main source of protein in feeds that will further improve production traits of tilapia.</p> <p><u>Sub-activity 1.2</u> Responsible aquaculture through aquasilviculture Aquasilviculture as an ecosystem-based pond management strategy will be investigated. Micro-organisms present in the mangrove forest has the ability to transform nutrients to bioavailable form that can be eaten by microorganisms lower in the food web which in turn can serve as food to organisms higher in the food web like the crabs. This process of transformation also improves water quality. The ability of mangroves to improve water quality is affected by the mangrove to pond area ratio (MPR). This study aims to establish the duration for a mangrove habitat to remove nutrients from shrimp pond including other factors that might affect its efficiency</p>
<p>Activity 2: Promotion of community-based production and resource enhancement of high-value aquatic resources</p>	<p><u>Sub-activity 2.1</u> Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement Sea cucumber or sandfish are detritus feeders in intertidal flats and reef areas that help aerate marine sediments and recycle nutrients necessary for maintaining marine ecosystems. Donkey ear abalones are gastropods that feed on encrusting algae and micro-particulates in coralline areas. Households in coastal and island communities earn income from selling these high-value export commodities. These species have become overexploited. Community-based integrated production of these species through culture, sea ranching and stock enhancement is proposed for low-income households who live in environments without electricity but with natural food for abalones and sea cucumbers. Thus, seeds will be produced in small-scale solar-powered hatchery. This project aims to maintain the health of the intertidal and reef environment through production systems that use hatchery-bred seeds produced from local broodstocks and grown with natural food while providing sustainable sources of income for coastal dwellers in remote island communities and improve governance of coastal resources in the Philippines and similar areas in Member Countries in Southeast Asia.</p> <p><u>Sub-activity 2.2</u> Promotion of resource enhancement of seahorses 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	Description
Activity 3: Technology extension and demonstration	<p><u>Sub-activity 3.1</u> Marine fish hatchery training program Aquaculture of high-value marine finfish species continues to develop rapidly in Southeast Asia. This training program will extend and demonstrate the breeding, hatchery seed production, nutrition and health management in grouper, seabass, snapper <i>etc.</i></p> <p><u>Sub-activity 3.2</u> Rural aquaculture program Training focusing on promotion of community-based freshwater aquaculture for remote rural areas of Southeast Asia will be organized by SEAFDEC/AQD under this sub-activity, which will promote capacity building for establishing appropriate aquaculture system applicable in remote rural area.</p>
Activity 4: Publication	Manuals, posters, pamphlets and flyers describing disease prevention methods will be published and distributed.
Activity 5: Annual progress meeting and international workshop	<p><u>Sub-activity 7.1</u> Annual progress meeting 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><u>Sub-activity 7.2</u> International workshop The workshop, not only receive participants from member countries, but also invite expert scientists as key note speakers to facilitate to spread and exchange brand-new information on fish health management between SEAFDEC and various institutions.</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 2015-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 1: Establishment of environment-friendly, responsible aquaculture technology	Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits	11,000	8,800	8,800	8,800	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	15,000	15,000
	Sub-activity 2.2: Promotion of resource enhancement of seahorses	11,000	8,800	8,800	8,800	8,800
Activity 3: Technology extension and demonstration	Sub-activity 3.1: Marine fish hatchery training program	8,000	7,500	7,500	7,500	7,500

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
	Sub-activity 3.2: Rural aquaculture program	9,000	8,500	8,500	8,500	8,500
Activity 4: Publication		0	0	0	0	5,000
Activity 5: Annual progress meeting and international workshop	Sub-activity 5.1: Annual progress meeting	5,000	4,000	4,000	4,000	4,000
	Sub-activity 5.2: International workshop	0	0	0	10,000	0
Activity 6	Coordination by Project Leader	4,000	4,000	4,000	4,000	4,000
	Sub-Total Budget	79,000	65,400	65,400	75,400	70,400

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

The envisaged outcomes for the first year are: 1) Evaluation on the nutritional value of selected locally available plant-origin feed ingredients and refinement of existing diet formulation on broodstock and grow-out stages of freshwater fish species; 2) Investigation on the culture of *P. monodon* with finfish inside pen in ponds with adjacent mangrove stocked with mudcrab; 3) Improving fisheries governance and strategies for managing enhanced abalone and sandfish stocks and health of its habitat; 4) Establish the appropriate transport and acclimation strategies of seahorses from the hatchery to the release site to ensure optimum conditions for the survival of animals; and 5) Technology and information transfer on resource enhancement practice through training.

2. Information of Present Year Activity including Involved Stakeholders

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 1 Establishment of environment-friendly, responsible aquaculture technology					
Sub-activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits					
Sub-activity 1.2 Responsible aquaculture through aquasilviculture					
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources					
Sub-activity 2.1 Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	R	Philippines, 50 : active BFARMC-fishers, LGU & trader-collaborators & abalone gleaners in project site	7		3,300

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
<u>Sub-activity 2.2</u> Promotion of resource enhancement of seahorses	T	Philippines, 50: Fisherfolk organization members/ students/ local community			150
Activity 3 Technology extension and demonstration					
<u>Sub-activity 3.1</u> Marine fish hatchery training program	T	11		1	8,000
<u>Sub-activity 3.2</u> Rural aquaculture program	T (conducted Nov. 24- Dec.3, 2015)	3		No applicant yet	9,000

3. Achievements and Expected Outcome/Output of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Establishment of environment-friendly, responsible aquaculture technology		
<u>Sub-activity 1.1</u> Use of plant-based protein sources in tilapia feeds for improved production traits	Evaluation on the nutritional value of selected locally available plant-origin feed ingredients and refinement of existing diet formulation on broodstock and grow-out stages of freshwater fish species	Evaluation on the nutritional value of selected unconventional plant-based feed ingredients were made prior to the refinement of existing diet formulations for cultured freshwater fish species. Trials will be made to assess the effect of refined formulated diets on the growth and reproductive performance, nutrient excretion and health condition of cultures species.
<u>Sub-activity 1.2</u> Responsible aquaculture through aquasilviculture	Determination of the effect of different mangrove to pond area ratio on the removal of nutrients from shrimp pond effluent.	Data on the duration for a mangrove habitat to remove nutrients from shrimp pond effluent.
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources		
<u>Sub-activity 2.1</u> Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	Improving fisheries governance and strategies for managing enhanced abalone and sandfish stocks and health of its habitat	(1) Construction of integrated solar-powered hatchery and conduct production runs; (2) Set-up sandfish nursery using hapa net cages in pens and abalone nursery using coralline substrates in intertidal flats and reefs; (3) Plant <i>Gracilaria</i> seaweeds for abalone feed in nursery and grow-out culture phase; and, (4) Stock abalone and sandfish in new sea ranching and stock enhancement sites using locally produced seeds.
<u>Sub-activity 2.2</u> Promotion of resource enhancement of seahorses	Establish the appropriate transport and acclimation strategies of seahorses from the hatchery to the release site (e.g. appropriate size of	(1) Develop appropriate transport and acclimation strategies of seahorses from the hatchery to the release site; (2) Determine the appropriate size of seahorses for release as well as the appropriate time of release;

Planned activity	Expected outcome/output	Achievements
	seahorses for release, appropriate time of release, etc.) to ensure optimum conditions for the survival of animals	(3) Develop appropriate monitoring strategies of the released seahorses; and (4) Involve the community in the management of the natural resources by disseminating information and participating in the protection and conservation of the coral and sea grass areas which are the natural habitat of seahorses.
Activity 3 Technology extension and demonstration		
<u>Sub-activity 3.1</u> Marine fish hatchery training program	Technology and information transfer on resource enhancement practice through training	Aquaculture of high-value marine finfish species continues to develop rapidly in Southeast Asia. This training program extended and demonstrated the breeding, hatchery seed production, nutrition and health management in grouper, seabass, snapper <i>etc.</i>
<u>Sub-activity 3.2</u> Rural aquaculture program	Technology and information transfer on resource enhancement practice through training	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.

4. List of Completed Publications and Others

List of completed publications for the year 2015	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	
<u>Sub-activity 1.1</u> Use of plant-based protein sources in tilapia feeds for improved production traits	
<u>Sub-activity 1.2</u> Responsible aquaculture through aquasilviculture	
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources	
<u>Sub-activity 2.1</u> Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	
<u>Sub-activity 2.2</u> Promotion of resource enhancement of seahorses	
Activity 3 Technology extension and demonstration	

<u>Sub-activity 3.1</u> Marine fish hatchery training program	Participants evaluated relevance of topics (4.75); technical knowledge learned (4.17); trainees confidence to do duties upon return (4.33); overall coordination of training activities (4.5), on a scale of one to five.
<u>Sub-activity 3.2</u> Rural aquaculture program	Not applicable at the moment. To be conducted Nov. 24- Dec. 3, 2015

6. Major Impacts/Issues

Activity 2.1 -The Sagay local government affirmed to adopt the initiative by funding the construction of a small-scale solar-powered hatchery to ensure seed supply in 2013. However, actual construction in 2015 is constrained by use rights for the parcel of land in the island. The role of governance and the need to enable fishers to access livelihood assets (e.g. land, capital, skills, etc.) is demonstrated and is a challenge in this applied social science research.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1. Establishment of environment-friendly, responsible aquaculture technology		
<u>Sub-activity 1.1</u> Use of plant-based protein sources in tilapia feeds for improved production traits	Trials will be conducted to compare growth and fry production of tilapia broodstock fed graded levels (0, 50 and 100%) of the identified crop residue in a 40% crude protein diet and reared for 21 weeks in lake-based cages and tanks.	8,800
<u>Sub-activity 1.2</u> Responsible aquaculture through aquasilviculture	Aquasilviculture as an ecosystem-based pond management strategy will be investigated. Micro-organisms present in the mangrove forest has the ability to transform nutrients to bioavailable form that can be eaten by microorganisms lower in the food web which in turn can serve as food to organisms higher in the food web like the crabs. This process of transformation also improves water quality. The ability of mangroves to improve water quality is affected by the mangrove to pond area ratio (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. Monitoring of nutrient levels and bacterial flora of environments receiving effluent from shrimp farms started in 2015 will be continued in 2016.	8,800
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources		
<u>Sub-activity 2.1</u> Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	Continue the tri-party stakeholder participation (3PSP) model for resource enhancement involving BFARMC, Sagay LGU and AQD-GOJ to: 1. operationalize the small-scale solar-powered abalone hatchery and sandfish nursery pens; 2. conduct periodic trial releases and monitoring of sandfish juveniles from broodstocks sourced in Sagay and bred in AQD-TMS hatchery, and 3. continue monthly monitoring of the abalone stock enhancement demo-site	15,000

Proposed Activity	Description of Proposed Activity	Proposed Budget
<u>Sub-activity 2.2</u> Promotion of resource enhancement of seahorses	Trials on the transport and acclimation strategies, and appropriate size and time of release started in 2015 and will be continued until middle of year 2016; Activities on monitoring strategies of the released seahorses will be conducted; and the involvement of the community in the management of the natural resources will be continuously conducted by hands-on training during monitoring of released seahorses.	8,800
Activity 3 Technology extension and demonstration		
<u>Sub-activity 3.1</u> Marine fish hatchery training program	Apply proper broodstock management and spawning techniques; Produce natural food organisms for fish larvae; Apply larval and nursery rearing techniques	7,500
Sub-activity 3.2 Rural aquaculture program	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.	8,500
Activity 4 Publication		
Activity 5 Annual progress meeting and international workshop		
<u>Sub-activity 5.1</u> 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
<u>Sub-activity 5.2</u> International workshop		0
Activity 6 Coordination by Project Leader	The project leader will coordinate and assist the research and dissemination, and also facilitate information exchange not only between activities but also among member countries so that environment-friendly resource enhancement will be effectively promoted in Southeast Asia. Semi-annual meeting will be held on July or August to confirm the progress of respective activities and sub-activities. Project achievements will be summarized at the end of year. Annual progress report will be prepared.	4,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1 Establishment of environment-friendly, responsible aquaculture technology	
<u>Sub-activity 1.1</u> Use of plant-based protein sources in tilapia feeds for improved production traits	Information on the suitability and optimum level of agricultural residue in diets for tilapia broodstock with improved growth and fry production
<u>Sub-activity 1.2</u> Responsible aquaculture through aquasilviculture	Data on the duration a mangrove habitat can efficiently remove nutrients from shrimp pond effluent in relation to the mangrove to pond area ratio (MPR) and other factors that might affect its efficiency.
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources	

Proposed Activity	Expected Outcomes/Outputs of Activity
<u>Sub-activity 2.1</u> Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	Sustained tri-party stakeholder participation (3PSP) for resource enhancement involving BFARMC, Sagay LGU and AQD-GOJ with the following achievements: 1) operational small-scale solar-powered abalone hatchery and sandfish nursery pens, 2) periodic trial releases of sandfish juveniles from broodstocks sourced in Sagay and bred in AQD-TMS hatchery, and 3) sustained productivity and healthy habitat of the abalone stock enhancement demo-site expected from monthly monitoring.
<u>Sub-activity 2.2</u> Promotion of resource enhancement of seahorses	Information on appropriate the transport and acclimation strategies for seahorses as well as information on appropriate size and time of release of seahorses to ensure survival of released animals during transport from the hatchery to the released site.
Activity 3 Technology extension and demonstration	
<u>Sub-activity 3.1</u> Marine fish hatchery training program	Enable participants to operate a fish hatchery by providing them with technical knowledge & skills on spawning and larval rearing of marine fishes: milkfish, sea bass, groupers, snappers, rabbitfish and silver pomfret
<u>Sub-activity 3.2</u> Rural aquaculture program	1. Capacitate aquaculture extension officers on community organizing through participatory approach; 2. Enhance their knowledge and skills on freshwater aquaculture technologies from bloodstock development to seed production, nursery and grow-out phase; 3. Enhance their skills in the transfer and extension services of freshwater aquaculture technologies.

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1 Establishment of environment-friendly, responsible aquaculture technology												
<u>Sub-activity 1.1</u> Use of plant-based protein sources in tilapia feeds for improved production traits												
<u>Sub-activity 1.2</u> Responsible aquaculture through aquasilviculture												
Activity 2 Promotion of community-based production and resource enhancement of high-value aquatic resources												
<u>Sub-activity 2.1</u> Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement												
<u>Sub-activity 2.2</u> Promotion of resource enhancement of seahorses												
Activity 3 Technology extension and demonstration												
<u>Sub-activity 3.1</u> Marine fish hatchery training program												
<u>Sub-activity 3.2</u> Rural aquaculture program												
Activity 4 Publication												

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 5 Annual progress meeting and international workshop												
<u>Sub-activity 5.1</u> Annual progress meeting												
<u>Sub-activity 5.2</u> International workshop												
Activity 6 Coordination by Project Leader												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2015050101
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia		
Program Thrust:	I	Total Duration:	2015 – 2019
Lead Department:	IFRDMD	Lead Country:	Indonesia
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 210,000
Project Partner:	None	Budget for 2016:	USD 42,000
Project leader:	Dr. Dina Muthmainnah	Involved Country	All 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 increases 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, Outcomes and Outputs of the Project

Objectives	Outcomes	Outputs	Activities
Objective 1: Having clear understanding on present status of resources, fisheries and utilization of catadromous eels in the region	Outcome 1: Understanding the present status on catadromous eel resources in the region. It would be a valuable source for consideration of the conservation measures on tropical eel in the latter half of this project.	Output 1: Grasping the present status of fisheries, commercial distribution and the trades of catadromous eel in the region.	Activity 1: Clear understanding on current situation of resources, fisheries and utilization Sharing and exchanging information on catadromous eels in the region among AMS through a workshop focusing on its fisheries. Collecting the information and data by surveying on eel fisheries for clear understanding on present status and intensity of eel fisheries including glass eel fishery. Finding out the present status of eel trade and market in AMS through interviewing the stakeholders on commercial distribution and trade on tropical eels.
Objective 2: Improving data collection and statistics of catadromous eel catch in AMS	Outcome 2: Improving the method of data collection on eel fisheries in the region, with mutual understanding of the differences and similarities on eel fisheries at each AMS.	Output 2: - Improving the species identification technique on genus <i>Anguilla</i> in the region. - Gathering continuous data on eel fisheries and trades in AMS with accuracy. - Finding out the appropriate methods/measures to collect statistics on eel fishery in the region.	Activity 2: Improvement of data collection and statistics on eel fisheries Conducting studies on species identification based on DNA technology, including the training of handling genetic information. Developing the methodologies of data collection for catch/trade statistics on eel in AMS. Having a workshop for the discussion how to develop data collection methodologies for eel statistics among AMS.
Objective 3: Enhancing knowledge and capacity of AMS for conservation, management and sustainable utilization of catadromous eel resources	Outcome 3: Promoting the appropriate management of eel fisheries for the sustainable use of tropical eel resources in the region.	Output 3: - Finding important causes and factors that wreak the negative impact on tropical eels then seeking the mitigating measures. - Constructing guidelines on eel	Activity 3: Promotion of conservation, management and sustainable utilization Conducting researches in several waters in the region regarding the negative impact of environmental changes on catadromous eel resources and seeking

Objectives	Outcomes	Outputs	Activities
		fishery in the region. - Disseminating the results from this project and also proposing guidelines/policy recommendation on eel fisheries among AMS.	measures for mitigation from the damages. 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. 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.

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Clear understanding on current situation of resources, fisheries and utilization	<ul style="list-style-type: none"> - 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 will be postponed into February 2016 considering the conveniences of the participants. (Sub-activity 1.1) - Collecting the information and data by surveying on eel fisheries in Indonesia, Philippines and Myanmar 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 2017. (Sub-activity 1.2) - 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 2017 in Indonesia, Philippine and Myanmar. (Sub-activity 1.3)
Activity 2 Improvement of data collection and statistics on eel fisheries	<ul style="list-style-type: none"> - Conducting studies on species identification among the genus <i>Anguilla</i> in Indonesia, Philippine and Myanmar, based on DNA technology. It includes the training of handling genetic information. This activity will be carried out during the years of 2015 to 2017. (Sub-activity 2.1) - Developing the 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) - Having a workshop for the discussion how to develop data collection methodologies for eel statistics among AMS, based on the data taken in 2015 and 2016. The workshop(s) will be held in 2018. (Sub-activity 2.3)
Activity 3 Promotion of conservation, management and sustainable utilization	<ul style="list-style-type: none"> - Conducting researches in several waters in the region, especially in Indonesia, Philippine, and Myanmar, regarding the negative impact of environmental changes on catadromous eel resources and seeking measures for mitigation from the damages. This activity will be carried out during the years of 2017 to 2019. (Sub-activity 3.1) - Compiling all the results 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) - Having a workshop for dissemination of the outcomes from this project and developing a policy recommendation on sustainable use of catadromous eel resources in the region at the end of the project (2019). (Sub-activity 3.3)

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 including glass eel catch	8,000	12,000	8,000		
	Sub-activity 1.3: Survey on commercial distribution/trade of catadromous eels including glass eel	8,000	9,000	8,000		
Activity 2: Improvement of data collection and statistics on eel fisheries	Sub-activity 2.1: Study on catadromous eel species identification by DNA technology	8,000	12,000	8,000		
	Sub-activity 2.2: Study on statistical data collection methodologies		9,000	8,000		
	Sub-activity 2.3: Workshop to develop statistical data collection methodologies				16,000	
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	10,000	8,000
	Sub-activity 3.2: Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources				16,000	
	Sub-activity 3.3: Workshop to develop policy recommendation on the sustainability of catadromous eel resources in the region					34,000
	Sub-Total Budget	42,000	42,000	42,000	42,000	42,000

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION**1. Achievements of the Project Implementation for the Present Year**

In 2015, IFRDMD with SEAFDEC Secretariat (hereinafter referred to as “SEC”) conducted the baseline study on glass eel and yellow eel exploitation in Indonesia and the Philippines. From the preliminary surveys, we got data and information about the location and activities of eel fisheries and also the markets in Indonesia and Philippines.

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					
<u>Sub-activity 1.1:</u> Workshop to exchange information on catadromous eels in the region (postponed to 2016)	R				18,000* (Not implemented yet)
<u>Sub-activity 1.2:</u> Survey on trends of catadromous eel fisheries including glass eel catch (14-18 January, 13-18 February, 15-19 March, 15-17 & 27-28 June 2015)	I		8		8,000**
<u>Sub-activity 1.3:</u> Survey on commercial distribution/trade of catadromous eels including glass eel (14-18 January, 13-18 February, 15-19 March, 15-17 & 27-28 June 2015)	R		8		8,000**
Activity 2: Improvement of data collection and statistics on eel fisheries					
<u>Sub-activity 2.1:</u> Study on catadromous eel species identification by DNA technology (January to June 2015)	R		8		8,000**

* Sub-activity 1.1 will be conducted on Feb 2016.

** Sub-activities 1.2, 1.3 and 2.1 were conducted in the same researches simultaneously.

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Clear understanding on current situation of resources, fisheries and utilization		
<u>Sub-activity 1.1</u> Workshop to exchange information on catadromous eels in the region	Mutual understanding of the present status of catadromous eel fisheries among AMSs.	In consideration of the convenience for the participants, it is postponed until Feb 2016.
<u>Sub-activity 1.2</u> Survey on trends of catadromous eel fisheries including glass eel catch	Understanding of the present status and recent trend of eel fisheries and eel resources in the region.	We got information of the trends and intensity of eel capture including glass eel catch through the surveys conducted in Indonesia and the Philippines.
<u>Sub-activity 1.3</u> Survey on commercial distribution/trade of catadromous eels including glass eel	Understanding the amount and route of trading of eel in AMSs.	We got information of the commercial distribution and trades in Indonesia and the Philippines and the status of eel trades and markets in AMS through the surveys.
Activity 2 Improvement of data collection and statistics on eel fisheries		
<u>Sub-activity 2.1</u> 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.	DNA templates were prepared from the samples collected in Bengkulu (Indonesia) and Cagayan (Philippines). Further analysis regarding DNA sequence will be conducted in future.

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1. Eel fisheries research in Member Countries	SEAFDEC Newsletter Vol. 38 No.1, Jan-March 2015.	

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	
<p><u>Sub-activity 1.1:</u> Workshop to exchange information on catadromous eels in the region</p>	<p>Since we have postponed the holding workshop until Feb 2016, there is no evaluation in present.</p>
<p><u>Sub-activity 1.2:</u> Survey on trends of catadromous eel fisheries including glass eel catch</p>	<p>Since this sub-activity has conducted only by IFRDMD and SEC, there is no evaluation from the member countries of SEAFDEC. We evaluated our results ourselves from this sub-activity as “good”, in consideration with these results noted as follows:</p> <ul style="list-style-type: none"> - We got the data and information about the feature, recent trends and intensity of eel capture in Bengkulu (Sumatra Is., Indonesia). Only the eel with around 150-200 grams in weight (not the glass eel) is captured by fishermen then collected by the eel collectors. Gathered eels are reared in fiberglass tank without feed supplies before transferring to another region. These results indicate that Bengkulu has a huge potential of eel fishery. - On the other hand, in Palabuhan Ratu (West Java, Indonesia), fishermen catch the glass eel at night then they send it to eel collector. There are small-scale eel culture facilities for nursing and rearing the glass eels into consumption weight (around 200-250 g). From the elver stage, some of them are transferred to other buyers, in order to rear them to an average weight of 200 g before transporting to other places for eel farmers to rear them to marketable size. - In the case in the Philippines, fishermen started catching glass eels from four years ago then quitted in 2014, because of the decline of the price. They will resume catching glass eel again if someone will order the glass eels and the price will rise higher.
<p><u>Sub-activity 1.3:</u> Survey on commercial distribution/trade of catadromous eels including glass eel</p>	<p>Since this sub-activity has conducted only by IFRDMD and SEC, there is no evaluation from the member countries of SEAFDEC. We evaluated our results ourselves from this sub-activity as “good”, in consideration with these result noted as follows:</p> <ul style="list-style-type: none"> - Since we have conducted observations on fishermen, fish collectors, small and large eel farm and the marketing channel, we got the information regarding the distribution and trade of eels in Indonesia rather clearly. - On the contrary, identifying the marketing channel of eels is still difficult in the Philippines.
Activity 2 Improvement of data collection and statistics on eel fisheries	
<p><u>Sub-activity 2.1:</u> Study on catadromous eel species identification by DNA technology</p>	<p>Since this sub-activity has conducted only by IFRDMD and SEC, there is no evaluation from the Member Countries of SEAFDEC. We evaluated our result ourselves from this sub-activity as “so-so”, in consideration with these result noted as follows:</p> <ul style="list-style-type: none"> - We noticed the need for improvement of the method of DNA sequencing.

6. Major Impacts/Issues

1. We will hold a postponed workshop for exchanging the information on catadromous eels in the region on Feb 2016.
2. We noticed the importance of the dissemination and the fulfillment of regulation on the export of eel seeds (e.g. less than 150 grams in Indonesia).

We need to improve the methodologies for data collection and species identification methods using DNA sequence.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1: Clear understanding on current situation of resources, fisheries and utilization		
<u>Sub-activity 1.1</u> Workshop to exchange information on catadromous eels in the region	Sharing and exchanging information on catadromous eels in the region among AMSs through a workshop focusing on its fisheries that participating. We will hold this workshop in Feb 2016 with the participants of eel experts from AMS.	0 *Use the balance brought forward for having Workshop allocated in 2015.
<u>Sub-activity 1.2</u> Survey on trends of catadromous eel fisheries including glass eel catch	Collecting the information and data by surveying on eel fisheries in 3 countries 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 2017.	12,000
<u>Sub-activity 1.3</u> Survey on commercial distribution/trade of catadromous eels including glass eel	Finding out the present status of eel trade and market in AMSs through interviewing the stakeholders on commercial distribution and trade on tropical eels. The surveys will also be conducted during the years of 2015 to 2017 in 3 countries.	9,000
Activity 2: Improvement of data collection and statistics on eel fisheries		
<u>Sub-activity 2.1</u> Study on catadromous eel species identification by DNA technology	Conducting studies on species identification among the genus <i>Anguilla</i> in 3 countries, 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.	12,000
<u>Sub-activity 2.2</u> 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.	9,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1 Clear understanding on current situation of resources, fisheries and utilization	
<u>Sub-activity 1.1:</u> Workshop to exchange information on catadromous eels in the region	We can share and exchange the information among AMSs then make better understanding on catadromous eel from the Workshop.
<u>Sub-activity 1.2:</u> Survey on trends of catadromous eel fisheries including glass eel catch	We can get the data on trend and intensity of eel fisheries in 3 countries then make better understanding on current situation of eel resources.
<u>Sub-activity 1.3:</u> Survey on commercial distribution/trade of catadromous eels including glass eel	We can get the data on commercial distribution and trade of tropical eels then make better understanding on utilization of eel resources.
Activity 2 Improvement of data collection and statistics on eel fisheries	
<u>Sub-activity 2.1:</u> Study on catadromous eel species identification by DNA technology	We can improve the methodology of species identification using DNA technology.
<u>Sub-activity 2.2:</u> Study on statistical data collection methodologies	We can get continuous and reliable statistics on catch and trading/ transferring of tropical eels in the region.

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1 Clear understanding on current situation of resources, fisheries and utilization												
<u>Sub-activity 1.1:</u> Workshop to exchange information on catadromous eels in the region												
<u>Sub-activity 1.2:</u> Survey on trends of catadromous eel fisheries including glass eel catch												
<u>Sub-activity 1.3:</u> Survey on commercial distribution/trade of catadromous eels including glass eel												
Activity 2 Improvement of data collection and statistics												
<u>Sub-activity 2.1:</u> Study on catadromous eel species identification by DNA technology												
<u>Sub-activity 2.2:</u> Study on statistical data collection methodologies												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

		Project id: 2015050102	
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia		
Program Thrust:	I	Total Duration:	2015-2019
Lead Department:	IFRDMD	Lead Country:	Thailand
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 305,923
Project Partner:	None	Budget for 2016:	USD 45,771
Project leader:	Dr. Safran Makmur	Involved Country	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 “AMS”). 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.

In the original plan of this project, we scheduled holding the workshop in the first half of 2015 to review activities and methodologies for promotion of inland fisheries. However, through the discussion in IFRDMD with SEAFDEC Secretariat (hereinafter referred to as “SEC”), we decided to renovate the detailed contents and the schedule of our activities in this project. We prioritize the information gathering then specifying the fundamental issues on inland fisheries in the region first. Then we will hold the workshop for reviewing collected information then sharing among the specialists from AMS. Surveys will also be conducted following the renovated contents and schedule being under consideration now.

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

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

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

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

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: Reviewing the activities and the methodologies for promoting inland fisheries in AMS and find a way forward for sustainable development of inland fisheries	Outcome 1: Understanding the present status of inland fisheries in AMS, as a basis of our consideration to find the way for sustainable development of inland fisheries in the region.	Output 1: - Grasping the present status of inland fisheries in the region. - Sharing the data, information and common understanding on inland fisheries in the region among AMS.	Activity 1. Review of activities and methodologies for promotion of inland fisheries and find ways forward Gathering the data and information on present status of inland fisheries in AMS by referring to literature, web sites, interviewing and field surveys. 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.
Objective 2: Seeking and promoting the effective management measures on inland fisheries in AMS	Outcome 2: Building up the skeleton of the framework for the management of inland fisheries in AMS.	Output 2: - 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. - Finding appropriate indicators for an effective management of inland fisheries in AMS. - Enhancing the capacity building on management of inland fisheries in AMS.	Activity 2. Promotion of effective inland fisheries management measures Sharing, exchanging and analyzing the information on co-management and right-based fisheries management in AMS through the seminars and FGDs among fisheries experts, officers and stakeholders. Holding a workshop to formulate guidelines to promote the use of practical and simple indicators for inland fisheries management framework. Opening regional training course(s) for the researchers and officers of AMS to enhance capacity building on improving the management on inland fisheries.
Objective 3: Studying and developing habitat conservation and resource enhancement	Outcome 3: Establishing the comprehensive policies for the management of	Output 3: - Seeking appropriate policies for developing habitat	Activity 3. Study of habitat conservation/ resources enhancement measures Both surveying and

Objective	Outcomes	Outputs	Activities
measures suitable for the region	inland fisheries in the region with relationship with various sectors and stakeholders.	<p>conservation and resources enhancement measures in AMS, with capacity building for handling these issues.</p> <ul style="list-style-type: none"> - Proposal and following discussions among the scientists, officers and the other stakeholders in AMS for establishing the comprehensive policies for the management of inland fisheries in the region. 	<p>capacity building on studying for the development of habitat conservation and for resources enhancement measures applicable to AMS.</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
Activity 1 Review of activities and methodologies for promotion of inland fisheries and find ways forward	<ul style="list-style-type: none"> - 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) - 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)
Activity 2 Promotion of effective inland fisheries management measures	<ul style="list-style-type: none"> - Sharing, exchanging and analyzing the information on co-management and right-based fisheries management in AMS through the seminars and FGDs among fisheries experts, governmental officers and stakeholders. (Sub-activity 2.1) - Holding a workshop to formulate guidelines to promote the use of practical and simple indicators for inland fisheries management framework. (Sub-activity 2.2) - Opening regional training course(s) for both the researchers and officers of AMS to enhance capacity building on improving the management on inland fisheries. (Sub-activity 2.3)
Activity 3 Study of habitat conservation/resources enhancement measures	<ul style="list-style-type: none"> - Surveying and capacity building on studying for the development of habitat conservation and for resources enhancement measures applicable to AMS. (Sub-activity 3.1) - Holding a concluding workshop for establishing the comprehensive policies on inland fisheries management at the end of this program. (Sub-activity 3.2)

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 (newly added): 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)				
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	45,038	25,000	20,000
	Sub-activity 2.2: Holding a workshop to develop guidelines for effective inland fisheries management in the region			20,000		
	Sub-activity 2.3: Opening a regional training course for the improvement on management of inland fisheries				20,000	
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				20,038	
	Sub-activity 3.2: Holding a workshop to develop the policy recommendation on responsible inland fisheries resources utilization in the region					45,038
	Sub-Total Budget	65,038	45,771	65,038	65,038	65,038

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION**1. Achievements of the Project Implementation for the Present Year 2015**

We originally planned the holding of workshop and FGD for reviewing the activities and methodologies for promotion of inland fisheries in the region in the first year of our 5-yr project. However, through our discussion between IFRDMD and SEC, we noticed that we need detailed baseline studies more and gather fundamental information regarding the present status of inland fisheries in the region at first. Since it would spend more periods and grasp the needs what we should do in the region, we decided that we would postpone the having workshop for reviewing until 2016.

As a part of our research activities on reviewing the activities and methodologies on inland fisheries in the region, we investigated the present status of inland fisheries and recorded fishing gears used in Palangkaraya, Central Kalimantan Province, Indonesia, as a part of sub-activity 1.1 (newly added), part of

the activity of an information gathering. The results of this survey are analyzed with the other results from the surveys we will be conducting after this.

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					
<u>Sub-activity 1.1</u> Information gathering for understanding the present status of inland fisheries in the region (27 Apr. - 1 May 2015)	I		3	20 Participants from: NGO; Fishermen; Local government; University.	3,245*
<u>Sub-activity 1.2</u> Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward	I				Not implemented yet
Activity 2 Promotion of effective inland fisheries management measures					
<u>Sub-activity 2.1</u> Studying on co-management and right-based fisheries management applicable to inland fisheries in the region	I				Not implemented yet

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		
<u>Sub-activity 1.1</u> Information gathering for understanding the present status of inland fisheries in the region	Grasping the present status of inland fisheries in the region.	As a part of our research activities on information gathering, the data of the types of fishing gears and the condition of fisheries in Central Kalimantan had been recorded.
<u>Sub-activity 1.2</u> Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward	Sharing the data, information and common understanding on inland fisheries in the region among AMS.	Not implemented yet
Activity 2 Promotion of effective inland fisheries management measures		
<u>Sub-activity 2.1</u> Studying on co-management and right-based fisheries management applicable to inland fisheries in Southeast Asia	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.	Not implemented yet

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1. IFRDMD started off preliminary survey on utilization of inland fisheries	SEAFDEC Newsletter Vol. 38 No.2, Apr-Jun 2015.	

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	
<u>Sub-activity 1.1</u> Information gathering for understanding the present status of inland fisheries in the region	Although we collected data and information of inland fisheries in Central Kalimantan, it is not enough by itself for the investigation. While we will get more data from various places in the region by conducting referring documents and field surveys, it will become more valuable on the comparative studies with the situation in another area/country.
<u>Sub-activity 1.2</u> Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward	Since we have postponed the holding workshop until late 2016, there is no evaluation in present.
Activity 2 Promotion of effective inland fisheries management measures	
<u>Sub-activity 2.1</u> Studying on co-management and right-based fisheries management applicable to inland fisheries in the region	Since we have not conducted major research activities and not gotten results yet on these issues, there is no evaluation in present.

6. Major Impacts/Issues

Since we decided to renovate the detailed contents and the schedule of our activities in this project, we have not conducted research activities up to now, except the survey held in Palankaraya, Central Kalimantan. Therefore, there is no specific issue to note in this section from our present result as of now.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1 Review of activities and methodologies for promotion of inland fisheries and find ways forward		
<u>Sub-activity 1.1</u> Information gathering for understanding the present status of inland fisheries in the region	Gathering the data and information on present status of inland fisheries in AMS by referring to literature, web sites, interviewing and field surveys (continuing from 2015).	25,000
<u>Sub-activity 1.2</u> Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward	Holding a workshop and FGD for reviewing, sharing and exchanging the data and information among the fisheries experts, officers and stakeholders in AMS.	0 *Use the balance brought forward for having Workshop allocated in 2015.
Activity 2 Promotion of effective inland fisheries management measures		
<u>Sub-activity 2.1</u> 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 in AMS through the seminars and FGDs among fisheries experts, governmental officers and stakeholders.	20,771

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1 Review of activities and methodologies for promotion of inland fisheries and find ways forward	
<u>Sub-activity 1.1</u> Information gathering for understanding the present status of inland fisheries in the region	Grasping the present status of inland fisheries in the region.
<u>Sub-activity 1.2</u> Holding a workshop to review activities and methodologies for promotion of inland fisheries and find ways forward	Sharing the data, information and common understanding on inland fisheries in the region among AMS.
Activity 2 Promotion of effective inland fisheries management measures	
<u>Sub-activity 2.1</u> 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.

3. Schedule of Activity for the Year 2016

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												
<u>Sub-activity 1.1</u> Information gathering to understand the present status of inland fisheries in the region.												
<u>Sub-activity 1.2</u> Workshop to review activities and methodologies for promotion of inland fisheries and find ways forward												
Activity 2 Promotion of effective inland fisheries management measures												
<u>Sub-activity 2.1</u> Study on co-management and right-based fisheries management applicable to inland fisheries in the region												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2013020101
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Chemicals and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins (ASP, AZA and BTX) and Harmful Algal Blooms (HABs) in the ASEAN Region		
Program Thrust:	II	Total Duration:	2013 - 2017
Lead Department:	MFRD	Lead Country:	Singapore
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 206,400
Project Partner:	ASEAN-SEAFDEC Member Countries	Budget for 2016:	USD 40,344
Project leader:	Liu Yankai, Scientist (PHTC, AVA)	Involved Country	ASEAN-SEAFDEC Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Consumption of a variety of shellfish and fish which have been contaminated by marine biotoxins causes an increasing number of human intoxications and even deaths around the world. This project is an extension of the Japanese Trust Fund II project on Biotoxins Monitoring in ASEAN and aims to address the needs of Member Countries and continue with capability building in biotoxins analyses and monitoring, with the proposed focus on other biotoxins like Amnesic Shellfish Poisoning (ASP) toxin (Domoic Acid) and Azaspiracids (AZA). The project will also include a component on the identification of biotoxin-producing 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 for the identification of biotoxin-producing HABs. These project activities will culminate in a Technical Compilation publication and an End-of-Project seminar. 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 biotoxin-producing 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 biotoxin-producing 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.

PHTC/AVA, under the MFRD programme, has conducted a project on biotoxins monitoring in ASEAN from 2009 to 2012 to increase the attention in expanding and improving initiatives to monitor, detect and share information on marine biotoxins in order to reduce the public health risks associated with the consumption of contaminate shellfish and fish. The project had covered training in analytical methods for Diarrhoeic Shellfish Poisoning (DSP) toxins, lipophilic toxins, Paralytic Shellfish Poisoning (PSP) toxins and Tetrodotoxin (TTX) and a monitoring survey on PSP toxin in ASEAN Member Countries.

This project is an extension of the previous project to address the needs of Member Countries and continue with capability building in biotoxins analyses and monitoring, with the proposed focus on other biotoxins like Amnesic Shellfish Poisoning (ASP) toxin (Domoic Acid) and Azaspiracids (AZA). These 2 biotoxins were raised as part of the training needs by Member Countries during the RTC of the previous project in 2009. Brevetoxins (BTX) which causes Neurotoxic Shellfish Poisoning (NSP) is also recommended to be included in the new project as ASP, AZA and BTX, along with DSP and PSP, should be regulated according to CODEX for shellfish.

During the End-of-Project seminar for the biotoxins monitoring project in 2012, Member Countries also pointed the importance of identifying biotoxin-producing 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 for MFRD programme to consider conducting a project on toxic HABs to enhance regional capabilities for the identification of biotoxin-producing HAB species. MFRD has taken up this suggestion by including a separate component on biotoxin-producing 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.

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

3.1 Objectives, Outcomes and Outputs of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To upgrade regional laboratory capabilities and credibility for testing of ASP, AZA and BTX biotoxins	Outcome 1: Enhanced laboratory capabilities and knowledge in the testing of ASP, AZA and BTX biotoxins	Output 2: Regional training course in biotoxins (AZA, ASP and BTX) analyses	Activity 2: Organization and conduct of Regional Training Course in Biotoxins (AZA, ASP and BTX) Analyses, 2-6 June 2014, Singapore
Objective 2: To establish monitoring programmes for ASP, AZA and BTX biotoxins in Member Countries for routine surveillance	Outcome 2: Establishment of monitoring programmes for ASP, AZA and BTX biotoxins in Member Countries for routine surveillance	Output 3: Biotoxin monitoring surveys in Member Countries	Activity 3: Organization and conduct of one and half-year Biotoxins Monitoring Survey in 2015-2016
Objective 3: To improve knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in the ASEAN region and facilitate information exchange among Member Countries	Outcome 3: Improved knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in the ASEAN region	Output 1: Regional Technical Consultation	Activity 1: Organization and conduct of Regional Technical Consultation, 24-25 July 2013, Singapore
		Output 3: Biotoxin monitoring surveys in Member Countries	Activity 3: Organization and conduct of one and half-year Biotoxins Monitoring Survey in 2015-2016
		Output 6: Technical Compilation	Activity 6: Preparation and publication of Technical Compilation in 2017
		Output 7: End-of-Project (EOP) Seminar	Activity 7: Organization and conduct of End-of-Project (EOP) Seminar in 3 rd qtr 2017
Objective 4: To improve knowledge and understanding on toxic HAB occurrences and incidences in the ASEAN region	Outcome 4: Improved knowledge and understanding on toxic HAB occurrences and incidences in the ASEAN region	Output 4: Regional Technical Consultation	Activity 4: Organization and conduct of Regional Technical Consultation in 3 rd qtr 2015
		Output 6: Technical Compilation	Activity 6: Preparation and publication of Technical Compilation in 2017
Objective 5: To enhance regional capabilities for identification of biotoxin-producing HAB species in Member Countries	Outcome 5: Enhanced capabilities for the identification of biotoxin-producing HAB species in Member Countries	Output 7: End-of-Project (EOP) Seminar	Activity 7: Organization and conduct of End-of-Project (EOP) Seminar in 3 rd qtr 2017
		Output 5: Regional Training Course in identification of biotoxin-producing HAB species	Activity 5: Organization and conduct of Regional Training Course in Identification of Biotoxin-producing HAB species in 2 nd qtr 2016

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 nd quarter of 2013. It will discuss and plan for all project activities, identify the training needs in the individual Member Countries, determine the content of the training course, identify the venue and expert trainers for the training course, identify the key project leaders and the targeted biotoxins for the surveys in Member Countries.
Activity 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-year)	After the training course, Member Countries are then encouraged to set up the methods learnt in the training course and use the methods for the survey. The survey will involve monitoring the biotoxins levels at identified site(s) over a period of one and half years at regular intervals during the third and fourth year (2015 and 2016) of the project. Biotoxins that were already covered in the training course in 2010 (for example Diarrhetic Shellfish Poisoning, DSP and lipophilic toxins, TTX) can also be included in the survey if Member Countries are interested. The survey aims to improve Member Countries' understanding on the level of ASP, AZA and BTX biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region.
Activity 4: Regional Technical Consultation on Biotoxin-producing HAB species Identification (2 days)	A Regional Technical Consultation (RTC) will be held in Singapore in 3 rd quarter 2015 to initiate this component of the project and plan for all activities. All ASEAN-SEAFDEC Member Countries will be invited to the meeting and to participate in the activities. ASEAN-SEAFDEC Member Countries will present country reports on toxic HAB occurrences and incidences as well as the management of toxic HABs in their waters. A Key Project Leader (KPL) for each country will be appointed to be responsible for the project's activities in his or her country. The meeting will finalize the details of the training course to be conducted in 2016 and identify the necessary expert trainers and training needs in the region. The meeting will also initiate the process to establish a network or directory of responsible national authorities or HAB experts in the region.
Activity 5: Regional Training Course in Biotoxin-producing HAB species Identification (4/5 days)	This Regional Training Course will be conducted in Singapore in 2 nd quarter 2016. The training course will be conducted by invited expert trainers and it is envisaged that the methods for identifying biotoxin-producing 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 biotoxin-producing HAB species.
Activity 6: Technical Compilation (10-12 months)	The Technical Compilation of the project will be prepared and published in the final year (2017). 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 identification of biotoxin-producing HAB species, the country reports on toxic HAB occurrences and incidences as well as the management of toxic HABs in their waters and, the list/directory of responsible national authorities and HAB experts in Member Countries.

Activity	Description
Activity 7: End-of-Project (EOP) Seminar (2 days)	The End-of-Project (EOP) Seminar will be held in the 3 rd quarter of 2017. The EOP will present and discuss the reports and results of the biotoxins monitoring surveys conducted by Member Countries, country reports on HABs, discuss the challenges faced during the project implementation and plans for future projects or activities nationally and regionally, and finalize the Technical Compilation for publication.

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

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
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	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	-
Activity 4: Regional Technical Consultation on Biotoxin-producing HAB species Identification	-	-	-	31,700	-	-
Activity 5: Regional Training Course in Biotoxin-producing HAB species Identification	-	-	-	-	31,344	-
Activity 6: Technical Compilation	-	-	-	-	4,000	4,000
Activity 7: End-of-Project (EOP) Seminar	-	-	-	-	-	40,000
	Sub-Total	35,500	28,700	49,200	40,344	44,000

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

With regards to the Biotoxins Monitoring Survey, Cambodia has withdrawn from conducting the survey while the other participating Member Countries should have started their surveys this year. To date, only Thailand has submitted the survey's quarterly progress reports.

The Regional Technical Consultation (RTC) on Harmful Algal Blooms (HABs) in the ASEAN region was successfully organized and conducted in Singapore from 5-6 August 2015. Each ASEAN-SEAFDEC Member Countries sent two representatives to attend the RTC and presented country reports on toxic HAB occurrences and incidences, as well as the management of toxic HABs in their waters. In preparation for the Regional Training Course to be conducted in Singapore next year, the meeting agreed that Dr. Yasuwo Fukuyo will be the principal expert trainer. The meeting also discussed the individual training needs of each Member Country which would be taken into consideration in the planning of the Regional Training Course. Finally, the meeting identified the Key Project Leaders for each country and initiated the process of establishing a network or directory of responsible national authorities and HAB experts 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 3 Biotoxins Monitoring Survey					
<u>Sub-activity 3.1:</u> Setting up of Biotoxins Analyses Methodologies					10,000
<u>Sub-activity 3.2:</u> Implementation of Biotoxins Monitoring Survey	R	10	0	0	5,000
Activity 4 Regional Technical Consultation on Biotoxin-producing HAB species Identification	P	20	1	3	26,900

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 3: Biotoxins Monitoring Survey	- Surveys carried out in at least 8 ASEAN-SEAFDEC Member Countries	- Surveys carried out in 9 Member Countries except Cambodia.
Activity 4: Regional Technical Consultation on Biotoxin-producing HAB species Identification	<ul style="list-style-type: none"> - Organization and conduct of the meeting in Singapore in 3rd quarter 2015. - Participation by at least 8 ASEAN-SEAFDEC Member Countries - Plan for Regional Training Course in Identification of Biotoxin-producing HAB species in the region 	<ul style="list-style-type: none"> - The Meeting was successfully organized and conducted in Singapore on 5-6 August 2015. - All 10 ASEAN-SEAFDEC Member Countries participated with two representatives each. - The Meeting discussed the training needs of Member Countries and agreed on the details of the course and expert trainer. The course is scheduled to be conducted in Singapore in 2nd qtr 2016.

4. List of Completed Publications and Others

List of completed publications for the year 2015	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 4: Regional Technical Consultation on Biotoxin-producing HAB species Identification	The meeting had achieved its objectives and also met the expectations of the majority of the participants who had only positive feedback on its organization and conduct.

6. Major Impacts/Issues

- Improved understanding and knowledge on toxic HAB occurrences and incidences in the region.
- The training needs of Member Countries were discussed and will be taken into account in the planning of the Regional Training Course so that training will be relevant and useful to help upgrade regional capabilities in identification of toxic HAB species.
- No major issues in project implementation in 2015 except for withdrawal of Cambodia to conduct the biotoxin monitoring survey and late submission of quarterly progress reports for the biotoxin monitoring survey by Member Countries.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 3: Biotoxins Monitoring Survey	Continuation of the one and a half year biotoxins monitoring surveys initiated in 2015 in nine Member Countries except Cambodia. The survey is scheduled to end by 2 nd qtr 2016.	5,000
Activity 5: Regional Training Course in Biotoxin-producing HAB species Identification (4 days)	This Regional Training Course will be conducted in Singapore in 2 nd quarter 2016. The training course will be conducted by invited expert trainers and it is envisaged that the methods for identifying biotoxin-producing 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 biotoxin-producing HAB species.	40,000
Activity 6: Technical Compilation (10-12 months)	The Technical Compilation of the project will be prepared and published in the final year of the project in 2017. 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 identification of biotoxin-producing HAB species, the country reports on biotoxins and toxic HAB occurrences and incidences, and their management in Member Countries, and the list/directory of responsible national authorities, biotoxins and HAB experts in Member Countries.	4,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 3: Biotoxins Monitoring Survey (One and half-year – 2015-mid 2016)	<ul style="list-style-type: none"> - Completion of the surveys carried out in at least 8 ASEAN-SEAFDEC Member Countries. - Technical reports by Member Countries on the conduct and results of their monitoring surveys.
Activity 5: Regional Training Course in Biotoxin-producing HAB species Identification (4 days)	<ul style="list-style-type: none"> - Organization and conduct of the training course in Singapore in 2nd quarter 2016. - Participation by at least 8 ASEAN-SEAFDEC Member Countries.
Activity 6: Technical Compilation (10-12 months: mid 2016 - mid 2017)	<ul style="list-style-type: none"> - Preparation and publication of the Technical Compilation as a reference material on Biotoxins and HABs for the region.

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 3: Biotoxins Monitoring Survey (One and half-year: 2015-mid 2016)												
Activity 5: Regional Training Course in Biotxin-producing HAB species Identification (4/5 days)												
Activity 6: Technical Compilation (10- 12 months: mid 2016 - mid 2017)												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2015020102
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Cold Chain Management for Seafood		
Program Thrust:	II	Total Duration:	2015 - 2017
Lead Department:	MFRD	Lead Country:	Singapore
Donor/Sponsor:	Singapore	Total Donor Budget:	USD 136,120
Project Partner:	ASEAN-SEAFDEC Member Countries	Budget for 2016:	USD 10,000
Project leader:	Tan Shing Yee, Scientist (PHTC, AVA)	Involved Country	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 would 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 each Member Countries, followed by a Mid-term Evaluation and Progress Meeting. Each Member Country would use the results and data from the pilot trials, as well as technical knowledge gained from the workshop, to draft a section or sections of the generic guidelines on cold chain management for seafood for publication. The project would conclude with an End-of-Project Seminar. The expected outputs for this project are: a Workshop on Cold Chain Management for Seafood, a publication on generic guidelines on cold chain management for seafood and an End-of-Project Seminar.

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

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, Outcomes and Outputs of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To assist in upgrading the regional seafood industry in cold chain management and technologies.	Outcome 1: Establishment and improvement of cold chain management and technologies in the regional seafood industry.	Output 1: Workshop on Cold Chain Management of Seafood. Output 2: Supply Chain/ Cold Chain Pilot Trials	Activity 1: Organization and conduct of Project Inception and Planning Meeting, 19 – 20 May 2015, Singapore. Activity 2: Organization and conduct of Workshop on Cold Chain Management for Seafood, 17 – 19 November 2015, Singapore. Activity 3: Organization and conduct of one-year Supply Chain/ Cold Chain pilot trials in participating Member Countries in 2016. Activity 4: Organization and conduct of Mid-term Evaluation and Progress Meeting in 1 st qtr 2017.

Objective	Outcomes	Outputs	Activities
Objective 2: To develop generic guidelines on cold chain management for the seafood industry in the region.	Outcome 2: Development of generic guidelines on cold chain management for seafood.	Output 3: Generic guidelines on cold chain management for seafood.	Activity 5: Preparation and publication of Guidelines on Cold Chain Management for Seafood in 2017
		Output 4: End-of-Project Seminar	Activity 6: Organization and conduct of End-of-Project Seminar in 4 th quarter 2017

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Project Inception and Planning Meeting	A 2-day Project Inception and Planning Meeting will be held in Singapore to discuss and plan for all project activities. Two participants each from Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam who are involved in the seafood industry will be invited to attend; one of whom should be from the private sector. The meeting will provide an opportunity for a better overview and understanding of the seafood cold chain resources and practices in these countries, and briefly assess the requirements/ deliverables for each project activity. The meeting will also identify the key project leader in each country and commercial co-operants, if any, for the project.
Activity 2: Workshop on Cold Chain Management for Seafood	<p>A Regional Workshop on Cold Chain Management for Seafood will be organized by MFRD and conducted in Singapore. MFRD proposes to engage an overseas expert in seafood cold chain management to be the resource speaker/trainer for this workshop. Two participants from each country will be invited to attend, one of whom should be from the private sector. The workshop will include lectures and hands-on practicals on the best practices and technologies for seafood cold chain management, incorporating discussion of end-user and food safety specifications. Participants will learn the temperature logging techniques to monitor the cold chain from harvest to end-user/consumer, with measurement of product quality parameters (e.g. microbiological analyses, drip loss, quality index development, etc). Participants will also be taught how to undertake supply chain monitoring within companies or with specific seafood groups, and develop performance indicators to evaluate the impacts of adopting proper cold chain practices in the seafood business. Good manufacturing and handling practices to ensure product safety and quality will also be emphasized in the course. Field visits to a few Singapore seafood companies may be arranged to understand the supply chain practices in Singapore's seafood industry.</p> <p>The workshop will also discuss to agree on the necessary steps and timelines to meet the project objective to develop a set of generic guidelines on cold chain management for the seafood industry in the region.</p>
Activity 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: Mid-term Evaluation and Progress Meeting	A 2-day Mid-term 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	Each country will draft a section or sections of the Guidelines on Cold Chain Management for Seafood. The various sections will be compiled and edited by PHTC/AVA which will then publish the Guidelines for distribution to ASEAN member countries.
Activity 6: End-of-Project Seminar	An End-of-Project Seminar will be organized in Singapore or another Member Country as agreed to share the results of the project among the Member Countries. Two participants from each Member Country will be invited to attend of which at least one should be from the private sector.

3.3 Activity, Sub-activity and Proposed Budget for 2015-2017

(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: Mid-term 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 Seminar	-	-	-	21,720
	Sub-Total Budget	77,680	10,000	48,440

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Activity 1: Project Inception and Planning Meeting

The Project Inception and Planning Meeting was successfully conducted in Singapore from 19-20 May 2015. The Meeting was attended by 22 participants from both government and private sectors of 10 ASEAN-SEAFDEC member countries. The Member Countries presented their country reports on the current situations, national regulations and challenges on the cold chain management for seafood. The Meeting discussed and agreed on the plans for the future activities for project implementation, including the upcoming workshop in Qtr 4 2015. The Meeting also identified the Key Project Leader and commercial co-operant, as well as the key seafood commodities for each Member Country. A group email was initiated for networking and correspondences on the future activities. Two resource speakers from the local seafood industry were also invited to share their experience, insight and challenges faced in implementing cold chain management in their companies.

Activity 2: Workshop on Cold Chain Management for Seafood

The Workshop on Cold Chain Management for Seafood will be organized by PHTC/AVA and conducted in Singapore from 17-19 Nov 2015. Expert consultants in seafood cold chain management from Australia will be engaged as the resource trainers for this workshop. Two participants from each Member Country will be invited to attend the workshop, one of whom should be the commercial co-operant from the private

sector. The workshop will include lectures and hands-on practical sessions 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 Singapore seafood companies may be arranged to understand the supply chain practices in Singapore's seafood industry. The workshop will also discuss the necessary steps and timelines to develop a set of generic guidelines on cold chain management for the seafood industry 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 Project Inception and Planning Meeting	O	22	0	3	18,000
Activity 2 Workshop on Cold Chain Management for Seafood*	T	20	0	3	55,960 (estimate)

*To be conducted on 17-19 Nov 2015

3. Achievements and Expected Outcomes/Outputs of the Activity

Planned activity	Expected outcome/outputs	Achievements
Activity 1 Project Inception and Planning Meeting	<ul style="list-style-type: none"> - Organization and conduct of the meeting in Singapore in 2nd quarter 2015. - Participation by at least 8 ASEAN-SEAFDEC Member Countries. - Plan for all project activities. 	<ul style="list-style-type: none"> - The Meeting was successfully organized and conducted in Singapore from 19-20 May 2015. - Attended by 22 participants from both government and private sectors of all 10 ASEAN-SEAFDEC member countries. - The Meeting planned and agreed on the details and schedule for all project activities.
Activity 2 Workshop on Cold Chain Management for Seafood (To be conducted on 17-19 Nov 2015)	<ul style="list-style-type: none"> - Organization and conduct of the workshop in 4th qtr 2015 - Participation by at least 8 ASEAN-SEAFDEC Member Countries - Participants equipped with knowledge and skills for implementing and monitoring the cold chain management for seafood and development of generic guidelines on cold chain management of seafood. 	<ul style="list-style-type: none"> - The Workshop was successfully organized and conducted in Singapore from 17-19 Nov 2015 - The Workshop was attended by both government and private sectors representatives from all 10 ASEAN-SEAFDEC member countries. - The Workshop : <ul style="list-style-type: none"> • Introduced concept & importance of cold chain management for seafood starting from fishing vessels. • Provided methods/ approaches for developing quality index for the selected key seafood commodities (finfish, prawn, squid, crab). • Introduced the following technologies/ best practices for cold chain management: <ul style="list-style-type: none"> ○ Freezing/ chilling/ defrosting/ thawing ○ Packaging ○ Temperature & humidity sensing system • Discussed regulatory/ trade requirements and guidelines for cold chain management of

Planned activity	Expected outcome/outputs	Achievements
		seafood. <ul style="list-style-type: none"> Familiarized participants with processes and resources needed for establishing cold chain systems for the key seafood commodities.

4. List of Completed Publications and Others

List of completed publications for the year 2015	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 1: Project Inception and Planning Meeting	The meeting had achieved its objectives and also met the expectation of the majority of the participants who had positive feedback on its organization and conduct.
Activity 2: Workshop on Cold Chain Management for Seafood	<i>To be conducted on 17-19 Nov 2015.</i>

6. Major Impacts/Issues

Activity 1: Project Inception and Planning Meeting

Improved understanding of the current practices and situations in cold chain management for seafood in Member Countries. This information would be taken into account in the planning of upcoming activities to upgrade the regional capabilities and resolve the gaps in cold chain management for seafood.

Activity 2: Workshop on Cold Chain Management for Seafood (*To be conducted on 17-19 Nov 2015*)

Participants will gain relevant knowledge in the implementation of cold chain management for their key seafood commodities, development of quality indices for the seafood commodities, best practices and relevant technologies for cold chain management, as well as establishing regulatory/ trade requirements and guidelines for cold chain management for seafood.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
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 for one or two seafood commodities. 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.	10,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 3 Supply Chain/ Cold Chain pilot trials	<ul style="list-style-type: none"> - Implementation of pilot trials on cold chain management by at least 8 ASEAN-SEAFDEC Member Countries for key seafood commodities at targeted stages of the seafood supply chain. - Technical reports on the cold chain pilot trials by Member Countries including analysis and evaluation of the results before and after implementation of cold chain management on key seafood commodities.

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 3 Supply Chain/ Cold Chain pilot trials												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

		Project id: 2015030101	
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region		
Program Thrust:	II	Total Duration:	2015 - 2019
Lead Department:	AQD	Lead Country:	Philippines
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 361,074
Project Partner:	None	Budget for 2016:	USD 66,159
Project leader:	Takuro Shibuno, AQD DC	Involved Country	SEAFDEC Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

This Project titled “Reinforcement and optimization of fish health management and the effective dissemination” is being proposed to:

1) Develop and accelerate rapid and effective fish and shrimp health management

Preventive management strategies should be established to maintain the disease-free status for cultured stocks. Technology for early detection of these devastating viruses should be developed using optimized practical molecular diagnostic tools.

2) Enhance efficacy of vaccine treatment in tropical cultured species

Vaccines for NNV and WSSV have been developed. However, the efficacies of these treatments need further improvement. Technology of oral delivery of vaccine will be developed for the practical use in aquafarmers using carriers possessing immunomodulatory to enhance the overall immunogenicity of the vaccine.

3) Establish protective measures against persistent and emerging parasitic diseases of tropical fish

Avoidance of persistent and emerging parasitic diseases is of prime importance to secure sustainable production of food fish in the Southeast Asian Region. To avoid economic losses due to pressing problems attributed to parasitic infections in cultured fish, novel and practical prevention and control strategies should be established. Additionally, the species diversity of emerging parasites including their morphological characteristics and life cycle should be thoroughly investigated.

4) Identify risk factors and develop protective measures against Early Mortality Syndrome (EMS)

Based on the etiological agents together with identification of risk and protective factors, the protective measures will be developed against EMS. Guidelines to protect shrimp from EMS will be established.

5) Extend & demonstrate technology to practitioners, officers, etc. of Member Countries

Training programs will be implemented on specific topics based on the request from Member Countries, which necessitate the information dissemination on fish health management. In the first year, 2015, the 2-3 day course about EMS will be commenced in Myanmar.

2. Background and Justification

The Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC/AQD) initiated the Fish Disease Projects funded by the Government of Japan in response to numerous requests from various sectors for intensified research on fish health-related problems arising in the Southeast Asian region. Phase I (2000-2004) of the said projects focused on technologies to control diseases through timely and accurate recognition, sound diagnostic capabilities, and control measures for various diseases. Phase II (2005-2009) focused on disease surveillance activities based on the results of the earlier program. Thereafter, the importance of accelerating the delivery of information awareness among aquafarmers and the establishment of disease prevention methods emerged after reviewing the outcomes of the previous two project phases. To attain the above targets, Phase III (2010-2014) with the main topic “Accelerating awareness and capacity building in Southeast Asia” has been focusing on the greater dissemination of knowledge relevant to fish health management, especially to the SEAFDEC Member Countries whose capacities still need to be developed and improved. At the same time, innovative researches and technology development have been also implemented.

An integrated fish-health-care system expected to be established through the Phase III project aimed to ensure a holistic approach toward “healthy and wholesome” aquaculture practices enabling a stable supply of safe aquaculture products. The concept of the holistic approach was one of the six themes under Sustainable Aquaculture during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People” that was held in Bangkok in November 2001, and later in June 2011.

In practice, irrespective of the correct direction of the approach, however, there are still high needs for information dissemination and technology transfer in the Member Countries, especially in lesser developing countries in terms of fish health management. In addition, serious issues relevant to the fish health management to be overcome have been often emerging, battering and disconcerting aqua farmers as shown in emerging diseases like Early Mortality Syndrome (EMS) hindering the wholesome development of aquaculture in our region. Realizing that the global market has become more stringent for exporting countries like Southeast Asian countries, it is highly recommended to effectively disseminate the useful information such as precaution of potential diseases outbreak and recommendation of appropriate fish health management to local government unit officers, aquafarmers, traders etc. promptly and appropriately. Urging better understanding on the risks, impacts and management problems related to diseases is very important because health management practices significantly affect product quality as well as quantity, and thus link with the economic stability for aquafarmers and fisheries community development.

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

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To develop and accelerate rapid and effective fish and shrimp health management	Outcome 1: Development and acceleration of rapid and effective fish and shrimp health management.	Output 1: Establishment of the early and effective intervention strategies through strict monitoring of the health status on cultured shrimp and fish by the farmers.	Activity 1: Development and acceleration of rapid and effective fish and shrimp health management - Determination of threshold infection levels for WSSV, AHPND and VNN at different age/weight ranges - Development of optimized q-PCR protocols for the detection of AHPND
Objective 2: To enhance efficacy of vaccine treatment in tropical cultured	Outcome 2: Enhancement of efficacy of vaccine treatment in tropical	Output 2: Development of the practical method of delivering vaccine to fish with increased efficacy	Activity 2: Enhancement of efficacy of vaccine treatment in tropical cultured species

Objective	Outcomes	Outputs	Activities
species	cultured species.	<p>thereby preventing unwarranted outbreaks of VNN in hatcheries and grow-out culture systems.</p> <p>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.</p>	<ul style="list-style-type: none"> - 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. - Evaluation of the efficacy of RNAi in protecting shrimp against WSSV infection - Development of delivery scheme using a combination of the antiviral treatments - Development of low-cost delivery method for the antiviral treatments: tank studies - Field Efficacy Evaluation of the combined antiviral treatment
<p>Objective 3: To establish protective measures against persistent and emerging parasitic diseases of tropical fish</p>	<p>Outcome 3: Establishment of protective measures against zoonotic diseases of fish.</p>	<p>Output 3: Establishment of practical and efficient protocol for the prevention and control of persistent and emerging fish parasites</p>	<p>Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish</p> <ul style="list-style-type: none"> - Development of practical strategies that could be adopted by farmers to address the pressing problem on mass mortalities of net-caged and pond reared fishes attributed to persistent and emerging fish parasites
<p>Objective 4: To identify risk factors and develop protective measures against Early Mortality Syndrome (EMS) /Acute Hepatopancreatic Necrotic Disease (AHPND)</p>	<p>Outcome 4: Development of protective measures against emerging diseases.</p>	<p>Output 4: Establishment of practical and effective methods for the prevention and control of EMS</p>	<p>Activity 4: Epidemiology of the Early Mortality Syndrome (EMS)</p> <ul style="list-style-type: none"> - Development of the protective measures against EMS, based on the etiological agents together with identification of risk and protective factors. - Establishment of guidelines to protect shrimp from EMS.
<p>Objective 5: To extend & demonstrate technology to practitioners, officers,</p>	<p>Outcome5: Technology extension and demonstration to practitioners,</p>	<p>Output5: Effective and functional development of fish health management and guarantee for the sustainable development</p>	<p>Activity 5: Technology extension and demonstration</p> <ul style="list-style-type: none"> - Implementation of training programs on specific

Objective	Outcomes	Outputs	Activities
etc. of member countries	officers, etc. of Member Countries through training courses.	of aquafood production together with the poverty alleviation in Southeast Asian countries.	topics based on the request from Member Countries, which necessitate the information dissemination on fish health management.

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Development and acceleration of rapid and effective fish and shrimp health management	<p>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 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>
Activity 2: Enhancement of efficacy of vaccine treatment in tropical cultured species	<p><u>Sub-activity 2.1</u> Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish</p> <p>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><u>Sub-activity 2.2</u> Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV</p> <p>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</p>

Activity	Description
	<p>as RNAi. Similar to above, methods for vaccine production for WSSV will be adopted from JTF5 studies. The delivery vehicle will be based on the results of the previous vaccination study in shrimp. In addition, recent trends utilizing RNAi as an antiviral strategy in shrimp culture will be adopted. After the shrimp have been subjected to these antiviral treatments, the shrimp will be experimentally challenged based on established procedures. Efficacy of the vaccines/RNAi treatment will be evaluated based on RPS. The expected output from the study is a method of delivering vaccine to shrimp with increased efficacy and prevention of white spot disease by interfering with its replication in the host. (Location: Philippines and other Member Countries concerned)</p>
<p>Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish</p>	<p>The primary goal of this study is to develop practical strategies that could be adopted by farmers to address the pressing problem on mass mortalities of net-caged and pond reared fishes attributed to persistent and emerging fish parasites. The efficacy of new anti-parasitic agents in consonance with good aquaculture practices will be examined. In addition, the species diversity, morphology and life cycle, and epidemiology of emerging parasites in both marine and freshwater fishes will be investigated. Once pertinent data are generated, prevention and control measures against these parasites could be instituted.</p>
<p>Activity 4: Epidemiology of the Early Mortality Syndrome (EMS) /Acute Hepatopancreatic Necrotic Disease (AHPND)</p>	<p>Early Mortality Syndrome (EMS) otherwise known as Acute Hepatopancreatic Necrosis Syndrome (AHPNS) is an emerging disease affecting most Southeast Asian Countries whose putative disease-causing agent has been confirmed recently to be <i>Vibrio parahaemolyticus</i>. This study will try to develop protective measures based on the etiological agents together with identification of risk factors and protective factors. Visit to farms with (EMS/AHPNS) outbreaks (Thailand, Viet Nam, and Indonesia) will be undertaken to collect samples and other farm data. Samples of EMS/AHPNS –“infected” shrimp will be analyzed using histopathological techniques. Measures to exclude the pathogen from the farm, good management practices, good nutrition, and proper handling of the fish to prevent unnecessary stress to the animals will be formulated. From these broad measures, specific protocols to prevent the outbreak of 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)</p>
<p>Activity 5: Technology extension and demonstration</p>	<p>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)</p>
<p>Activity 6: Publication</p>	<p>Manuals, posters, pamphlets and flyers describing disease prevention methods will be published and distributed.</p>
<p>Activity 7: Annual progress meeting and international workshop</p>	<p><u>Sub-activity 7.1</u> 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><u>Sub-activity 7.2</u> International workshop The workshop, not only receive participants from member countries, but also invite expert scientists as key note speakers to facilitate to spread and exchange brand-new information on fish health management between SEAFDEC and various institutions.</p>

Activity	Description
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 2015-2019)

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 1: Development and acceleration of rapid and effective fish and shrimp health management		11,000	8,800	8,800	8,800	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	8,800	8,800
	Sub-activity 2.2: Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	11,000	8,800	8,800	8,800	8,800
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish		11,000	8,800	8,800	8,800	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	14,000	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	10,000
Activity 8: Coordination by the project leader		6,438	4,159	4,159	4,159	4,159
	Sub-Total Budget	81,438	66,159	66,159	66,159	81,159

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

The envisaged outcomes for the first year are: 1) Development and optimization of Q-PCR and LAMP methods for detection of economically important shrimp (WSSV, IHNV, MBV) and fish (VNN) viruses, 2) Examination of the field efficacy of the recombinant WSSV vaccine previously developed in JTF5, 3) Examination of the field efficacy of the inactivated NNV vaccine previously developed in JTF5, 4) Elucidation on the effect of different tilapia species, against EMS/AHPND bacteria, 5) Identification of persistent and emerging parasites affecting net-caged and pond-reared tropical fishes, and, 6) 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					
<u>Sub-activity 2.1</u> Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish					
<u>Sub-activity 2.2</u> Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	R	0	2	0	2,000
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	T				15,000

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	Development and optimization of Q-PCR and LAMP methods for detection of economically important shrimp (WSSV, IHHNV, MBV) and fish (VNN) viruses	Development and optimization of Q-PCR and LAMP methods for detection of economically important shrimp (WSSV, IHHNV, MBV) and fish (VNN) viruses
Activity 2 Enhancement of efficacy of vaccine treatment in tropical cultured species		
<u>Sub-activity 2.1</u> 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	To immunogenicity of the vaccine previously established in JTF5 in pompano reared in floating net cages in the open sea (IMS) was investigated. The immunogenicity of the vaccine was determined through intraperitoneal injection of fish and periodic monitoring of the NNV-neutralizing antibodies in the sera of the fish after vaccination. The survival rate and virus titer in both vaccinated and unvaccinated fish was determined at the termination of the experiment.

Planned activity	Expected outcome/output	Achievements
Sub-activity 2.2 Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	Efficacy of RNAi treatment determined in tank trials	The efficacy of a microparticle-delivered recombinant WSSV VP28 sub-unit vaccine for shrimp has been previously determined. The goal of the present project is to determine the efficacy of a combined recombinant protein and dsRNA as antiviral treatment against WSSV. Preliminary experiments are in the pipeline to optimize conditions for the production of dsRNA and efficacy trials. These included LD ₅₀ test, production of dsRNA from bacteria, and isolation of primary cells from shrimp lymphoid organs. The antiviral efficacy of the treatments will then be decided by in vivo challenge.
Activity 3 Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	Infection experiments to determine conditions for susceptibility or resistance and disease transmission cycle and established protocols for the prevention of unwarranted outbreaks of parasite infestations.	(1) Quantification of the parasite load of <i>P. lantauensis</i> in <i>Epinephelus coioides</i> in conjunction with water quality parameters, (2) Dynamics of the transmission of <i>P. lantauensis</i> under laboratory conditions and the pathological effects on naturally and experimentally infected grouper were elucidated and (3) Knowledge of the strategies adopted by parasites aided in understanding host-parasite interactions may help in the formation of practical and effective disease prevention and control.
Activity 4 Epidemiology of the Early Mortality Syndrome (EMS)/ Acute Hepatopancreatic Necrotic Disease (AHPND)	Elucidation of the efficiency of different tilapia species against or mitigates the effect of AHPND	Elucidation of the effect of different tilapia species (<i>T. niloticus</i> , <i>T. mossambicus</i> , <i>T. hornarum</i>) on the EMS/AHPND bacterium.
Activity 5 Technology extension and demonstration	Assessment of training needs for capacity building of SEAFDEC Member Countries	Significant mortalities of freshwater aquatic species such as tilapia, carp, eel and as well as prawn have been a persistent problem in Myanmar. Fish bacterial pathogens have been speculated to be the culprit but no scientific evidences have been so far generated to address this supposition. Thus, a 3- day training course on diagnostic procedures that focuses on diseases of freshwater fishes of bacterial etiology will be conducted in 2015. Theoretical and hands-on exercises will not only enhance the knowledge and skills of the trainees but importantly serve as tool in the conduct of a guided research that will be proposed and implemented by selected fish health staff.

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
No		

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	
<u>Sub-activity 2.1</u> Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	
<u>Sub-activity 2.2</u> 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. 2015

6. Major Impacts/Issues

Implementation of these activities and sub-activities were delayed due to delayed submission of complete proposals to SEAFDEC AQD in the first year of JTF6.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1 Development and acceleration of rapid and effective fish and shrimp health management	Viral and bacterial diseases such as VNN, WSSV and AHPND have caused major constraints in marine finfish and shrimp farming in most Asian countries and in the world. Early detection of these devastating pathogens is the most efficient response to be able to implement immediate and appropriate interventions for the control of the spread of infection. The major objective of the study is to determine the threshold levels of infection of WSSV, AHPND and VNN using q-PCR. Specifically, the short-term objectives are to determine infection levels of the pathogens at different age and weight ranges using q-PCR and adopt PCR, q-PCR and LAMP-based protocols for the detection of AHPND developed and optimized in other laboratories.	8,800
Activity 2 Enhancement of efficacy of vaccine treatment in tropical cultured species		
<u>Sub-activity 2.1</u> Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	The second vaccination run/ trial of the formalin-inactivated NNV vaccine in pompano will be conducted. Also, pilot testing of the of the formalin-inactivated NNV vaccine in other marine fish spp. (groupers, sea bass) in other 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 will be carried out. Finally, the formalin-inactivated NNV vaccine containing an immunoadjuvant will be developed.	8,800

Proposed Activity	Description of Proposed Activity	Proposed Budget
<p><u>Sub-activity 2.2</u> Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV</p>	<p>In 2016, a delivery scheme using a combination of the antiviral treatments will be developed. Since the individual efficacies of these antiviral treatments leave much to be desired, it is therefore beneficial if the combined efficacies of these treatments can be packaged in one vaccination scheme. This activity will be the focus of year 2. The mechanisms of antiviral protection by vaccination with recombinant protein are different from that of RNAi. By vaccinating shrimp, the immune system is primed by exposing the shrimp to a particular antigen making it possible for the antigen/pathogen to be recognized and bound upon subsequent exposure. In RNAi, a double stranded RNA molecule homologous to a viral RNA is administered. This molecule triggers a series of reactions culminating in the degradation of the viral mRNA preventing its replication. A combination of the two antivirals at different ratios will be tested. After oral administration following previous protocols, shrimp will be experimentally infected with WSSV and 10 day cumulative mortalities recorded and compared statistically.</p>	8,800
<p>Activity 3 Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish</p>	<p>Additional experimental transmission of <i>P. lantauensis</i> in grouper will be conducted and transmission trials of parasite load of prevalent monogenean in seabass (<i>Lates calcarifer</i>) will be investigated.</p>	8,800
<p>Activity 4 Epidemiology of the Early Mortality Syndrome (EMS) / Acute Hepatopancreatic Necrotic Disease (AHPND)</p>	<p>The greenwater culture system has been proven to be effective against luminous bacteria caused by <i>Vibrio harveyi</i> in TF 1. The efficiency of the greenwater culture system against another shrimp disease AHPND/EMS caused by another <i>Vibrio</i>, <i>V. parahaemolyticus</i>, will be investigated in TF 6. The effect of different tilapia species against <i>V. parahaemolyticus</i> was elucidated in 2015. For 2016, the effect of other aquatic species, such as those with high market value, on AHPND/EMS bacterium will be investigated through tank experiments.</p>	8,800
<p>Activity 5 Technology extension and demonstration</p>	<p>Because significant mortalities of freshwater fish species have been a persistent problem in Cambodia, a 3-day specialized training course that focuses on fish bacteriology will be conducted in 2016. Theoretical and hands-on exercises to be included in the training will not only enhance the knowledge and skills of the trainees but importantly serve as tool in the conduct of a guided research that will be proposed and implemented by selected fish health staff.</p>	14,000
<p>Activity 6 Publication</p>		0
<p>Activity 7 Annual progress meeting and international workshop</p>		
<p><u>Sub-activity 7.1</u> Annual progress meeting</p>	<p>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.</p>	4,000
<p><u>Sub-activity 7.2</u> International workshop</p>		0
<p>Activity 8 Coordination by the project leader</p>	<p>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.</p>	4,159

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1 Development and acceleration of rapid and effective fish and shrimp health management	Threshold levels of infection of WSSV, AHPND and VNN at different age/weight ranges shall have been determined. PCR, q-PCR and LAMP-based protocols for the detection of AHPND shall have been developed and optimized.
Activity 2 Enhancement of efficacy of vaccine treatment in tropical cultured species	
<u>Sub-activity 2.1</u> Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	Formalin-inactivated NNV vaccine in VNN endemic areas of the country and/or SEAFDEC member country field-tested and its efficacy established. Kinetics of NNV-neutralizing antibody titers in the sera of vaccinated and unvaccinated marine fish (grouper) collected at scheduled intervals post- vaccination quantified. Relative percent survival of the vaccinated and unvaccinated fish determined at the termination of the experiment (harvest). NNV titer in the brains and kidneys of surviving and dead fish in both vaccinated and unvaccinated fish quantified. Formalin-inactivated NNV vaccine with immunoadjuvant developed.
<u>Sub-activity 2.2</u> Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	At the end of 2016, a delivery scheme using a combination of the antiviral treatments shall have been developed. It is expected that a combination of the two antivirals will yield data on the optimum ratio to be adopted. Further, an <i>in vivo</i> challenge test to determine the efficacy of the combined antivirals shall have been completed towards the end of the last quarter.
Activity 3 Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	Infection experiments to determine conditions for susceptibility or resistance and disease transmission cycle and established protocols for the prevention of unwarranted outbreaks of parasite infestation in marine fish species (grouper and seabass).
Activity 4 Epidemiology of the Early Mortality Syndrome (EMS) / Acute Hepatopancreatic Necrotic Disease (AHPND)	Elucidation on the effect of different aquaculture species especially those with high market value (<i>i.e.</i> grouper, seabass, siganid, <i>etc.</i>) on AHPND/EMS bacteria.
Activity 5 Technology extension and demonstration	1) Bacterial diseases affecting economically important fish species in Cambodia identified; 2) Accurate diagnosis of the bacterial disease problem effectively carried out using standard methods; 3) Practical and economically sound disease prevention and control strategies appropriate for the identified problem effectively implemented; and 4) Basic research on fish bacteriology successfully carried out by fish health personnel and research outputs published in refereed journals.

3. Schedule of Activity for the Year 2016

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												
<u>Sub-activity 2.1</u> Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish												

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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)												
Activity 5 Technology extension and demonstration												
Activity 6 Publication												
Activity 7 Annual progress meeting and international workshop												
Sub-activity 7.1 Annual progress meeting												
Sub-activity 7.2 International workshop												
Activity 8 Coordination by the project leader												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

Project id: 2013010104

Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Strategies for Trawl Fisheries By-catch Management (FAO-GEF/REBYC-II CTI)		
Program Thrust:	III	Total Duration:	4 years (2012 to 2015)
Lead Department:	TD	Lead Country:	Viet Nam
Donor/Sponsor:	GEF	Total Donor Budget:	USD 3,000,000
Project Partner:	FAO	Budget for 2016:	USD 100,500
Project leader:	Secretary-General of SEAFDEC as Steering Committee Members		

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Building on the successes of the REBYC phase-I, during year 2002-2008, FAO/UNEP/GEF project “Reduction of Environmental Impact from Tropical Shrimp Trawling through the Introduction of By-catch Reduction Technologies and Change of Management (REBYC)”, it had a relatively strong focus on technology and the development of selective gear. While the Project Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI) generated significant results, the experience showed that more was needed to successfully address the complex issues related to bycatch reduction. Gear modifications are important but they are not always the most appropriate tool or they may need to be combined with other management measures. This is particularly the case in multi-species trawl fisheries of the type found in Southeast Asia and the Pacific region where overall management is weak and bycatch is largely utilized and considered part of the total catch. Gear modification solutions also need to be supported by appropriate legal and incentive frameworks to become effective. Moreover, the socioeconomic drivers behind bycatch and livelihoods and poverty context need to be understood and considered. While initially this holistic approach may be more costly and require more efforts, it is cost-effective in the longer-term because of the sustainability of the results.

2. Background and Justification

Building on the lessons and experiences from REBYC Phase I and following the “International Guidelines on Bycatch Management and Reduction of Discards”, the REBYC-II CTI project is contributing to the sustainable use of fisheries resources and healthier marine ecosystems in the Coral Triangle and Southeast Asia waters, by reducing bycatch, discards and the impact from trawl fisheries on the environment. The Project will run for four years, having become operational in November 2011, with activities commencing in April 2012.

The REBYC-II CTI Project is executed by the technical execution partners, the Southeast Asian Fisheries Development Center (SEAFDEC), based in Thailand, and the governments of the participating countries Indonesia, Papua New Guinea, Philippines, Thailand and Viet Nam, in partnership with national, regional and international organizations and the private sector. The Project includes participation from a wide range of stakeholders, comprising national and regional policy makers, fishing and fishmeal industry and NGOs. SEAFDEC hosts the Regional Facilitation Unit (RFU) at its Training Department in Samut Prakan, to which the FAO Project Regional Coordinator is attached. The RFU is responsible for overall technical and administrative support and for delivery of the regional outputs.

The project is structured around four interrelated components:

1. The Policy, legal and institutional frameworks component works towards the establishment of national or area specific trawl fisheries bycatch management plans and building institutional capacity for their implementation. The need for adequate legislation and regulations to support the implementation of improved management measures is also being addressed.
2. The Resource management and fishing operations component is leading to the adoption of more selective fishing gear and fishing practices, and provides a basis for implementing the zoning of fishing areas and developing spatial-temporal closure management measures, as well as generating data on the number of vessels and making recommendations for fishing effort and capacity management. Results from this component are informing regional bycatch policy/strategy and the national and/or area specific trawl fisheries bycatch management plans.
3. The Information management and communication component includes bycatch data collection (at landing sites and onboard vessels), the mapping of fishing grounds, establishment of socio-economic monitoring procedures, and means for communicating bycatch data and information, including a project website and information, education and communication through IEC materials.
4. Awareness and knowledge component seeks to raise awareness of and knowledge on, trawl fisheries bycatch management issues and how they relate to sustainability, and what measures can make trawl fishing more responsible. Under this component, private sector/fishers, policy makers, fisheries managers, officials, extension officers and NGOs attend training and workshops to enhance their knowledge of best management practices and responsible fisheries.

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

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1:	Trawl fishery policy and management reforms based on the International Guidelines on Bycatch Management and Reduction of Discards, APFIC Trawl Fisheries	Output 1: Project management and planning and adopted national work plans for 2015-2016 and potential strategies for the project implementation for the remaining project period.	Activity 1: Provision of technical and administrative support to the REBYC-II CTI partner countries. Activity 2: Facilitation of the Project Steering Committee Meeting for Project Management Activity 3: Follow-up to the result of the Mid-Term Evaluation (MTE)
	Guidelines and Ecosystem Approach to Fisheries Management (EAFM)	Output 2: Human resource capacity in the Participating Countries for the sustainable management of their coastal fisheries, including trawl fisheries.	Activity 4: Convening Regional Workshops to enhance human resource capacity and technical support of national activities of REBYC-II CTI Participating Countries Activity 5: Drafting of working papers in related with Regional overview of policy and legal framework for trawl fisheries and trawl bycatch policy/strategy.

3.2 Overall Scope/Description of Project

Activity	Description
1. Provision of technical and administrative support to the REBYC-II CTI partner countries.	This is core function of the RFU, and will involve coordination of agreed activities and the collation of outputs at the country level. The RFU will support the participating countries in the implementation of national activities through facilitating the exchange of experiences and the provision of advice to address technical as well as institutional issues. The lessons from the national level activities will be consolidated and packaged for Project use and for dissemination to third party. Where necessary, SEAFDEC RFU staff will carry out visits to the various national project sites.
2. Convening Regional Workshops to enhance human resource capacity and technical support of national activities of REBYC-II CTI Participating Countries	RFU and SEAFDEC will collaborate to provide technical support to Participating Countries on the relevant scientific topic, including 1) Policy, legal and institutional frameworks component 2) Resource management and fishing operations component, 3) Information management and communication component and 4) Awareness and knowledge component. RFU staffs incorporate with Lead Technical Officer (LTO) stations at FAO head quarter in Rome, will draft working papers in related with Regional overview of policy and legal framework for trawl fisheries and trawl bycatch policy/strategy.
3. Maintenance of the Project website and development of communication materials.	SEAFDEC will continue to develop and maintain the project website in which the relevant information (e.g. project documents, reports, tool kits/methodologies and news items) will be regularly published. This will include some re-organisation of the site to streamline access to information on the site.
4. Engagement with Government, NGOs and private sector organisations	Through participation in the fishmeal round table discussions and other public/private fora, SEAFDEC staff will promote the work of SEAFDEC and the REBYC-II CTI Project and actively look for opportunities to cooperate with government organisations, the private sector and NGOs. This could include technical and information support to Fishery Improvement Projects (FIP) and other certification schemes being implemented by other organisations.

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

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1. Provision of technical and administrative support to the REBYC-II CTI partner countries.	Sub-activity 1.1 Provision of technical and administrative support to the REBYC-II CTI partner countries.	53,700	20,700	41,000	40,000	xxxx
	Sub-activity 1.2 Workshop on Development of Work plans	-	22,000	30,000		
	Sub-activity 1.3 Facilitation of the Project Steering Committee Meeting	17,500	13,000	35,000		

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 2. Convening Regional Workshops to enhance human resource capacity and technical support of national activities of REBYC-II CTI Participating Countries		89000	147,000	101,000	65,000	xxxx
	Sub-activity 2.1 Technical support to Member Countries*			(18,000)		
	Sub-activity 2.2 Regional Workshop on Socioeconomic and Project Progress (Ongoing)			(35,000)		
	Sub-activity 2.3: LEAD EAFM Development	-		(40,000)		
Activity 3 Maintenance of the Project website and development of communication materials.		400	400	500	500	
Activity 4 Engagement with Government, NGOs and private sector organizations		-	-	-	-	xxxxxx
	Sub-Total	168,200	190,600	199,500	105,500	xxxxxx

* Budget will be considered and finalized in November year 2015

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

“Strategies for trawl fisheries bycatch management” aims to contribute to the more sustainable use of fisheries resources and healthier marine ecosystems in the Coral Triangle and Southeast Asian waters by reducing bycatch, discards and fishing impact by trawl fisheries and the project expects that this can be achieved through implementation of trawl fisheries bycatch management plan in each pilot site in the five (5) participating countries including the Philippines. Activities were conducted from year 2015 which was emphasized to develop better approaches in all ecological, human, and institutional and legal components.

Participating Countries of REBYC-II CTI and RFU have reviewed and assessed progress achieved in work plans and budget plan for the year 2014-15. Official protocol to develop the Letter of Agreement and Term of Agreement of REBYC-II CTI of Participating Countries, Philippines and Indonesia were approved by FAO. Ongoing process on LOA and TOA of PNG, Thailand and Viet Nam. There was collaboration among the Project monitoring on activities of Participating Countries and RFU of REBYC-II CTI in year 2015 that had been agreed.

Project partners have developed activities based on the concept of Trawl fishery policy and management reforms based on the International Guidelines on Bycatch Management and Reduction of Discards and

APFIC Trawl Fisheries Guidelines and Ecosystem approach to fisheries management (EAFM) in particular human resource capacity building on socio-economic and gender mainstreaming in trawl fisheries. The coordination between relevant project partners, *e.g.* FAO-APFIC, FAO-BOBLME, NOAA, SEAFDEC-Sweden Project, Japanese Trust Fund of SEAFDEC and IMA-UK to develop appropriated fisheries management from Ecosystem Approach for decision maker, policy maker, called LEAD EAFM, has being carried out. The coordination with fisheries private sectors in Participating Countries, acknowledge the rationale and collaborate in national level, among project staff, government agencies and private sectors in trawl fisheries of 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. Provision of technical and administrative support to the REBYC-II CTI partner countries.	O				XXXX
<u>Sub-activity 1.1</u> Provision of technical and administrative support to the REBYC-II CTI partner countries.	O	12	5	2	
<u>Sub-activity 1.2</u> Workshop on Development of Work plans	C, O	9	4	1	
<u>Sub-activity 1.3</u> Facilitation of the Project Steering Committee Meeting	C, O	20	5	2	
Activity 2. Convening Regional Workshops to enhance human resource capacity and technical support of national activities of REBYC-II CTI Participating Countries*	R, T, C				XXXX
<u>Sub-activity 2.1</u> Technical support to Member countries	T, P	75	6		
<u>Sub-activity 2.2</u> Regional Workshop on Socioeconomic and Project Progress (Ongoing)		12	5		
<u>Sub-activity 2.3</u> LEAD EAFM Development		1	8		
Activity 3. Maintenance of the Project website and development of communication materials.	I		2		XXXX
Activity 4. Engagement with Government, NGOs and private sector organizations	P	25	3		XXXX

* Report in Steering Committee Meeting of Project REBYC-II CTI

** 1) Essential-EAFM Training courses for

- PNG
- Viet Nam
- Thailand

2) Support to the Socio-economic study; PNG (Aug – Oct 2015)

3) Support to Socio-economic workshop; Philippines (Aug-Sep 2015)

4) Expert Workshop on the development of EAFM LEAD materials

5) Regional workshop on Socio-economics

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
<p>Activity 1. Provision of technical and administrative support to the REBYC-II CTI partner countries.</p>	<p>Implementation plan until project ending in year 2016</p>	<ul style="list-style-type: none"> - Participating Countries of REBYC-II CTI and RFU have reviewed and assessed progress achieved in work plans for the years 2014-2015; - Participating Countries of REBYC-II CTI and RFU have agreed on the work plan and budget design for year 2015 as well as for the collaborative design among Participating countries and Lead Technical Officer and SEAFDEC on the supporting activities of RFU in year 2015; - Letter of Agreement and Term of Agreement of REBYC-II CTI of Participating Countries, Philippines and Indonesia were approved by FAO (Ongoing process on LOA and TOA of PNG Thailand and Viet Nam); - Collaboration on the Project monitoring on activities of Participating Countries of REBYC-II CTI in year 2015
<p>Activity 2. Convening Regional Workshops to enhance human resource capacity and technical support of national activities of REBYC-II CTI Participating Countries</p>	<p>Human resource capacity in the Participating Countries for the sustainable management of trawl fisheries.</p>	<ul style="list-style-type: none"> - REBYC-II CTI Participating Countries understood concept of Ecosystem Approach to Fisheries Management (EAFM) applied for Trawl Fisheries Management; - Coordination between relevant project of Fisheries management FAO REBYC-II CTI, FAO BOBLME, NOAA, FAO APFIC SEAFDEC-Sweden Project and IMA-UK to develop appropriated fisheries management develop from Ecosystem Approach for decision maker, policy maker, called LEAD EAFM; - Develop activities based on the concept of Trawl fishery policy and management reforms based on the International Guidelines on Bycatch Management and Reduction of Discards and APFIC Trawl Fisheries Guidelines and Ecosystem approach to fisheries management (EAFM); - Human resource capacity building on Socioeconomic and gender mainstreaming in trawl fisheries
<p>Activity 3. Maintenance of the Project website and development of communication materials.</p>	<p>Website operational</p>	<ul style="list-style-type: none"> - SEAFDEC will continue to develop and maintain the project website in which the relevant information (<i>e.g.</i> project documents, reports, tool kits/methodologies and news items) will be regularly published. This will include some re-organisation of the site to streamline access to information on the site.
<p>Activity 4. Engagement with Government, NGOs and private sector organizations</p>	<p>Coordination among trawl fisheries stakeholder through awareness and knowledge building on trawl fisheries bycatch management and their related to sustainability in trawl fisheries</p>	<ul style="list-style-type: none"> - The fishmeal roundtable discussions and other public/private fora, REBYC-II CTI technical staff will technically support and promote the work of Project and relevant SEAFDEC activities and actively look for opportunities to cooperate with government organisations, the private sector and NGOs. This could include technical and information support to Fishery Improvement Projects (FIP) and other certification schemes being implemented by other organisations.

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
Report on Project Steering Committee meeting	Hard Copy	

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

Planned Activity	Evaluation/ Views from Participants
Activity 1	Participating Countries reviewed and assessed progress achieved in work plans for the years 2014-15. Financial position of the Project and expenditure has been agreed by project partners. The final stages of the project, including a Lessons learned workshop and the final project evaluation have been discussed and agreed on the duration to organized
Activity 2	Human resource capacity in the Participating Countries for the sustainable management of trawl fisheries through Ecosystem Approach to Fisheries Management. Human well-being is one of the constraints to apply EAFM, with that FAO HQ kindly technical support to Project by assign expert to facilitate and help participating countries on the evaluation are research socio-economic of trawl fisheries in participating countries. Project has also kindly be supported by NOAA-US on the same topic. For the identification of sensitive area for area-based management, participating countries has emphasize as one of the project outcomes. Participating Countries are able to undertake the study/research of critical area for proper management by each country.
Activity 3	Participating countries have their websites to disseminate their countries activities.
Activity 4	The private sectors in participating countries acknowledged the information of project REBYC-II CTI. There were good collaboration in national level, among project staff, government agencies and private sectors in trawl fisheries of participating countries. REBYC-II CTI technical staffs provided technical support and promote the work of Project and relevant SEAFDEC activities and cooperate with government organisations, the private sector and NGOs to better fisheries managing.

6. Major Impacts/Issues

Conventional concept(s) of trawl fisheries management are generally emphasized in Southeast Asia, *e.g.* management by government fisheries authority, regulation and penalties (top-down process), single species (or target species), fish stock and population (science based) and etc.. Aforementioned managements are obviously not effective to manage trawl fisheries in Southeast Asia region in regarding to less coordination from trawl fishers. Trawl fisheries are complex management in particular trawl is closely involved with economic and supply chain. Trawl fisheries is significant related with demand of trash fish as material for animal meal and fish meal. Human dimension including with socioeconomic, various stakeholder in trawl fisheries and other downstream sector in trawl fisheries product, become significant drivers in trawl fisheries.

Theses core threats are major issues to sustainable develop trawl fisheries management in SEA region. To develop management plan for trawl fisheries and bycatch management, holistic perspective of fisheries management is required and emphasized by manager. It is the integration of various components, *e.g.* policy legal and institutional frameworks, multi-stakeholder identification-analysis-participation, co-management, socio-economic in particular trawl fisheries economic incentive, and etc. Trawl fisheries management is possible to conceptualize through Ecosystem Approach (EA) strategy. Moving toward trawl fisheries management through EA strategies is needed to strengthen on human capacity in EA view point. Development on appropriated methods and tools in trawl fisheries management need to focus on multi-stake holders includes fisheries manager, decision maker, researcher, fishing communities, stakeholder of trawl fisheries (fishers, companies or associations), consumer as well as others involves in trawl fisheries.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016**1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016**

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1 Provision of technical and administrative support to the REBYC-II CTI partner countries. <ul style="list-style-type: none"> - Provision of technical and administrative support to the REBYC-II CTI partner countries. - Support to the Final Project Review 	This is the core function of the RFU, and will involve coordination of agreed activities and the collation of outputs at the country level. The RFU will support the participating countries in the implementation of national activities through facilitating the exchange of experiences and the provision of advice to address technical as well as institutional issues. The lessons from the national level activities will be consolidated and packed for Project use and for dissemination to third party. When necessary, SEAFDEC RFU staff will carry out visits to the various national project sites.	40,000
Activity 2 Convening Regional Workshops to enhance human resource capacity and technical support of national activities of REBYC-II CTI Participating Countries <ul style="list-style-type: none"> - REBYC Regional Write shop, - Assessment and evaluation of the use of JTEDs in Samar Sea, the Philippines and Samar Sea Management Plan case study, Video Production, and - Support to the Lessons learned Workshop and Final Project Steering Committee Meeting 	RFU and SEAFDEC will collaborate to provide technical support to Participating Countries on the relevant scientific topic, including component 1) Policy, legal and institutional frameworks; component; 2) Resource management and fishing operations; component; 3) Information management and communication; and component 4) Awareness and knowledge.	65,000
Activity 3 Maintenance of the Project website and development of communication materials.	SEAFDEC will continue to develop and maintain the project website in which the relevant information (<i>e.g.</i> project documents, reports, tool kits/methodologies and news items) will be regularly published. This will include some re-organisation of the site to streamline access to information on the site.	500
Activity 4 Engagement with Government, NGOs and private sector organisations	Through participation in the fishmeal roundtable discussions and other public/private fora, SEAFDEC staff will promote the work of SEAFDEC and the REBYC-II CTI Project and actively look for opportunities to cooperate with government organisations, the private sector and NGOs. This could include technical and information support to Fishery Improvement Projects (FIP) and other certification schemes being implemented by other organisations.	-

* Budget will be considered and finalized in November year 2015

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1. Provision of technical and administrative support to the REBYC-II CTI partner countries. <ul style="list-style-type: none"> - Provision of technical and administrative support to the REBYC-II CTI partner countries. - Support the Lessons learned workshop (Feb 2016) – End project - Support the Final Project Review 	Implementation plan until project ending phase in year 2016 Conclusion the lesson learned for Participating Countries of Project REBCY-II CTI in trawl fisheries management. Project final report
Activity 2 Convening Regional Workshops to enhance human resource capacity and technical support of national activities of REBYC-II CTI Participating Countries Sub-activity 2.1 REBYC Regional Write shop Sub-activity 2.2 Assessment and evaluation of the use of JTEDs in the Philippines and Indonesia <ul style="list-style-type: none"> - REBYC Regional Write shop; (Dec 2015) - Assessment and evaluation of the use of JTEDs in Samar Sea, the Philippines and Samar Sea Management Plan case study, Video Production - Support the Lessons learned workshop (Feb 2016) – End project 	The REBYC-II CTI project aims to continue to address the challenges by promoting sustainable fishing practices. One of the measurement options is to encourage the adoption of best fishing practices, and providing a rational approach to delivering benefits from landed by-catch as well as the development of management plans in with the private sector at both national and regional levels, including the preparation of “best practice guidelines for fishing operations” and considering the experience and expertise of SEAFDEC in the application of gear modification in the Southeast Asian region. Various management approaches to sustainable fisheries resource and trawl fisheries in participating countries cooperation will be investigated and to be reported as one of project results
Activity 3 Maintenance of the Project website and development of communication materials.	Website operational
Activity 4 Engagement with Government, NGOs and private sector organisations	Coordination among trawl fisheries stakeholder through awareness and knowledge building on trawl fisheries bycatch management and their relation to sustainability in trawl fisheries

3. Schedule of Activity for the Year 2016

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

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 01201305
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Promotion of Countermeasures to Reduce IUU Fishing		
Program Thrust:	III	Total Duration:	2013 - 2017
Lead Department:	TD	Lead Country:	Malaysia
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD176,500
Project Partner:	None	Budget for 2016:	USD 29,400
Project leader:	ITRDH/TD	Involved Country	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.

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

3.1 Objectives, Outcome and Output of the Project

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

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1. Promotion of Regional Fishing Vessels Record (RFVR)	<p><i>Sub-activity 1.1: Development and management of RFVR Database</i> Follow up the approval of the Regional Fishing Vessels Record (RFVR) activity by the SEAFDEC Council at its 45th Meeting in 2013. The database of regional vessels record of 24 meters in length and over has been designed and developed in collaboration with SEAFDEC Member Countries. The database will be used as a tool to combat IUU fishing in the region.</p> <p><i>Sub-activity 1.2: Technical workshop on RFVR database development and management</i> The technical workshop will be organized. 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 are in charge for handling this database will visit each country to discuss and consult for development and management on database of RFVR of 24 meters in length and over.</p> <p><i>Sub-activity 1.3: Technical assistance on using of RFVR Database</i> The technical assistance on using of RFVR database PSMs facilities and existing mechanism in SEAFDEC Member Countries will be conducted. The output information will be used to prepare and organize on-site training and workshop on strengthening of PSMs and other surveillance measures to reduce IUU fishing in collaboration with SEAFDEC Member Countries.</p>
Activity 2. Strengthening of Port State Measures and other surveillance measures in the region	<p><i>Sub-activity 2.1: Providing technical assistance on PSMs facilities and existing mechanism in SEAFDEC Member Countries</i> The technical assistance on PSMs facilities and existing mechanism in SEAFDEC Member Countries will be conducted. The output information will be used to prepare and organize on-site training and workshop on strengthening of PSMs and other surveillance measures to reduce IUU fishing in collaboration with SEAFDEC Member Countries.</p>

Activity	Description
	<i>Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region</i> In this activity, regional consultations to discuss and identify applicable PSM in the region will be organized in collaboration with SEAFDEC Secretariat.
Activity 3: Production of information materials	Production on information and promotional materials such as VDO, poster, report and <i>etc.</i> 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 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1: Promotion of Regional Fishing Vessels Record (RFVR)	Sub-activity 1.1: Development and management of RFVR Database					
	Sub-activity 1.2: Technical workshop on RFVR database development and management	20,000	17,000	31,280		
	Sub-activity 1.3: Technical assistant on using of RFVR Database			3,520	10,000	10,000
Activity 2: Strengthening of Port State Measures and other surveillance measures in the region	Sub-activity 2.1: Providing technical assistance on PSMs facilities and existing mechanism in SEAFDEC Member Countries	23,000	9,000			
	Sub-activity 2.2: Facilitating implementation of PSM in the Southeast Asian Region		10,400		18,400	19,000
Activity 3: Production of information materials		2,000	500	1,000	1,000	400
	Sub-Total	45,000	36,900	35,800	29,400	29,400

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year 2015

- Strategies and way forward for Asian Member States and SEAFDEC to prevent, deter and eliminate IUU fishing through utilization of RFVR; and
- Agreement of AMSs on management and updating the RFVR 24 meters in length and over

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)					
<u>Sub-Activity 1.1</u> Monitoring and updating of RFVR database 24 meters in length and over					
<u>Sub-Activity 1.2</u> Regional consultation on RFVR database development and management	P	20	16		23,814.88
<u>Sub-activity 1.3</u> Technical assistance on using of RFVR Database	P		4		2,392.82
Activity 2. Strengthening of Port State Measures and other surveillance measures in the region					
<u>Sub-Activity 2.1</u> On-site training and workshop on strengthening of PSMs and other surveillance measures to reduce IUU fishing in the 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)		
<u>Sub-Activity 1.1:</u> 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: Regional consultation on RFVR database development and management	Regional Fishing Vessel Record database in the region	<ul style="list-style-type: none"> - Strategies and way forward for Asian Member States and SEAFDEC to prevent, deter and eliminate IUU fishing through utilization of RFVR - Agreement of AMSs on management and updating the RFVR 24 meters in length and over - Recommendation and way forward on implementation RFVR Database less than 24 meters
<u>Sub-activity 1.3:</u> Technical assistance on using of RFVR Database	Regional Fishing Vessel Record database in the region	Way forward activities for the project implementation for next year
Activity 2: Strengthening of Port State Measures and other surveillance measures in the region		
<u>Sub-Activity 2.1:</u> On-site training and workshop on strengthen of PSMs and other surveillance measures to reduce IUU fishing in the region	Awareness building of countermeasures as a tool to reduce IUU fishing in the region	Implementation of this sub-activity in 2015 has been postponed. Title of this sub-activity will be changed to “Facilitating implementation of PSM in the Southeast Asian Region” starting 2016.
Activity 3: Production of information materials	Awareness building of countermeasures as a tool to reduce IUU fishing in the region	The report of Regional Technical Consultation on the Regional Fishing Vessels Record (RFVR): Use and Way Forward of RFVR Database as a Management Tool to Reduce IUU Fishing in Southeast Asian Region

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
The report of Regional Technical Consultation on the Regional Fishing Vessels Record (RFVR): Use and Way Forward of RFVR Database as a Management Tool to Reduce IUU Fishing in Southeast Asian Region (In progress)	Hardcopy and softcopy	

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1	
Sub-activity 1.2	
Sub-activity 1.3	
Activity 2	
Sub-activity 2.1	
Activity 3	

6. Major Impacts/Issues

As a result of Regional Technical Consultation on the Regional Fishing Vessels Record (RFVR) held in June 2015, basic information on the RFVR Database was included to 28 items as an agreement of AMSs. The information form was updated and sent to AMSs. The updating of information on the RFVR Database has been done when the information is submitted to TD.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1. Promotion of Regional Fishing Vessels Record (RFVR)		
<u>Sub-activity 1.1</u> Development and management of RFVR Database	The communication with National Focal Point from concern Member Countries will be conducted for updating the information of the RFVR Database	-
<u>Sub-activity 1.2</u> Technical assistance 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	10,000
Activity 2. Strengthening of Port State Measures and other surveillance measures in the region		
<u>Sub-activity 2.1.</u> Facilitating implementation of PSM in the Southeast Asian Region	The Expert Consultation will be organized in collaboration with SEAFDEC/SEC. The Consultation aims at discussion and consideration on suitable PSM for implementation in the region.	18,400
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 and disseminated to the SEAFDEC Member Countries and worldwide.	1,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1. Promotion of Regional Fishing Vessels Record (RFVR)	
<u>Sub-activity 1.1</u> Development and management of RFVR Database	Updating and improving data and information
<u>Sub-activity 1.2</u> Technical assistant on using of RFVR Database	Regionally-concerted countermeasures to reduce IUU fishing through practical utilization and monitoring the usage of the RFVR Database
Activity 2. Strengthening of Port State Measures and other surveillance measures in the region	
<u>Sub-activity 2.1</u> Facilitating implementation of PSM in the Southeast Asian Region	Cooperation with Member Countries on suitable PSM implementation in the region
Activity 3. Production of information materials	Countries awareness building and common understanding of countermeasures to reduce IUU fishing in the region

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1. Promotion of Regional Fishing Vessels Record (RFVR)												
<u>Sub-activity 1.1</u> Development and management of RFVR Database	X	X	X	X	X	X	X	X	X	X	X	X
<u>Sub-activity 1.2</u> Technical assistance on using of RFVR Database	X	X	X	X	X	X	X	X	X	X	X	X
Activity 2. Strengthening of Port State Measures and other surveillance measures in the region												
<u>Sub-activity 2.1</u> Facilitating implementation of PSM in the Southeast Asian Region			X									
Activity 3. Production of information materials					X	X	X	X	X	X	X	X

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2013040101
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Combating IUU Fishing in the Southeast Asian Region through Application of EU Catch Certification for Trading of Fish and Fishery Products		
Program Thrust:	III	Total Duration:	2013 - 2017
Lead Department:	MFRDMD	Lead Country:	Singapore
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 129,884
Project Partner:	TD, Secretariat	Budget for 2016:	USD 12,884
Project leader:	Abdul Razak Latun	Involved Country	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 (CDS). The guidelines and ASEAN CDS 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 will be 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 of the regulation for international trade in fish and fishery products within the region.

This project corresponds to #8 of the Resolution at the ASEAN-SEAFDEC conference in 2011: Foster cooperation among ASEAN Member Countries and with international and regional organizations in combating IUU fishing. This project also corresponds to #67 of the Plan of Action at the conference:

Strengthen cooperation among Member Countries to implement international standards with regards to trading on fish and fishery products within the ASEAN region.

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

3.1 Objectives, Outcomes and Outputs 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 system	Output 3: Establishment and dissemination of ASEAN catch documentation system	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 will be held for effective program implementation. The meetings were held in 2013, 2015 to discuss on 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 (CDS). Terminal Meeting of the project will be held in 2017.
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. MFRDMD will formulate and disseminate "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" under the ASEAN framework. MFRDMD will assist SEAFDEC Member Countries for implementation of the Guidelines.

Activity	Description
Activity 3 Establishment and dissemination of a possible catch documentation scheme in the region	MFRDMD will facilitate establishment and dissemination of a possible catch documentation scheme which is applicable in ASEAN region.

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
Activity 1: Meetings for Effective Program Implementation	Sub-activity 1.1 Core Expert Meetings	32,604		32,604		
	Sub-activity 1.2 Terminal Core Expert Meeting					32,604
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	
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	396
Sub-Total Budget		33,000	18,000	33,000	12,884	33,000

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

The "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" has been developed, reviewed and finalized for endorsement through the process under ASEAN protocol. With incorporation of suggestions made by delegates from Member Countries during 17th Meeting of FCG/ASSP in 2014 and 47th Meeting of the Council Southeast Asian Fisheries Development Center in April 2015, the final draft of the Guidelines was endorsed by 23rd Meeting of the ASEAN Sectoral Working Group on Fisheries (ASWGFi) in June 2015 for consideration of higher level meetings of the ASEAN.

To assist Member Countries to implement the Guidelines, MFRDMD invited relevant government officers and traders for consultation to identify and to compile present status and issues for translation of "the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" to possible practical actions in member Countries. The meeting was held in 11-13 August 2015 in Malaysia and will be further organized in a few Member Countries in 2015.

MFRDMD will invite expertise from member countries and stakeholders to organize Regional Technical Consultation Meeting on implementation of the Guidelines in 1Q 2016. The meeting will identify real situation and difficulty in each member countries in implementation of the Guidelines and discuss possible practical actions in consideration with different circumstances and conditions in each country.

In cooperation with SEAFDEC/Secretariat, MFRDMD facilitated the discussion with Member Countries for a catch documentation system in the region in the 2nd Regional Expert Consultation on ASEAN Catch

Documentation Scheme, 25-27 May 2015, Langkawi, Malaysia. The meeting discussed the 2nd Draft ACDS.

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 Meetings for Effective Program Implementation					
<u>Sub-activity 1.1</u> Core Expert Meetings	P	10	8		0 (CEM will be held in February 2016)
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					
<u>Sub-activity 2.2:</u> Consideration of possible solutions to the problems	I	6	9	1 trader	5,600
Activity 3 Establishment and dissemination of a possible catch documentation scheme in the region					
<u>Sub-activity 3.1</u> Establishment and dissemination of a catch documentation scheme for ASEAN countries	P		6	1	3,000

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
<u>Sub-activity 1.1</u> Core Expert Meetings	The Core Expert Meeting for the establishment of the ASEAN catch documentation scheme	MFRDMD will invite experts from Member Countries and stakeholders to organize Regional Technical Consultation Meeting on implementation of the Guidelines in 1Q 2016. The meeting will identify real situation and difficulty in each member countries in implementation of the Guidelines and discuss possible practical actions in consideration with different circumstances and conditions in each country.
Activity 2		
<u>Sub-activity 2.2</u> Consideration of possible solutions to the problems	Finalization and dissemination of the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain.	MFRDMD invited relevant government officers and traders for consultation to identify and to compile present status and issues for translation of "the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" to possible practical actions. The meeting was held in 11-13 August 2015 in Malaysia.

Planned activity	Expected outcome/output	Achievements
Activity 3		
<u>Sub-activity 3.1</u> Establishment and dissemination of a catch documentation scheme for ASEAN countries	Establishment and dissemination of a catch documentation scheme for ASEAN countries	In cooperation with SEAFDEC Secretariat, MFRDMD facilitated the discussion with Member Countries for a catch documentation system in the region in the 2 nd Regional Expert Consultation on ASEAN Catch Documentation Scheme, 25-27 May 2015, Langkawi, Malaysia. The meeting discussed on the 2 nd Draft ACDS.

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain.	technical report	

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

Planned Activity	Evaluation/ Views from Participants
Activity 1	
<u>Sub-activity 1.1</u>	The Meeting will be held in February 2016.
Activity 2	
<u>Sub-activity 2.2</u>	Malaysian officers from government (Department of Fisheries and Fisheries Development Authority) and a participant from trading company attended to identify and list up current status and possible actions in the country for the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain". The list of current status/possible actions

6. Major Impacts/Issues

Effective coordination of several related programs in relation with combating IUU Fisheries in the ASEAN region should be considered.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

Proposed Activity	Description of Proposed Activity	(Unit: USD)
		Proposed Budget
Activity 2		
<u>Sub-activity 2.2</u> Consideration of possible solutions to the problems	Consultation on the possible solutions associated with implementation of the "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" in each SEAFDEC Member Countries	4,884
Activity 3		
<u>Sub-activity 3.1</u> Establishment and dissemination of a catch documentation scheme for ASEAN countries	Establishment and dissemination of the "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" and a possible catch documentation scheme for ASEAN countries.	8,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 2	
<u>Sub-activity 2.2</u> Consideration of possible solutions to the problems	Suggestions on the solutions in the implementation of the "ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" in each SEAFDEC Member Country.
Activity 3	
<u>Sub-activity 3.1</u> Establishment and dissemination of a catch documentation scheme for ASEAN countries	Strengthening countermeasures to IUU fishing in each SEAFDEC Member Country.

3. Schedule of Activity for the Year 2016

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

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2013010106
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Fisheries Resources Survey and Operational Plan for M.V. SEAFDEC 2		
Program Thrust:	IV	Total Duration:	
Lead Department:	TD	Lead Country:	All AMSs
Donor/Sponsor:	Requesting country/agency	Total Donor Budget:	
Project Partner:		Budget for 2016:	
Project leader:	Document is prepared by Mr. Isara Chanrachkij	Involved Country	

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 the activities as mentioned above, TD works in close collaboration with the Member Countries and other significant partners at national, sub-regional, and regional levels. M.V. SEAFDEC 2 focuses on three major specific areas: (i) fisheries research and training; (ii) oceanographic 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 EEZs 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 fishery research and training vessel – M.V. SEAFDEC 2 for conducting fishery resource and oceanographic surveys and training in coastal ASEAN waters, along with procurement of the requisite fishing gear, fishing machinery, and survey equipment. Subsequently, the construction of a research vessel, M.V. SEAFDEC 2, was completed in 2003. Since 2004, research survey on fisheries stock, exploration of fisheries resources, testing of sampling gears, fishery oceanography, and other activities related to marine capture fisheries were conducted by M.V. SEAFDEC 2 in collaboration with the Member Countries. In a broader sense, the achievement of M.V. SEAFDEC 2 includes strengthened 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 requests 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 cruising 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 result was that sharing of data collected from the cruise survey using M.V. SEAFDEC 2 should be finalized at the planning meeting

prior to 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:	Outcome 1: A set of scientific data from the cruise survey of M.V. SEAFDEC 2 are accurate and useful for fisheries management of SEAFDEC Member Countries	Output 1: A set of scientific data compiles with the land-based survey for better management of shared-stock of oceanic tunas (yellowfin, big-eye, and skipjack) in Sulu and Sulawesi Seas	Activity 1: Tuna Fisheries Resources Survey in Sulu and Sulawesi Seas
		Output 2: A set of scientific data for fisheries management of Malaysia	Activity 2: Demersal Fisheries Resources Survey in Malaysian Waters
		Output 3: Human resource capacity building on fishing operation	Activity 3: Shipboard training on national program on observer onboard program, Thailand

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1	<p>M.V. SEAFDEC 2 Cruise No.48-1/2015 scheduled from 20 March to 13 May 2015. This cruise survey was the second cruise for the Joint Research Program on Tuna Resources Survey in the Sulu and Sulawesi Seas within the EEZ of Indonesia, Malaysia and Philippines. The scope of the survey activities included the following:</p> <ol style="list-style-type: none"> 1. Research on tuna early life history using fish larvae sampling net and Bongo net in the near shore and off shore of the SSSs, in order to determine the relative abundance and species composition of the fish larvae; 2. Oceanographic survey using the Conductivity-Temperature and Depth (CTD) attached with other sensors, namely: pH, DO, Fluorescence, among others; 3. Use of scientific hydro-acoustic during the track survey; and 4. Scanning sonar survey on the FADs, and fish sampling "short" Pelagic longline, Hand line and Trolling line <p>The cruise survey was separated into 3 legs, sixty-two (62) survey stations for oceanographic survey stations and hydro-acoustic tracks. Oceanographic survey that conducted by collecting larvae and plankton, using Bongo net, neuston net, and environment parameters were collected by CTD. FADs in the SSSs had been observed and recorded along the hydro-acoustic tracks. The determination of the species compositions and size of fish caught at FADs using appropriate fishing gear <i>e.g.</i> "short" Pelagic longline, trolling, and hand line fishing was also carried out.</p>
Activity 2	<p>M.V. SEAFDEC 2 Cruise No.50-3/2015 scheduled from 21 July – 23 October 2015. This cruise survey was a national survey of Malaysia on demersal fish stock assessment survey in Sabah, Labuan and Sarawak. The overall goal of the program is to provide updated scientific findings on the status of demersal fisheries resources and marine environment in Malaysian Waters. The survey focused on 1) Demersal species sampling: bottom otter board trawl 2) Oceanographic survey: CTD (water sampling), Bongo (Plankton) net (Phyto-Zoo Plankton sampling), Smith-McIntyre Grab (Sediment sampling), total lipid & fatty acid sampling, petroleum hydro-carbon sampling, Temperature Depth</p>

Activity	Description
	Sensor (TD), and current indicator etc. Numbers of sampling stations and fishing gear survey are as follows: 1) Bottom otter board Trawl: 196 stations 2) Oceanographic survey: 81 stations
Activity 3	Department of Fisheries Thailand requested the service of M.V. SEAFDEC 2 to support shipboard training on national program on observer onboard program during 30 November to 3 December 2015. The overall goal of the program is to enhance human resource capacity on observation on fishing vessel <i>i.e.</i> trawler and longliner. There are 21 trainees attend onboard M.V. SEAFDEC 2. Area of operation is in Eastern Gulf of Thailand, Thailand Waters.

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
Activity 1:	Sub-activity 1.1	Cost sharing basis				
Activity 2:						
	Sub-Total					

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Cruise survey of M.V. SEAFDEC 2 was conducted in collaboration with the participating countries. Course sharing policy was applied that fuel consumption of the vessel for the entire duration of the research/survey including cruising to and back to the requesting country will be responsible by the requested country (s). In single country, Malaysia, cost of operation had been applied from Malaysia governments.

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	R	26	7	-	
Activity 2	R	63	8	-	
Activity 3	R, C	19	3	-	

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1	Data collection of the cruise survey of M.V. SEAFDEC2 under cost-sharing arrangement of the participating countries, namely Indonesia, Malaysia, and the Philippines	Overall results from three survey sub-trips were composed of sixty three (63) oceanographic survey operations by CTD, Bongo net, and Neuston net. Six (6) fishing operations were conducted by “short” Pelagic longline. Sixty two (62) acoustic tracks, approximately 3,231 nm were recorded of fisheries resource abundance by hydro acoustic equipment.
Activity 2	A set of scientific data for demersal fish stock assessment survey in Sabah, Labuan and Sarawak	Overall result from three survey sub-trips were one hundred and ninety-six (196) trawl fishing operations and eighty-one (81) oceanographic survey stations using CTD, Water sampling, Bongo(Plankton) net (Phyto-Zoo Plankton sampling), Smith-McIntyre Grab (Sediment

Planned activity	Expected outcome/output	Achievements
		sampling), total lipid & fatty acid sampling, petroleum hydro-carbon sampling, Temperature Depth Sensor (TD), and current indicator etc.
Activity 3	Staffs of Department of Fisheries Thailand acknowledge and understand the details of trawl and longline fishing operation in relevant with observer onboard.	Overall result of the program is to enhance human resource capacity on observation on fishing vessel <i>i.e.</i> trawler and longliner. There are 21 trainees attend onboard M.V. SEAFDEC 2. Area of operation is in Eastern Gulf of Thailand, Thailand Waters.

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1. Two (2) cruise Reports Research Activities of Joint Research Program for Tuna Research Survey in Sulu-Sulawesi Seas	Hard copies	
2. Cruise Report Research Activities of Demersal Fisheries Resources Survey in Malaysian Waters	Hard copies (Draft)	

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

Planned activity	Evaluation/Views from Participants
Activity 1	Participating countries of the program, namely Indonesia, Philippines, and Malaysia provided an active participation to the series of activities for planning, drafting the survey methods, and others. Results from the survey will be compiled with data collected from land-based survey. Final report of the preliminary results will be shared among the concerns. Sampling methodologies including SOPs for data collection can be used as the regional reference for other sub- or regional waters to implement similar initiatives in the future.
Activity 2	Malaysia has completed the demersal resources demersal fisheries resources survey with active participation from 45 Malaysia scientists. Series of activities 1) Demersal species sampling: bottom otter board trawl 2) Oceanographic survey: CTD (water sampling), Bongo net (Phyto-Zoo Plankton sampling), Smith-McIntyre Grab (Sediment sampling), Total lipid & fatty acid sampling, petroleum hydro-carbon sampling, Temperature Depth Sensor (TD), and current indicator etc were carried out. The numbers of sampling stations and fishing gear survey were as follows: 1) Bottom otter board Trawl: 191 fishing operations 2) Oceanographic survey: 50 operations.
Activity 3	Regarding to the training activity has not yet conducted during the 38 th Program Committee Meeting, the evaluation and view from participants will be reported in 39 th Program Committee Meeting.

6. Major Impacts/Issues

The results from the cruise survey of M.V. SEAFDEC2 both Sulu and Sulawesi Seas and Malaysian Waters are base line information to understand the present fisheries resource situation. As well as the marine environment has been monitored through oceanographic survey. The result for surveys will be consolidated with relevant information in order to formulate appropriated fisheries management both tuna resources in sub-regional area of Sulu and Sulawesi seas and demersal resources in Malaysian Waters.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
National survey of Malaysia on demersal fish stock assessment survey	Department of Fisheries, Malaysia has proposed the utilization of M.V. SEAFDEC 2 on the national survey of Malaysia on demersal fish stock assessment survey in Malaysia Waters during the second week of April to the first week of June 2016. The overall goal of the program is to provide updated scientific findings on the status of demersal fisheries resources and marine environment in Malaysian Waters.	

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1 National survey of Malaysia on demersal fish stock assessment survey	Expected output of the resource survey is to provide updated demersal fisheries resources information on the status of demersal fisheries resources and marine environment in Malaysian Waters.

3. Schedule of Activity for the Year 2016

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

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2013010107
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Offshore Fisheries Resources Exploration in Southeast Asia		
Program Thrust:	IV	Total Duration:	2013 - 2017
Lead Department:	TD	Lead Country:	Viet Nam
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 201,800
Project Partner:	None	Budget for 2016:	USD 37,498
Project leader:	Mr. Sayan Promjinda	Involved Country:	

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Currently, attempts of countries in the Southeast Asia have been made 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 are being shared among the countries in Southeast Asia.

2. Background and Justification

This part includes the problem analysis, baseline data and information (describing the underlying causes of the problem and the present situation), regionality, participation and beneficiaries. It also includes any related and relevant ASEAN-SEAFDEC Resolution, policies and plans of action.

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 stated 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.

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

3.1 Objectives, Outcomes and Outputs of the Project

Objective	Outcomes	Outputs	Activities
Objective 1:	<p>Outcome 1:</p> <ul style="list-style-type: none"> - A set of scientific data for policy consideration on management and sustainable utilization of oceanic tuna in Sulu and Sulawesi Seas - A set of SOPs for assessing the status of tuna resources in region or sub-region waters in Southeast Asia - Utilization of fisheries resources through improvement of post-harvest fish handling at sea onboard fishing vessels. 	<p>Output 1:</p> <ul style="list-style-type: none"> - Report of the preliminary results from the joint program on tuna research in Sulu and Sulawesi Seas - Draft plan for establishment of other sub-regional initiative for offshore fisheries resources exploration - Report of the regional training course on post-harvest 	<p>Activity 1: Organization of the Regional Offshore Fisheries Research Resource Exploration and Human Resource Developing for Improving Fish Handling at Sea</p>
Objective 2:	<p>Outcome 2: Regional references for assessment of stock status of tuna fisheries resources in Southeast Asia</p>	<p>Output 2: Revised SOPs and/or a new SOPs for offshore fisheries resources sampling gears</p>	<p>Activity 2: Modification of the Offshore Sampling Gears and Technical Project Publications</p>
	<p>Outcome 3: Sub-regional scientific findings (on the issue based on the survey conducted)</p>	<p>Output 3: Report of the cruise survey or land-based survey attended by the technical staff of TD in collaboration with the participating countries</p>	<p>Activity 3: Technical Support of TD to the Cruise Survey Technical staff of TD joined the cruise survey and participated to the technical meetings of sub-regional study/research on offshore fisheries resources survey.</p>

3.2 Overall Scope/Description of Project

Activity	Description
<p>Activity 1: Organization of the regional offshore fisheries research resources exploration and Human Resource Developing on Improvement of Post-harvest Fish Handling at sea</p>	<p>Under the Activity 1, three sub-activities will be organized:</p> <p>(i) Two (2) Technical meetings on the results of the 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 2015. Progress of the tuna research work as well as the future improvement of the project activities including land-based and the 2nd cruise survey of M.V. SEAFDEC2 will also be discussed in the meeting.</p> <p>(ii) Regional (or Sub-regional) consultation to establish research survey for offshore fisheries resources in Southeast</p>

Activity	Description
	<p>Asia Waters by utilization of M.V. SEAFDEC 2</p> <p>Regarding, the development of phase-2 activities to be implemented under this project between 2016 and 2017, the project will organize the regional (or sub-regional) consultation.</p> <p>(iii) Regional training course on improvement of fish handling at sea.</p> <p>Regarding last sub-activity, the series of training course on improvement of post-harvest fish handling will be continued for building human resources of the Member Countries on onboard fish handling techniques in order to enhance value addition to marine fishery products.</p>
<p>Activity 2</p> <p>Modification of the offshore sampling gears and technical project publications</p>	<p>In order to strengthen quality 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 to marine fisheries products in Southeast Asian Region, promotional materials including with package(s) of technical handbooks and training reports on improvement of post-harvest fish handling will be disseminated through the project website.</p>
<p>Activity 3</p> <p>Technical support of TD to the cruise survey</p>	<p>The activities support the project on the collaborative research cruise on tuna stock assessment in Sulu and Sulawesi Seas as already planned to be carried out in March 2015. It also includes in supporting technical staff of TD joining the 2nd cruise survey using M.V. SEAFDEC 2 in Sulu and Sulawesi Seas, and other research vessels as well as cruise survey of Koyo-Maru (Training and Research Vessels of the National Fisheries University of Japan) in the EEZ of Southeast Asian Countries.</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
Activity 1:	Sub-activity 1.1			15,000	12,000	15,000
	Sub-activity 1.2		45,900	15,900	3,000	15,900
	Sub-activity 1.3			15,000	15,000	15,000
Activity 2:	Sub-activity 2.1:		1,000	1,000	2,498	1,000
Activity 3	Sub-activity 3.1:		4,000	4,000	5,000	4,000
	Sub-Total Budget		50,900	50,900	37,498	

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the present year

Project has provided 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 in the Sulu and Sulawesi Seas meeting in 2014. Project supported technical staff(s) of TD to participate the cruise survey in Sulu and Sulawesi seas based on the survey planning and arrangement of the cruise in their respective countries. Preliminary Results of the Cruise Survey by M.V. SEAFDEC 2 Cruise No. 47-3/2014 and Cruise No. 48-1/2015 presented Oceanographic parameter, fish sampling for genetic research, result of fishing operation, FADs and

hydroacoustic survey. The Cruise reports were published and disseminated to the participating countries and others.

Project has supported human resource development program on the tuna stock assessment in Sulu and Sulawesi Seas based on historical data and landing data collection. Accepted stock assessment models of relevant RFMO *e.g.* WCPFC and IOTC were disseminated through the tuna stock study of invited resource person. Project also provided platform and maintained the mechanism for sharing data and support information sharing of the research survey in offshore areas of the Member Countries.

Principle and technology of fish handling at sea onboard fishing vessels was disseminated through the regional training course on fish handling techniques applicable to various fishing operation in Southeast Asia. Training courses provided (i) knowledge and skill on environmental/user friendly fish handling tools and simples, (ii) promotion on food safety and minimizing post-harvest loss in catching, storing and transportation process, and (iii) ways forward to improve fish handling in assigned coastal and offshore fisheries cases in Southeast Asian 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					
<u>Sub-activity 1.1</u> Working Groups Meeting and Technical Meeting on Joint Program on Tuna Research in Sulu and Sulawesi Seas	C	12	17	1	8,421
<u>Sub-activity 1.2</u> Regional training course on fish handling technique applicable to various fishing operation in Southeast Asia	T	21	5	2	22,000 (wait for final budget)
<u>Sub-activity 1.3</u> The Second Working Groups Meeting on Joint Program on Tuna Research in Sulu and Sulawesi Seas	C	26	9		17,000 (wait for final budget)
Activity 2					
<u>Sub-activity 2.1</u> Dissemination of the publications of Atlas of Early Stage Fish in Japan	R, T	6	2		1,117
Activity 3					
<u>Sub-activity 3.1</u> Technical support of TD staffs onboard cruise survey M.V.SEAFFDEC 2 No. 48-1/2015 (Survey in SSSs)	P	26	5		4,087
If possible, please put the activity for Koyo-maru					

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
<u>Sub-activity 1.1</u>	- Committed budget of the participating countries sharing for	- Data collection on Tuna from three (3) SSS Member Countries for study on stock

Planned activity	Expected outcome/output	Achievements
	implementing the tuna research program in Sulu and Sulawesi Seas - Cruise plan M.V. SEAFDEC 2 in year 2015 - Progress of the historical data collection and future works for stock assessments - Agreed timeframe of activities in year 2015 for the joint research program on tuna research in SSSs.	assessment of tuna in Sulu and Sulawesi Seas - Agreed on the appropriated stock assessment model for investigate tuna abundance in Sulu and Sulawesi Seas - Plan of the Second Working Group Meeting on Joint Program on Tuna Research in Sulu and Sulawesi Seas - Final cruise plan for research activities in SSSs using M.V. SEAFDEC 2 in the year 2015 adopted by Project's Participating Countries
<u>Sub-activity 1.2</u>	- 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	- Twenty One (21) participants enhance knowledge and practical skills on reduction of post-harvest losses - Strategies/ways forward to improve fish handling in assigned coastal and offshore fisheries cases in Southeast Asia
<u>Sub-activity 1.3</u>	- Progress of project implementation on research topic of tuna stock assessment, tuna spawning ground, Tuna genetic, and Fish Aggregating Devices (FADs) - Technical document of tuna stock assessment in Sulu and Sulawesi Seas - Cruise report of M.V. SEAFDEC 2 on the second joint research survey on tuna research in Sulu and Sulawesi Seas - Future activities to implement Joint Program on Tuna Research in Sulu and Sulawesi Seas	- Draft report (internal used only) 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* - Plan of the Joint Program on Tuna Research in Sulu and Sulawesi Seas in Year 2016-2017 - Cruise report on the first tuna research survey in SSSs using M.V. SEAFDEC 2 from 17 October to 8 December 2015 (Post SW Monsoon) - Cruise report on the second tuna research survey in SSSs using M.V. SEAFDEC 2 from 20 March to 13 May 2015 (Pre SW Monsoon) - Meeting report on the technical meeting and working group meeting
Activity 2		
Dissemination of the publications of Atlas of Early Stage Fish in Japan	Regional reference on identification of early stage fish	Human resource development on the Larvae identification for SEAFDEC Member Countries.
Activity 3		
TD staffs onboard cruise survey M.V. SEAFDEC 2 No. 48-1/2015 from 20 March to 13 May 2015	Facilitated five (5) TD staffs onboard cruise survey M.V. SEAFDEC 2 No. 48-1/2015	M.V. SEAFDEC 2 Cruise Survey on Tuna Research Survey in Sulu and Sulawesi Seas on 20 March – 13 May 2015

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1. Cruise report on the first tuna research survey in SSSs using M.V. SEAFDEC 2 from 17 October to 8 December 2015 (Post SW Monsoon)	Hard Copy	
2. Cruise report on the second tuna research survey in SSSs using M.V. SEAFDEC 2 from 20 March to 13 May 2015 (Pre SW	Hard Copy	

List of completed publications for the year 2015	Type of media	Attached e-file
Monsoon)		
3. Atlas of Early Stage Fish in Japan Provided by Dr. Konishi Yoshinobu	Hard Copy	
4. Report on the Working Groups Meeting and Technical Meeting on Joint Program on Tuna Research in Sulu and Sulawesi Seas	Hard Copy	
5. Draft report (internal used only) 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*	Hard Copy	
6. A series of VDO Clips VDO Clip of the Cruise survey on tuna research survey in SSSs using M.V. SEAFDEC 2 from 17 October to 8 December 2015 (Post SW Monsoon)	VDO Presentation	

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

Planned activity	Evaluation/Views from Participants
Activity 1	
Sub-activity 1.1	<ul style="list-style-type: none"> - Agree on the appropriated stock assessment model for investigate tuna abundance in Sulu and Sulawesi Seas - Member Countries of SSSs agree to support historical data to study on the 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* (A Stock Production Model Incorporating Covariates)
Sub-activity 1.2	<ul style="list-style-type: none"> - Overall subjects of training course is good contents - Participants were satisfied with class session and field trip but 30% of comments are requested more field trip - Training period for 5 days is good but few of participants requested for 10-15 days training period - Training facilities and accommodation is good
Sub-activity 1.3	<ul style="list-style-type: none"> - Participants agree to continue working group on Tuna research in Sulu and Sulawesi Seas and plan of the Joint Program on Tuna Research in Sulu and Sulawesi Seas in Year 2016-2017 - Participants accepted the result of draft report (internal used only) 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*
Activity 2	
Sub-activity 2.1 Dissemination of the publications of Atlas of Early Stage Fish in Japan	<ul style="list-style-type: none"> - Six countries e.g. 1) Cambodia, Indonesia, Malaysia, Philippines Thailand, and Viet Nam received publication and used as reference of fish larvae Identification.
Activity 3	
Sub-activity 3.1	Five (5) TD staffs onboard cruise survey M.V. SEAFDEC 2 No. 48-1/2015

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. Oceanographic data on the nutrient analysis is delayed regarding to the malfunction of Auto Analyzer.

Training Department as Coordinator needs to be strengthened—following up the progress of each topic of research in SSSs.

Training course on the 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 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1	Organization of the regional training course on offshore fisheries resources exploration	30,000
<u>Sub-activity 1.1</u>	Working Groups writeshop to wrap up the result on Joint Program on Tuna Research in Sulu and Sulawesi Seas	(12,000)
<u>Sub-activity 1.2</u>	Follow up on the progress report of research activity on Joint Program on Tuna Research in Sulu and Sulawesi Seas	(3,000)
<u>Sub-activity 1.3</u>	Regional training course on fish handling technique applicable to various fishing operation in Southeast Asia	(15,000)
Activity 2	Modification of the offshore sampling gears and their handbook	2,498
<u>Sub-activity 2.1</u>	Review of the current handbook publications of SEAFDEC/TD related to offshore fisheries resources exploration	
<u>Sub-activity 2.2</u>	Modification for offshore sampling gears	
<u>Sub-activity 2.3</u>	Publication and dissemination of the new/revised handbook of offshore sampling gears	
Activity 3	Technical staffs of TD and Member Countries join the cruise survey	5,000
<u>Sub-activity 3.1</u>	Technical staffs of TD and Member Countries join the cruise survey	
<u>Sub-activity 3.2</u>	Support for developing the survey plan and to monitor the progress of the survey in SEA countries	
<u>Sub-activity 3.3</u>	Technical staffs of TD participate the international symposium to promote result of project Offshore Fisheries Resources Exploration in Southeast Asia	

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1. Organization of the regional training course on offshore fisheries resources exploration	
Sub-activity 1.1	Draft report on the result on Joint Program on Tuna Research in Sulu and Sulawesi Seas
Sub-activity 1.2	Progress report of research activity on Joint Program on Tuna Research in Sulu and Sulawesi Seas
Sub-activity 1.3	Human resource development on the reduction of post-harvest losses which will help reinforce extension and promotion activities in their respective countries
Activity 2. Modification of the offshore sampling gears and their handbook	
Sub-activity 2.1	Compilation and revision of the technical handbook and guideline on sampling gears and survey methodology for offshore fisheries resources exploration will be continued

Proposed Activity	Expected Outcomes/Outputs of Activity
Sub-activity 2.2	Modification for offshore sampling gears
Sub-activity 2.3	Publication and dissemination of the new/revised handbook of offshore sampling gears
Activity 3. Technical staffs of TD and Member Countries join the cruise survey	
Sub-activity 3.1	Technical staffs of TD and Member Countries join the cruise survey <i>e.g.</i> M.V. SEAFDEC 2, T.V. Koyo Maru, and Other National Research Vessel
Sub-activity 3.2	Support survey plan development, monitor and evaluation progress of fisheries resource survey in SEA countries
Sub-activity 3.3	Technical staffs of TD participate the international symposium to promote result of project Offshore Fisheries Resources Exploration in Southeast Asia

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
<u>Sub-activity 1.1</u>								x				
<u>Sub-activity 1.2</u>	x	x	x	x	x							
<u>Sub-activity 1.3</u>			x									
Activity 2												
<u>Sub-activity 2.1</u>	x	x	x	x	x	x	x	x				
<u>Sub-activity 2.2</u>	x	x	x	x	x							
<u>Sub-activity 2.3</u>								x	x	x	x	x
Activity 3												
<u>Sub-activity 3.1</u>										x	x	
<u>Sub-activity 3.2</u>	x	x	x	x	x	x	x	x				
<u>Sub-activity 3.3</u>	x	x	x	x	x	x	x	x	x	x	x	x

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2013010108
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	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		
Program Thrust:	IV	Total Duration:	2013-2017
Lead Department:	TD	Lead Country:	Viet Nam
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 255,000
Project Partner:	None	Budget for 2016:	USD 40,000
Project Leader:	CSFDH/TD	Involved Country	-

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

The project would support Member Countries by reviewing the problems and constraints in fisheries data collection in coastal small-scale and inland fisheries at national level. And, the project identifies the key issues in fisheries data collection that should be addressed by the countries through the regional workshop. Thereafter, the project will support Member Countries by training on site “Facilitating Fisheries Information Gathering Through Introduction of Community-based Resources Management/Co-management”. This on-site training course addresses the concept of Community-based Resources Management/Co-management for Provincial officers of Member Countries. Also, the project will support the monitoring and additional activities by fisheries officers of Member Countries to practice in collecting and analyzing information from fisheries community. In addition, the project will assist to design coastal and inland fishery management plans by using the participatory mechanism of CBRM/Co-management approach that suit the local condition.

2. Background and Justification

Typical characteristic of Inland and coastal fisheries in the Southeast Asia are considered as “targeting multi-species and involving large number of small-scale fishers”. Because of this nature, fishery statistics on these fisheries are recognized as inaccurate or underreported. As fisheries statistics are basis of good fisheries management, it is necessary to improve data and information collection by utilizing suitable methodologies for these fisheries, *i.e.* by involving local communities, local officers, etc. In addition, the data 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, it is necessary for SEAFDEC member countries to carry out the project on “Facilitating fisheries activity information gathering through introduction of Community-based Resources Management/Co-management”.

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

3.1 Objectives, Outcomes, Outputs and Activities of the project

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

3.2 Overall Scope/Description of Project

Activity	Description
1. Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region	Results on 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 is 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
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 is aimed at: Providing clear and detailed concept and methodology on CBRM/Co-management; Cultivation understanding on tools for data and information collection in coastal and inland fishing communities; and Introducing skills for establishment of organizations in the fishing communities to implement CBRM/Co-management. This would include practical planning and implementing the applicable coastal/inland fishery management plans
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 Countries will select a pilot site which promotes CBRM/Co-management approach, and SEAFDEC will assist fisheries officers of Member Countries in collecting and analysing information from fisheries community for policy formulation, and in designing coastal and inland fishery management plans through participatory mechanism of CBRM/Co-management approach, that suit the local condition as well
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

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1: Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region		18,000				18,000
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of CBFM including the methodology on gathering fisheries activity information		34,000	70,000	40,000		
Activity 3: Monitoring and facilitating	Sub-Activity 3.1: Monitoring and additional support for member countries activities of facilitating CBRM/Co-management and gathering fisheries activity information				15,000	
	Sub-Activity 3.2: Study on appropriate activities sustainable for CBFM in fisheries community in Southeast Asia.			17,000	25,000	18,000
	Sub-total	52,000	70,000	57,000	40,000	36,000

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Year 2015

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 2015, SEAFDEC/TD provided Training on Trainers (TOTs) in Lao PDR and Viet Nam, and Follow-up activities in Cambodia and Thailand. These activities have assisted the fisheries officers to introduce CBRM/Co-management with knowledge of fisheries management to community fishers by themselves. These activities have also assisted to design coastal and inland fishery management plans under the appropriate participatory mechanism of co-management approach, that suit to the local condition.

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					
1. TOTs (Training of Trainers) on Facilitating Fisheries Information Gathering through Introduction of CBRM/Co-management in Lao PDR, 27- 30 April 2015, Khammouane Province, Lao PDR	T	35(1 Resource person from DOF Thailand)	7 (6 staffs and RFPN for Lao PDR)		14,000
2. TOT on Facilitating Fisheries Information Gathering: Role and Function of Fishers Organization in the Implementation of CBRM/Co-management in Viet Nam, 12-14 May 2015, Nha Trang City, Khanh Hoa Province, Viet Nam	T	52 (2 Resource persons from Japan and Thailand)	7 (6 staffs and RFPN for Viet Nam)		20,000
Activity 3					
1. Follow-up activities on the current situation related to challenges in implementing/ promoting CBRM/Co-management in Thailand, 22-26 February, and 3-7 August 2015, Nam Oon Dam, Sakon Nakhon Province.	T	200	5	0	8,000
2. Study (Base-line survey) and consultation meeting on clarification of feasible ways for implementation of management measures in Cambodia, 6-8 May 2015, Siem Reap, Cambodia	R	20	5 (4 staffs and RFPN for Cambodia)	0	6,000

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected Outcome/Outputs	Achievement
Activity 2		
1) TOTs on Facilitating Fisheries Information Gathering through Introduction of CBRM/Co-management in Lao PDR, 27-30 April 2015	Extended and introduced the concepts and methodologies on CBRM/Co-management in the region	34 local officers from central part of Lao PDR had better understanding authorities on the importance of sustainable fisheries development through CBRM/Co-management for inland fisheries, especially on the leading role in practicing and transferring knowledge on Co-management for inland fisheries community
2) TOT on Facilitating Fisheries Information		10 National officers and 40 local officers from Coastal area in Viet Nam got knowledge and practical

Planned activity	Expected Outcome/Outputs	Achievement
Gathering through Introduction of CBRM/Co-management in Viet Nam, 12-14 May 2015		experiences. They also got some legal aspects from a view of Co-management/ right-based fisheries management in Viet Nam through experiences from Thailand and Japan
Activity 3		
1) Follow-up activities on the current situation related to challenges in implementing/promoting CBRM/Co-management in Thailand, 22-26 February, and 3-7 August 2015.	Fisheries management through CBRM/Co-management approach strengthened the information dissemination of results of practical models and survey for Member Country	160 Fishers from 16 communities around Nam Oon Dam, Sakon Nakhon Province and 40 local officers had better understand on CBRM/Co-management through improving their own measurement for fisheries management of Nam Oon Dam, such as the Community's sign board which contains the closed season period, existing date for fishing, prohibited fishing gear and conservation zone, etc. Moreover, based on catch data recorded by fishers by using logbook, it showed that the fisheries production and incomes from Nam Oon Dam is huge for them
2) Base-line survey and consultation meeting on clarification of feasible ways for implementation of management measures in Cambodia, 6-8 May 2015		1. The concrete information about issues and challenges for implementation of CBRM/Co-management using real cases of Chong Khneas fishing community, Siem Reap Province has been listed by community fisheries 2. Formulated "Implementation Plan" for improvement of CBRM/Co-management in the community

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1. Report on TOTs on Facilitating Fisheries Information Gathering through Introduction of CBRM/Co-management: Effective Implementation and Extension of the Co-management and CBFM in Lao PDR, 27-30 April 2015, Khammounae Province, Lao PDR	PDF	<Annex 1&2>
2. Report on TOTs on Facilitating Fisheries Information Gathering through Introduction of CBRM/Co-management: Role and Function of Fishers Organization in the Implementation of CBRM/Co-management in Viet Nam, 12-14 May 2015, Nha Trang City, Khanh Hoa Province, Viet Nam	PDF	<Annex 3>
3. Report on Follow-up activities on the current situation related to challenges in implementing/promoting CBRM/Co-management in Thailand, 22-26 February, and 3-7 August 2015, Nam Oon Dam, Sakon Nakhon Province, Thailand	PDF	<Annex 4&5>
4. Report on Base-line survey and consultation meeting on clarification of feasible ways for implementation of management measures in Cambodia, 6-8 May 2015, Siem Reap, Cambodia	PDF	<Annex 6>

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

Planned activity	Evaluation/ Views from Participants
Activity 2 Strengthening training on site to introduce the appropriate participatory mechanism of CBRM/Co-management including the methodology on gathering fisheries activity information	
Activity 3 Monitoring and facilitating	

6. Major impacts/issues

1. In case of TOTs (Training of Trainers), some countries have requested more than one TOTs in their countries with different issues and different area. Firstly, the project planned to hold only one TOT in a Member Country. But Lao PDR requested that they needed to arrange TOTs for the whole country (Northern, Central and Southern parts). Viet Nam also requested that they needed to arrange TOTs with different issues in each part of country.
2. In case of MOT (Mobile on-site Training), the Project planned to arrange MOT after TOT in each country, and this training would be organized by Member Country. SEAFDEC's staffs will be facilitators. But in some countries, they found difficulties to organize MOT. They needed more knowledge and practical experiences to organize MOT by themselves. In this reason, project have cancelled MOT in 2015.
3. In case of Monitoring and Facilitation, the key problems is human resources and financial support to keep monitoring and facilitating the implementation plan

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-Activity, Workplan and Estimated Budget for the Year 2016

Proposed Activity	Description of Proposed Activity	Proposed Budget
Sub-Activity 3.1: Monitoring and additional support for member countries activities of facilitating CBRM/Co-management and gathering fisheries activity information	SEAFDEC assists fisheries officers in collecting and analysing information from fisheries community for policy formulation, as well as in designing coastal and inland fishery management plans through participatory mechanism of CBRM/Co-management approach, that suit the local condition.	15,000
Sub-Activity 3.2: Study on appropriate activities to be sustainable for CBRM/Co-management in fisheries community in 3 countries	SEAFDEC assists Member Countries in promoting CBRM/Co-management and building the capacity of the fisheries community.	25,000

2. Expected Outcomes/Outputs of Activity for the year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 3	
<u>Sub-Activity 3.1</u> Monitoring and additional support for member countries activities of facilitating CBRM/Co-management and gathering fisheries activity information	- Strengthen practical aspects in competence in planning and implementing the applicable management plans for fisheries community
<u>Sub-Activity 3.2</u> Study on appropriate activities to be sustainable for CBRM/Co-management in fisheries community in 3 countries	- Development pilot site with monitoring, evaluation, and consultation between fisheries officers and fisheries community

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 3												
Sub-Activity 3.1: Monitoring and additional support	X	X	X	X	X	X						
Sub-Activity 3.2: Study on appropriate activities to be sustainable for CBRM/Co-management in 3 countries						X	X	X	X	X	X	X

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

Project id: 2013010108

Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Enhancing compilation and utilization of fishery statistics and information for sustainable development and management of fisheries in Southeast Asian region: Improving the data collection of the commercially-exploited aquatic species and threatened species		
Program Thrust:	IV	Total Duration:	2013 - 2017
Lead Department:	TD	Lead Country:	Viet Nam
Donor/Sponsor:	Japanese Trust Fund-6	Total Donor Budget:	USD 158,000
Project Partner:	MFRDMD	Budget for 2016:	USD 30,000
Project leader:	FGFOS of TD/CFTD Mr. Sukchai Arnupapboon	Involved Country	SEAFDEC Member Countries**

* FGFOS; Fishing Ground and Fisheries Oceanography Section

** Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, Viet Nam,

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

In order to address fisheries international related issues, this program is aimed to enhance capability of fishery sectors in compiling and utilizing fishery statistics and information. The focus of the project is given to improve data collection for the commercially-exploited aquatic and threaten species: sharks.

Generally, primary goals of collecting fishery statistic are to obtain the information to manage fisheries. Trend and status of commercially aquatic species provides useful and important information for fishery management. This information can come from various sources, including the monitoring of the fishing activities (*e.g.* landing, catch and effort data), biological surveys, and information from resource users. Poor capture fishery statistics in Southeast Asian Countries has led to difficulty in managing sustainably their coastal and marine fisheries resources. In particular to the species listed by CITES that will impact to the fisheries sectors of the countries in the region.

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 outputs from the series of events, including the technical meetings in Thailand in 2011 and 2012 organized by TD, and the regional training course on sharks species identification organized by MFRDMD in early 2012. The outputs from these showed that information on sharks stock status in Southeast Asian Countries has yet reliable. The dearth of information on stock structure, abundance, life history, and reproductive capacity of major marine and freshwater sharks species treat sharks as a separate statistical data. Moreover, insufficient policy and financial support on research and management of sharks is commonly the key issues in the region¹. This project aims at continuing the support the member countries to improve quality and timeliness of data/information on sharks.

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

¹ SEAFDEC. 2011. Report of the Special Meeting on Sharks Information Collection in Southeast Asia, Bangkok, 15-17 September 2011. TD/RP/156

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. Project management of administrative, financial and Monitoring & Evaluation have been agreed by all Members.

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: Capacity of the countries to identify shark up to species level	Output 1: Work plan for data collection at the selected sites in the participating countries	Activity 1: Human resource development programs
Objective 2:	Outcome 2: A set of recommendations for improving management of shark fisheries in participating countries	Output 2: Set of data collected on shark landing at the selected sites	Activity 2: Data collection
Objective 3:	Outcome 3: Effective implementation of the NPOA-sharks in the participating countries	Output 3: 1. National reports of shark landing 2. Regional analysis of the shark landing in the participating countries	Activity 3: Information Dissemination

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1 Human resource development programs	To follow up the activity of shark data collection, the project will organize the meeting of mid-term data collection. The participating countries will report the progress of shark data collection. In addition, sharing of problems during first half of data collection will also be made. All countries can share experience in this meeting to improve collecting activity for last half of data collection. National focal point from SEAFDEC Member Countries with the technical supports from resource persons of TD in collaboration with MFRDMD will be invited to the mid-term meeting. To comprehend summary of regional shark data and develop the mechanism of collecting method for long-term period, the Member Countries will report comprehensive summary about shark data collection and provide recommendations for improving the mechanism of data collecting method and mechanism toward regionalization. Next year

Activity	Description
	activities of data collection (2016) will be planned based on the final meeting. Moreover, capacity building within countries will be also encouraged where appropriate.
Activity 2 Data collection	To ensure that the implementation of shark landing data is systematically collected, the periodical monitoring and evaluation by project staff will be carried out.
Activity 3 Information dissemination	This activity aims to collaborate 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 staff in the regional experts meeting, and information collection activity through the discussion and meeting with relevant initiatives

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
Activity 1:	Sub-activity 1.1	27,000	27,000	27,000	22,000	27,000
	Sub-activity 1.2	4,000	4,000	4,000	4,000	4,000
Activity 2:	Sub-activity 2.1:	-				
Activity 3	Sub-activity 3.1:	1,000	1,000	1,000	1,000	1,000
	Sub-activity 3.2:				3,000	
	Sub-Total Budget	32,000	32,000	32,000	30,000	32,000

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

Seven (7) 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. Project management of administrative, financial and Monitoring & Evaluation have been agreed by all Members. Project implementation has been initiated by collaboration between MFRDMD, SEC and TD through the Onsite Training and Verifying Shark data Collection in seven (7) Participating Countries. SEAFDEC established communication network for shark data collection and database system through website and application.

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					
<u>Sub-activity 1.1</u> Planning meeting with the participating countries	I	25	10	1	20,559.25
<u>Sub-activity 1.2</u> Monitoring of data collection	I	-	2		-
<u>Sub-activity 1.3</u> Participation of project staff and focal point in relevant meeting/workshop		68	2		-
Activity 2. Data collection	I	12	6		-
Activity 3. Information dissemination	I	68	6		-

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Human resource development programs		
<u>Sub-activity 1.1</u> Planning meeting with the participating countries	Work plan for data collection at the selected sites in the Participating Countries	1. Work plan for data collection in the participating countries developed in consultation with the project staff 2. Standard Operational Procedure (SOP) of shark and ray data collection
<u>Sub-activity 1.2</u> Monitoring of data collection	Certify local enumerators	1. Onsite trainings on shark species identification for local enumerators in each participating countries organized
Activity 2 Data collection		
<u>Sub-activity 2.1</u> Data collection	Set of data collected on shark landing at the selected sites	The national data set validated by the project advisor
Activity 3 Information dissemination		
<u>Sub-activity 3.1</u> Information dissemination		1. Support Core Expert Meeting on Sharks and Rays in Southeast Asian Waters 3 - 4 March 2015 Kuala Lumpur, Malaysia 2. In coordination with CITES, tool for support shark data collection will be produced and distributed

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1. Report on the Regional Technical Meeting on Shark and Ray Data Collection and Project Planning Year 2015-2016	Hard Copy	To be uploaded on SEAFDEC Website
2. Standard Operational Procedure (SOP) of shark and ray data collection	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	
<u>Sub-activity 1.1</u> Planning meeting with the participating countries	With guidance from project advisors, Project Participating Countries can develop the work planning and identify the major shark landing sites. All Participating Countries accepted the Standard Operational Procedure (SOP) of shark and ray data collection developed by regional shark experts. Where the national work plan for data collection on shark landing will be well developed and implemented, the trial considerations on the issues to be solved in developing NDFs will be carried out.
<u>Sub-activity 1.2</u> Monitoring of data collection	Resource persons from MFRDMD and Expert group in Southeast Asia could transfer knowledge on shark species identification, especially on the species listed by CITES to all enumerator of Project Participating Countries.
Activity 2 Data collection	
<u>Sub-activity 2.1</u> Data collection	Human resource capacity of the shark data collection of Participating Countries in Southeast Asian region has been well developed for identifying shark up to species level.
Activity 3 Information dissemination	
<u>Sub-activity 3.1</u> Information dissemination	Drafted Standard Operational Procedure (SOP) of shark and ray data collection and Reports of Regional Meeting on shark data collection will be published and disseminated to other Member Countries and relevant organizations.

6. Major Impacts/Issues

The final products of the project implementation include 1-year data set of shark landing in the pilot sites, and set of policy recommendations for effectively implementation of NPOA-sharks in the participating countries. Common understanding in SEAFDEC Member Countries should be revisited and acknowledge before CITES CoP17 in September 2016.

Project issue is the accuracy in shark data collection that needs to frequently verify. To set up the expert working group, project needs support the development of the national shark expert(s) in the country level. As for long-term management of shark fisheries in the region, there is a need to establish a mechanism for routine data collection in the member countries

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1 Human resource development programs		
<u>Sub-activity 1.1</u> Meeting on Sharks and Rays Data Collection and Preparation for the CITES CoP17	To follow-up the shark data collection conducted in year 2015-2016, Project-End-Meeting on Sharks and Rays Data Collection and Preparation for the CITES COP17, will be organized in June 2016. The participating countries will report the result of shark data collection and problems during collecting period and way forward on national shark data collection	22,000
<u>Sub-activity 1.2</u> Monitoring of data collection	Project will provide the supports for shark experts or project staff to monitor shark data collection at the pilot sites landing in the participating countries	4,000
Activity 2 Data collection	Shark data collection at the selected landing sites (<i>i.e.</i> catch and some biological data as discussed during the meeting in 2014) will be regularly collected from July 2015 to October 2016	-
Activity 3 Information dissemination		
<u>Sub-activity 3.1</u> Information dissemination	Reports of national shark data collection will be published and disseminated to other Member Countries and relevant organizations	1,000
<u>Sub-activity 3.2</u> Participate Relevant Regional and International Forum	In order to monitor on the current issues that significant to sustainable utilization of sharks, responsible researcher of SEAFDEC will participate the regional/international forums <i>e.g.</i> WCPFC, IOTC and etc.	3,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1 Human resource development programs	
<u>Sub-activity 1.1</u> Meeting on Sharks and Rays Data Collection and Preparation for the CITES CoP 17	1. Draft final report on Sharks and Rays Data Collection 2015-2016 and Preparation Plan for the CITES CoP 17 2. Identify way forward in CITES CoP 17 preparation 3. Identify way forward and need assessment on national shark data collection in Participating Countries after year 2016
<u>Sub-activity 1.2</u> Monitoring of data collection	4. Follow up the development of NPOA in SEAFDEC Member Countries
Activity 2 Data collection	Data collection at the selected pilot sites will be continued under cost-sharing basis as well as the financial support from other source(s)
Activity 3 Information dissemination	
<u>Sub-activity 3.1</u> Information dissemination	1. Reports of national shark data collection 2. Shark identification material(s)

Proposed Activity	Expected Outcomes/Outputs of Activity
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 presented in Meeting on Sharks and Rays Data Collection and Preparation for the CITES CoP17

3. Schedule of Activity for the Year 2016

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

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 01201308
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	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		
Program Thrust:	IV	Total Duration:	2013 - 2017
Lead Department:	TD/Secretariat	Lead Country:	Viet Nam
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 29,840 (5-year)
Project Partner:	-	Budget for 2016:	USD 5,700
Project leader:	Nualanong Tongdee	Involved Country	

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 1978, 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 40th Meeting, and subsequently at the 16th 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, Outcomes and Outputs of the Project

Objectives	Outcomes	Outputs	Activity
Objective 1: To improve compilation of fishery statistics	Outcome 1: Improved understanding of Southeast Asian	Output 1: Strengthened coordination between SEAFDEC and	Activity 1: Coordination of work and participation in the relevant

Objectives	Outcomes	Outputs	Activity
from countries in the region	countries on harmonized requirements for compilation of regional statistics	Member Countries and relevant organizations on statistics-related matters	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	0	0
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
Total	7,000	5,740	5,700	5,700	5,700

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the 2015

In 2015, SEAFDEC continued coordination with Member Countries and relevant organizations to support submission of national statistics for regional/international compilation. The publication entitled “List of Aquatic Animals and Plants in Southeast Asia” was disseminated to Member Countries, aiming to

enhance reporting of statistics to SEAFDEC at more detailed species level. Furthermore, the preparation of Publication on Southeast Asian State of Fisheries and Aquaculture (SEASOFIA) also started at the end of 2015 with the participation of SEAFDEC Departments to the 16th SEAFDEC Information Staff Program (ISP) Meeting to develop draft structure and agree on required inputs for the publication.

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	O	-	-	-	-
Activity 2. Preparation/dissemination of materials to support the collection/reporting of statistics	O	-	-	-	-
Activity 3. Preparation of publication on Southeast Asian State of Fisheries and Aquaculture (SEASOFIA)	O				
3.1 Development of structure and inputs for SEASOFIA (at 16 th ISP Meeting)	I	-	6	-	5,380 (Estimated)

3. Achievements and Expected Outcomes/Outputs of the Activity

Planned Activity	Expected Outcome/Output	Achievement
Activity 3. Preparation of publication on Southeast Asian State of Fisheries and Aquaculture (SEASOFIA)		
3.1 Development of structure and inputs for SEASOFIA (at 16 th ISP Meeting)	Draft structure and required inputs for SEASOFIA	Draft structure and required inputs for SEASOFIA developed at the 16 th ISP Meeting

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
-	-	-

5. Major Impacts/Issues

- More reliable and complete statistics data could be submitted from Southeast Asian countries. Nevertheless, the availability of statistics from respective countries is depended on the capacity of the countries to collect and provide data to SEAFDEC. Data sometimes are available from other sources (*i.e.* other Departments) or in national languages, resulting in difficulties for consolidation.
- Concerned officers of SEAFDEC are encouraged to make use of findings from project implementation and other sources of information to generate information on status and trends of fisheries and aquaculture to serve as basis to support sustainable management of fisheries.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Sub-Activity	Description of Proposed Activity/Outputs	Proposed Budget
Activity 1 Coordination of work and participation in the Consultations/Meetings of relevant projects	SEAFDEC will continue 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.	0
Activity 3 Production of publication on Southeast Asian State of Fisheries and Aquaculture: Preparation of outline 3.2 Preparation of inputs for SEASOFIA 2017	Based on the structure of SEASOFIA as agreed at the 16 th ISP Meeting, SEAFDEC Secretariat and Departments will continue to prepare inputs for the publication. The draft publication is expected to be available by the end of 2016 for publishing in early 2017.	5,700

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1. Coordination of work and participation in the Consultations/Meetings of relevant projects	Strengthening 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 3. Production of publication on Southeast Asian State of Fisheries and Aquaculture: Preparation of outline 3.2 Preparation of inputs for SEASOFIA 2017	The draft publication on Southeast Asian State of Fisheries and Aquaculture is expected to be available by the end of 2016.

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1. Coordination of work and participation in the Consultations/Meetings of relevant projects	(As and when necessary)											
Activity 3. Production of publication on Southeast Asian State of Fisheries and Aquaculture 3.2 Preparation of inputs for SEASOFIA 2017	x	x	x	x	x	x	x	x	x	x	x	x

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2013040102
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region		
Program Thrust:	IV	Total Duration:	2013 - 2017
Lead Department:	MFRDMD	Lead Country:	Philippines
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 247,977
Project Partner:	TD, Secretariat	Budget for 2016:	USD 40,972
Project leader:	Raja Bidin bin Raja Hassan	Involved Country	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 tons of *Rastrelliger* spp., 700,000 tons of *Decapterus* spp. and 800,000 tons of *Sardinella* spp. were captured in the region. Besides food resources, capture fisheries targeting these fishes are of fundamental importance to this region in terms of employment and livelihood of fishers. Purse seine is one of the major fishing gears to catch those small pelagic fishes. However, management of purse seine fisheries is still neglected because information of stocks is 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 improved.	Output 5: Core Expert Meeting/Workshop is held for effective program implementation	Activity 3. Meetings for Effective Program Implementation 3.1 Core Expert Meeting/Workshop

Objective	Outcomes	Outputs	Activities
		Output 6: Recommendation for management 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 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, and 2017 will discuss on the planning and progress of Activity 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 Activity 1-3, a terminal report will be published and recommendation will be made for sustainable purse seine fisheries in the Southeast Asian region based on available data.

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
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	
Activity 2 Genetic Data Collection and	Sub-activity 2.1: Equipment preparation for genetic study	15,000				

Analysis	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					3,000
Activity 3: Meetings for Effective Program Implementation	Sub-activity 3.1: Core Expert Meeting/Workshop		30,394		25,000	30,394
Activity 4 Recommendation for Purse Seine Fisheries Management in the Southeast Asian region	Sub-activity 4.1: Recommendation for fisheries Management					2,578
	Sub-activity 4.2: Preparation and publishing of terminal report					5,000
Sub-Total Budget		60,000	58,260	40,972	47,773	40,972

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

"The Current Status of Purse Seine Fisheries in Southeast Asian Region" was published as an output of 2 years activities of this project. The report provides detail information on catch, effort and type of fishing gears used for catching pelagic fishes in this region, especially on the commercial fleets of the purse seine fisheries to further assess possibilities for implementation of the Total Allowable Catch (TAC) system. Also this report involves compilation and comparison of catch per unit effort (CPUE) where data are available for the last three decades in the region, the genetic study of commercially important pelagic species, and construction of management strategies for sustainable purse seine fisheries in the Southeast Asian region.

Genetic study of *Amblygaster sirm* has been continued for small pelagic fish targeted by purse seine fishery to consider appropriate management of purse seine fishery in the region. MFRDMD and Member Countries are collecting tissue samples from *A. sirm* according to the SOP which was agreed in the Core Expert Meeting in 2014. 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. MFRDMD will visit several member countries, which have difficulties in species identification of *A. sirm*, and conduct on-site training (schedule under discussion).

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 Comparative Studies for CPUE and TAC					
Sub-activity 1.2 Suitable CPUE and other indicators for resource levels in member countries	R	8	3		4,000
Sub-activity 1.3 Comparison of TAC systems in the world	R	8	5		0

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 2 Genetic Data Collection and Analysis					
<u>Sub-activity 2.2</u> Sample collection	R	8	3		6,000
<u>Sub-activity 2.3</u> Genetic study	R		2		3,000

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
<u>Sub-activity 1.2</u> Suitable CPUE and other indicators for resource levels in member countries	Suitable stock indicators in the selected member countries based on data analysis for the last five years.	MFRDMD continuously examined purse seine fishery data to choose suitable stock indicator in the selected member countries. MFRDMD published the report "The Current Status of Purse Seine Fisheries in Southeast Asian Region". MFRDMD will collect information on fishing capacity for purse seine fishery from Member Countries.
<u>Sub-activity 1.3</u> Comparison of TAC systems in the world	Comparison of TAC systems and management measures for purse seine fishery	MFRDMD continuously compared different TAC systems in the world to examine which TAC system is applicable for management of fishery resources in the region. MFRDMD also studies the concept of total allowable effort (TAE) and its possible applicable approach for management of purse seine fishery in the region.
Activity 2		
<u>Sub-activity 2.2</u> Sample collection	Sample collection of spotted sardinella (<i>Amblygaster sirm</i>) for the genetic study	<i>Amblygaster sirm</i> was chosen for the genetic study of a pelagic species in the South China Sea and Andaman Sea. Participating member countries and/or MFRDMD collected reasonable number of specimens. Each specimen was photographed and tissue samples for the DNA study was shipped to MFRDMD according to the sampling procedures determined at the Core Expert Meeting in 2014. MFRDMD will visit several member countries, which have difficulties in species identification of <i>A. sirm</i> , and conduct on-site training (schedule under discussion).
<u>Sub-activity 2.3</u> Genetic study	Preliminary genetic analysis of spotted sardinella (<i>Amblygaster sirm</i>).	Dissection of fish and DNA extraction will follow the standard operational procedures by SEAFDEC/MFRDMD. DNA was extracted the collected tissue samples and analyzed for population structure. DNA markers determined at the Core Expert Meeting in August 2014 was used for the genetic study

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
The Current Status of Purse Seine Fisheries in Southeast Asian Region	Technical report	

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

Planned activity	Evaluation/ Views from Participants
Activity 2	
Sub-activity 2.2	The schedule of on-site trainings is under discussion

6. Major Impacts/Issues

For genetic study of *Amblygaster sirm*, some samples sent from Member Countries were not *A. sirm*, showing that some Member Countries still have difficulties in species identification of small pelagic species. MFRDMD plans to conduct on-site training in such Member Countries.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
<u>Sub-activity 1.2</u> Suitable CPUE and other indicators for resource levels in member countries	MFRDMD will examine and finalize the most current purse seine fishery data to generate suitable stock indicator in the selected member countries. MFRDMD will concentrate on data processing and analysis for the last five years in the region.	6,500
<u>Sub-activity 1.3</u> Comparison of TAC systems in the world	SEAFDEC/MFRDMD will continue to compare different TAC systems in the world to examine which TAC system is applicable for management of fishery resources in the region. TAC comparisons will include systems in Japan, Norway and other countries. Beside that MFRDMD intends to clarify pros and cons of each system with/without individual catch quotas and further study on Total effort Allowances as recommended during the SEAFDEC Council Meeting in 2015.	6,500
Activity 2		
<u>Sub-activity 2.3</u> Genetic study	SEAFDEC/MFRDMD will continue on DNA data analyses for <i>Amblygaster sirm</i> to cover the whole Southeast Asian region and Andaman Sea. This activity will lead to identification of small pelagic population structure.	9,773
Activity 3		
<u>Sub-activity 3.1</u> Core Expert Meeting/Workshop	MFRDMD will organized a Core Expert Meeting to further discuss on the result of genetic study and update with the current status of small pelagic fishery in the South China Sea and Andaman Sea. Two representatives from each participating countries will be invited to attend the CEM which scheduled in August 2016.	25,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
<u>Sub-activity 1.2</u> Suitable CPUE and other indicators for resource levels in member countries	Compilation of the most current purse seine fishery data to generate suitable stock indicator in the selected member countries.

Proposed Activity	Expected Outcomes/Outputs of Activity
<u>Sub-activity 1.3</u> Comparison of TAC systems in the world	Suggestion to the SEAFDEC member countries regarding suitable TAC and TAE systems for purse seine fisheries in the region.
Activity 2	
<u>Sub-activity 2.3</u> Genetic study	DNA information of shared target species of purse seine fisheries in the region.
Activity 3	
<u>Sub-activity 3.1</u> Core Expert Meeting/Workshop	Wrap up of the activities in this project and way forward of this project.

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
<u>Sub-activity 1.2</u> Suitable CPUE and other indicators for resource levels in member countries												
<u>Sub-activity 1.3</u> Comparison of TAC systems in the world												
Activity 2												
<u>Sub-activity 2.3</u> Genetic study												
Activity 3												
<u>Sub-activity 3.1</u> Core Expert Meeting/Workshop												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2015040103
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region		
Program Thrust:	IV	Total Duration:	2015 - 2019
Lead Department:	MFRDMD	Lead Country:	Indonesia
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 211,077
Project Partner:	TD, Secretariat	Budget for 2016:	USD 35,909
Project leader:	Dr. Ahmad Ali	Involved Country	Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Recently, on a regional level the pressure to list commercially captured shark and ray species on CITES is growing. Therefore, governments need to collect data on these species and to prepare management plans when needed. Identification of elasmobranchs (sharks & rays) species is fundamental of data collection and law enforcement related to CITES. Expertise on identification and biological data collection on sharks and rays in the region needs to be strengthened. In addition, information on utilization of by-catch sharks and rays will be collected and compiled in order to enhance understanding on the importance of sharks and rays in the Southeast Asian region and necessity of fisheries management measures.

2. Background and Justification

About 126 thousand tons of sharks and rays were captured in 2009 in Southeast Asia. High demands for shark fin in Asia raise a concern about shark populations. In 1998, FAO proposed International Plan of Action for the Conservation and Management of Sharks (IPOA-SHARKS) corresponds to increase of shark catch. SEAFDEC conducted the basic study of sharks in the ASEAN region in 2003-2004. Species composition and landing were available for one year at major ports in Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Viet Nam. Because of workshops on taxonomy and identification of sharks and rays by SEAFDEC in 2012 and 2014 and publications of three field guidebooks in 2012, 2013 and 2014, data collection on sharks and rays in the region is improving. However, fisheries data in sharks and rays are still insufficient in many Member Countries. On a regional level the pressure to list commercially important and valuable marine species on CITES is growing. Therefore, governments need to collect data on these species and to prepare management plans. Identification of elasmobranch species is fundamental of biological data collection. Expertise on identification and biological data collection on sharks and rays in the region need to be strengthened. Recognition of fully utilized by-catch sharks and rays by a socio-economic study is necessary in the region. Information on utilization of by-catch sharks and rays will improve fishery management in the region.

These activities correspond to 2011 Resolution (No. 10: Strengthen knowledge/science-based development and management of fisheries through enhancing the national capacity in the collection and sharing of fisheries data and information) and Plan of Action (No.4: Enhance regional fishery information systems and mechanisms to facilitate sharing, exchange and compilation of statistics and information that are required at the sub-regional and regional level and apply, where appropriate, regionally standardized definitions and classifications for statistical data to facilitate regional compilation, analysis and data

exchange; No. 76: Increase participation and involvement of Member Countries in international fora and technical committees such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); Codex Alimentarius Commission; Food and Agriculture Organization of the United Nations (FAO); Office International des Epizooties (OIE); Regional Fisheries Bodies (RFBs); and World Trade Organization (WTO); and promote ASEAN interest, recognizing that fisheries policies of relevance to the ASEAN region are increasingly discussed and agreed upon at the global level.) at the ASEAN-SEAFDEC Conference.

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

3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
Objective 1: To train technical officers in the participating Member Countries to be able to collect taxonomic and biological data on sharks and rays in their countries	Outcome 1: Improved landing data collection on sharks and rays	Output 1: Taxonomic information of sharks and rays in the region	Activity 1: Identification of Sharks and Rays in the Southeast Asian Region 1.1 On-site training and data collection in the region 1.2 Workshops on identification of sharks and rays and Core Expert Meeting on Sharks Data Collection in the region
Objective 2: To obtain/summarize genetic information for shark and ray species identification in the region by DNA bar-coding	Outcome 2: Improved customs inspection	Output 2: Genetic information for sharks and rays species identification in the region has been obtained/ summarized by DNA bar-coding.	Activity 1: Identification of Sharks and Rays in the Southeast Asian Region 1.3 Identification of shark and ray species by DNA bar-coding
Objective 3: To collect information on utilization of sharks and rays in the region for proper fishery management and sustainable utilization	Outcome 3: Improved fishery management on sharks and rays	Output 3: socio-economic 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.

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

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 1: Identification of Sharks and Rays in the Southeast Asian Region	Sub-activity 1.1 On-site training in the region	18,400		18,400		
	Sub-activity 1.2 Workshops on identification of sharks and rays in the region		25,909			33,792
	Sub-activity 1.3: Identification of shark and ray species by DNA bar- coding	18,900	10,000	18,900	10,000	10,000
Activity 2: Utilization of By- catch Sharks and Rays	Sub-activity 2.1: County visits	6,492		6,492		
	Sub-activity 2.2: Summarization and publication				5,666	
	Sub-activity 2.3: Core Expert Meeting				28,126	
Sub-Total Budget		43,792	35,909	43,792	43,792	43,792

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

This project started this year. MFRDMD visited Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam to assist data collection on sharks and rays. On-site trainings were conducted in the above countries to identify problems associated with identification of sharks and rays at selected landing sites. Socio-economic information on by-catch sharks and rays were also collected. Genetic samples of sharks and rays were collected for bar-coding research, and 61 samples of sharks and 57 samples of rays were analyzed.

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					
<u>Sub-activity 1.1</u> On-site training in the region	T	14 (2 from each MCs)	2 from MFRDMD		0 (Will be started from September 2015)
<u>Sub-activity 1.3</u> Identification of shark and ray species by DNA bar-coding	R	7 (1 from each MCs)	2 from MFRDMD		5,000
Activity 2 Utilization of By-catch Sharks and Rays					
<u>Sub-activity 2.1</u> County visits	I	4 (1 from each MCs)	2 from MFRDMD		0 (Will be started from September 2015)

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
<u>Sub-activity 1.1</u> On-site training in the region	Trained staffs are able to make the right and valid identification of species at landing site during data collection activities.	MFRDMD visited Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam (not implemented yet, will be started from September 2015) to assist data collection on sharks and rays. On-site trainings were conducted in the above countries to identify problems associated with identification of sharks and rays at selected landing sites.
<u>Sub-activity 1.3</u> Identification of shark and ray species by DNA bar-coding	Genetic information for sharks and rays species identification in the region has been obtained/summarized by DNA bar-coding	MFRDMD and SEAFDEC member countries collected genetic samples of sharks and rays to conduct bar-coding research which is progressing in the world. MFRDMD visited Sandakan, Mukah, and Perak (Malaysia) to collect tissue samples. MFRDMD analyzed 61 samples of sharks and 57 samples of rays. Fifteen species of sharks and 17 species of rays were identified.
Activity 2		
<u>Sub-activity 2.1</u> County visits	Information and utilization of sharks and rays in member countries compiled.	MFRDMD visited Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam (not implemented yet, will be started from September 2015) to collect socio-economic information on by-catch sharks and rays. Local fishery officers and external experts in this field assisted this activity. Collected information will be used for better fishery management of sharks and rays in the region

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1. Ahmad Ali, Annie Lim Pek Khiok, Fahmi, Dharmadi & Tassapon Krajangdara. 2015. Diversity and look-alike species of sharks and rays in the Southeast Asian waters. Paper presented at the Core Expert Meeting on Sharks and Rays in Southeast Asian Waters”, 3-4 Mac 2015 at Quality Hotel, Kuala Lumpur.	presentation file	
2. Wahidah Mohd Arshaad, Ahmad Ali & Adam Luke Pugas. 2015. Genetic species identification of sharks and rays at the JTF5 project in 2013-14. Paper presented at the Core Expert Meeting on Sharks and Rays in Southeast Asian Waters”, 3-4 Mac 2015 at Quality Hotel, Kuala Lumpur.	presentation file	
3. SOP on the Data Collection of Sharks and Rays in the Southeast Asian Region. (Draft ready for comment and suggestion)	printed document	
4. Ahmad, A. 2015. Knowledge experience and lesson learnt in reviewing of non-detriment findings (NDFs) of Scallop hammerhead (<i>Sphyrna lewini</i>) in Malaysia. Paper presented at Regional Technical Meeting on Sharks and Rays Data Collection and Project Planning Year 2015-2016 26-28 May 2015, Bangkok, Thailand.	presentation file	
5. Ahmad, A. 2015. Introduction on Standard Operation Procedure (SOP) of Sharks and Rays Data Collection in the Southeast Asian Waters. Paper presented at Regional Technical Meeting on Sharks and Rays Data Collection and Project Planning Year 2015-2016 26-28 May 2015, Bangkok, Thailand.	presentation file	

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1	On-site trainings will be started from September 2015

6. Major Impacts/Issues

On-site Trainings for species identification of sharks and rays will be started in the third quarter of the year. All planned activities will be completed as proposed.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
<u>Sub-activity 1.2</u> Workshop on identification of sharks and rays and data collection in the region	Workshop will be held to assist and to improve skills for Member Countries on the identification of common and CITES listed sharks and rays species found in this region. Participants will also discuss the selection of fishing vessel, recording landing data at the jetty and analyzing of the data	25,909
<u>Sub-activity 1.3</u> Identification of shark and ray species by DNA bar-coding	Continuously, tissue sample from sharks and rays will be taken at landing sites. Enumerators will be trained to improve the technique to collect sample and preserve the tissue. All sample will be analyzed at MFRDMD DNA laboratory for bar-coding and the results will be presented during the Workshop..	10,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
<u>Sub-activity 1.2</u> Workshop on identification of sharks and rays and data collection in the region	Expertise on species identification of sharks and rays in some Member Countries will be increased through Workshops on identification of sharks and rays in the region. A Proceeding of workshop on identification of sharks and rays and data collection in the region will be published.
<u>Sub-activity 1.3</u> Identification of shark and ray species by DNA bar-coding	Additional bar-coding analyses for sharks and rays in the region will be conducted and a progress report will be presented at the Workshop

3. Schedule of Activity for the Year 2016

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

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2013060101
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Assistance for Capacity Building in the Region to Address International Fish Trade-related Issues		
Program Thrust:	V	Total Duration:	2013 - 2017
Lead Department:	Secretariat	Lead Country:	Thailand
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 444,152
Project Partner:	None	Budget for 2015:	USD 68,699
Project leader:	Somboon Siriraksophon	Involved Country	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 needed 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 Resolution 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"

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 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 Technical Consultation (RTC) or even Senior Official Meeting (if required) in order to discuss and consider the international fish trade related issues in which may impacts to the development of fisheries and aquaculture in the Southeast Asian Region. The outputs from the RTC are the regional interest to be addressed 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 submitted to the SEAFDEC Council directors for endorsement and also submitted to ASEAN for Common Position.
Activity 3. Building the awareness and disseminating 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 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1	Sub-activity 1.1 Review the status of international fish trade-related issues	700	000	0	500	500
	Sub-activity 1.2 Coordinate with other regional and international organizations	15,000	19,000	4,090	18,500	10,000
Activity 2	Sub-activity 2.1: Provide platform to develop Common/ coordinated position and policy recommendation	60,000	119,000	104,113	47,669	35,000
Activity 3	Sub-activity 3.1: Publicize the results within and outside the region	1,300	1,000	780	2,000	2,000
	Sub-Total Budget	80,000	139,000	108,983	68,669	47,500

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

The key achievements of the project implementation for the year 2015 are as follows:

- The 3rd draft of the ASEAN Catch Documentation Scheme (ACDS) and the Info-graphic on Usages of ACDS in Various Scenarios of Trading of Fish and Fishery Products in ASEAN Region were developed based on Experts consultations (in cooperation with MFRDMD). These documents will be used for stakeholder consultations during September – December 2015.
- Concept note of the Regional Cooperation for promotion of the Port State Measures implementation in the ASEAN region was proposed to the 23ASWGFi. However, it was suggested to prior submit to the SEAFDEC Council for consideration and support before submission to the ASEAN forum.
- The zero draft of the Regional Plan of Action for managing fishing capacity (RPOA-Capacity) was developed by the Secretariat and through the Expert Consultation in August 2015. It is expected that the zero-draft will be finalized through the 2nd Regional Technical Consultation organized in December 2015, prior to submission for endorsement by the Council at its 48th Meeting.
- The reviewed work on the Commercially Exploited Aquatic Species listed in the CITES Appendices including the species of a) Class ACTINOPTERYGII (Fishes) and b) Class ELASMOBRANCHII (Sharks) were addressed at the 11th Meeting of the ASEAN Expert Group on CITES (11AEG-CITES). This issues on conservation and management Catadromous Eels including the resources status of the Japanese eels are also addressed for consideration and future requirement for the ASEAN Common position to avoid listing to the CITES Appendices.
- Support MFRDMD on finalizing the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain.
- Support TD on establishment of the Regional Fishing Vessels Record as a tool to eliminate and combat IUU fishing in the ASEAN 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. Monitoring & Enhancing the Capacity on International Fish Trade-related Issues					
Sub-activity 1.1 Attended the 11 th Meeting of the AEG-CITES on 7 th -8 th	I	20	1	0	0 (MRC)

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
May 2015 at Rizqun International Hotel, Banda Seri Begawan, Brunei Darussalam					
<u>Sub-activity 1.2</u> Meeting with FiA-Cambodia on the Development of NPOA-IUU and Improvement of Fishing Licensing System 15-17 July 2015	I	15	3	0	2,300
<u>Sub-activity 1.3</u> Internal Meeting of the SEAFDEC Initiatives on Combating IUU Fishing in Southeast Asian Region and Ways Forward, 13 - 14 August 2015 at Concorde Hotel (KLIA), Malaysia	I	0	12	0	1,790
Activity 2 Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations					
<u>Sub-activity 2.1</u> Conducted the 1 st RTC on Drafting the RPOA-Capacity, 24-26 Feb 2015, KL, Malaysia (cost shared with Sweden Project)	P	24	14	4	28,800
<u>Sub-activity 2.2</u> Finalized the Guideline for "Preventing The Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain" on 21-22 April 2015 at MFRDMD, Malaysia	P	0	7	0	1,700
<u>Sub-activity 2.3</u> 2 nd Regional Expert Consultation on the ASEAN Catch Documentation Scheme on 25 th -27 th May 2015, HIG Hotel Langkawi, Malaysia	P	5	11	4	16,200
<u>Sub-activity 2.4</u> Conducted the Experts Group Meeting on Development of the RPOA-Capacity, 19-21 August 2015, Songkhla, Thailand (cost shared with Sweden project)	P	20	20	0	19,413
<u>Sub-activity 2.5</u> Conducted the Stakeholder Consultation on ACDS in BN, ID, MY, MM, PH, SG, TH and VN (Sept. -Dec. 2015)	P	100	5	0	21,000
<u>Sub-activity 2.6</u> Conducted the RTC to finalize the RPOA-Capacity in December 2015, Thailand (cost shared with Sweden Project)	P	24	15	0	17,000
Activity 3 Building the awareness and disseminating Project outputs					
<u>Sub-activity 3.1</u> Manual and package of the User Account for RFVR Database System	I				780

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
<u>Sub-activity 1.1</u> Attended the 11 th Meeting of the AEG-CITES on 7 th -8 th May 2015 at Rizqun International Hotel, Banda Seri Begawan, Brunei Darussalam	Awareness building on CEAS particularly on the Japanese Eels and Indonesian Short-fin Eels	- The AEG-CITES Members understood the current situation of the CEAS that listed in the CITES Appendices including the situation of catadromous eels (Japanese eels and Indonesian short-fin eels)
<u>Sub-activity 1.2</u> Meeting with FiA-Cambodia on the Development of NPOA-IUU and Improvement of Fishing Licensing System 15-17 July 2015	Awareness building on Cambodian Flag of Convenience operated outside the EEZ and Future plan for improving fishing licensing system	- The Possible action carried out by FiA and Government of Cambodia on combating IUU fishing and elimination of the FOC using Cambodian Flags outside the EEZ - Required improvement of the fishing licensing system through the use of database system (future work plan)
<u>Sub-activity 1.3</u> Internal Meeting of the SEAFDEC Initiatives on Combating IUU Fishing in Southeast Asian Region and Ways Forward, 13 - 14 August 2015 at Concorde Hotel (KLIA), Malaysia	Finalized SEAFDEC framework to combat IUU fishing in the ASEAN Region	- All SEAFDEC Departments involved in the project-related to combating IUU fishing understood their role and frameworks for future activities to avoid duplication efforts but enhancing the cooperation in meeting at the same goal
Activity 2		
<u>Sub-activity 2.1</u> Conducted the 1 st RTC on Drafting the RPOA-Capacity, 24-26 Feb 2015, KL, Malaysia (cost shared with Sweden project)	List of priority Issues for drafting the RPOA-Capacity	- Developing a zero draft of the RPOA-Capacity based on the priority issues raised during the meeting
<u>Sub-activity 2.2</u> Finalized the Guideline for "Preventing The Entry of Fish And Fishery Products From IUU Fishing Activities Into the Supply Chain" on 21-22 April 2015 at MFRDMD, Malaysia	Finalized Draft of the ASEAN Guidelines	- The final draft of the ASEAN Guidelines was supported by the 23ASWGFi to be raised for consideration by the high-levels
<u>Sub-activity 2.3</u> 2 nd Regional Expert Consultation on the ASEAN Catch Documentation Scheme on 25 th -27 th May 2015, HIG Hotel Langkawi, Malaysia.	Finalized 3 rd Draft of the ACDS and the Info-graphic on the Usages of ACDS in various Scenarios of Trading of Fish and Fishery Products in ASEAN Region	- The 3 rd draft ACDS and the Info-graphic on Usages of ACDS in Various Scenarios of Trading of Fish and Fishery Products in ASEAN Region will be used for Stakeholder Consultation and testing of the system by 2016/2017
<u>Sub-activity 2.4</u> Conducted the Expert Meeting for zero-Drafting of the RPOA-Capacity, 19-21 August 2015, Kuala Lumpur (cost shared with Sweden project)	Finalized zero draft of the RPOA-Capacity	- The final zero draft of the RPOA-Capacity will be addressed at the next RTC in December
<u>Sub-activity 2.5</u> Conducted the Stakeholder Consultation on ACDS in BN, ID, MY, MM, PH, SG, TH and VN (Sept. -Dec. 2015)	Will be updated	Will be updated
Activity 3		
<u>Sub-activity 3.1</u> Manual and	User's manual for	- The RFVR database system is promoted to

Planned activity	Expected outcome/output	Achievements
package of the User Account for RFVR Database System	accessing the RFVR Database	fisheries authority and further extend to other agency concerns and relevant stakeholders through the media/information dissemination

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1) The 3 rd draft of the ASEAN Catch Documentation Scheme	Paper	Annex 1
2) Concept note of the Regional Cooperation for promotion of the Port State Measures implementation in the ASEAN region	Paper	Annex 2
3) The zero draft of the Regional Plan of Action for managing the fishing capacity (RPOA-Capacity)	Paper	Annex 3
4) Info-graphic on Usages of ACDS in Various Scenarios of Trading of Fish and Fishery Products in ASEAN Region	Paper	Annex 4
5) User's manual for accessing the RFVR Database	Book	Annex 5 (TD)

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

Planned activity	Evaluation/ Views from Participants
Activity 1	Not applicable
Sub-activity 1.1	
Sub-activity 1.2	
Activity 2	Not applicable
Sub-activity 2.1	
Sub-activity 2.2	
Activity 3	Not applicable
Sub-activity 3.1	
Sub-activity 3.2	

6. Major Impacts/Issues

One of the big problems is on the implementation of the ACDS with aims to increase the traceability of marine capture fisheries in which impacts to all stakeholders/traders and fisheries industry that have to cooperate in implementing. The similar problems are also related to regional cooperation in implementation of the Port State Measures Agreement and managing of fishing capacity. This project strategy is to address these issues at the high levels for their support and commitment in implementation the management tools and measures developed from the project, to ensure that the AMS cooperation and support from stakeholders are in place.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1. Monitoring & Enhancing the Capacity on International Fish Trade-related Issues		
Sub-activity 1.1	In-depth reviews the proposed listing of CEAS into the CITES Appendices to be addressed at the ASEAN-SEAFDEC Forum as a preparatory process for the inputs to the CITES-COP17 in 2016	500
Sub-activity 1.2	Coordinate and promote the ASEAN-SEAFDEC Common position at the CITES-COP17	12,500

Proposed Activity	Description of Proposed Activity	Proposed Budget
<u>Sub-activity 1.3</u>	Coordinate and promote the ASEAN-SEAFDEC Common position at the 12AEG-CITES and other ASEAN Forum	2,000
<u>Sub-activity 1.4</u>	Address the Regional Initiatives on combating IUU fishing to International Forum	4,000
Activity 2. Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations		
<u>Sub-activity 2.1</u>	Conduct the Expert Consultation for Regional Cooperation in Implementation of the Port States Measures Agreement (in cooperation with TD)	10,000
<u>Sub-activity 2.2</u>	Conduct the Regional Technical Consultation to develop the ASEAN-SEAFDEC Common Position and / or Coordinated Position on the CITES-related issues	20,669
<u>Sub-activity 2.3</u>	Conduct the RTC on Drafting the Declaration on combating IUU fishing to be addressed at the High-level meeting in August (in cooperation with SEAFDEC-Sweden project)	17,000
Activity 3. Building the awareness and disseminating from the Project outputs		
<u>Sub-activity 3.1</u>	Develop and disseminate the publications-related to Regional Initiatives on Combating IUU fishing and ASEAN-SEAFDEC Common Position	2,000
Total budget		68,669

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
<u>Sub-activity 1.1</u>	Awareness building on the proposed listing of the CEAS into the CITES Appendices, Capacity building on the status of proposed CEAS and solution to support the development of ASEAN-SEAFDEC Common position
<u>Sub-activity 1.2</u>	ASEAN Member States support the Common Position
<u>Sub-activity 1.3</u>	AEG-CITES support the ASEAN-SEAFDEC Common Position
<u>Sub-activity 1.4</u>	International forum acknowledged the ASEAN cooperation on combating IUU fishing particularly on the RFVR, ACDS and Implementation of PSMA
Activity 2	
<u>Sub-activity 2.1</u>	Concept proposal of the ASEAN Cooperation in Implementation of the Port State Measures Agreement to combat IUU fishing The harmonized Priority Issues needed for regional cooperation in implementation of the PSMA
<u>Sub-activity 2.2</u>	ASEAN-SEAFDEC Common Position and / or Coordinated Position on the CITES-related issues
<u>Sub-activity 2.3</u>	Draft ASEAN-SEAFDEC Declaration on Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish And Fisheries Products
Activity 3	
<u>Sub-activity 3.1</u>	Publications-related to Regional Initiatives on Combating IUU fishing and ASEAN-SEAFDEC Common Position

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1												
Sub-activity 1.1												
Sub-activity 1.2												
Sub-activity 1.3												
Sub-activity 1.4												
Activity 2												
Sub-activity 2.1												
Sub-activity 2.2												
Sub-activity 2.3												
Activity 3												
Sub-activity 3.1												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND PROPOSED ACTIVITY FOR YEAR 2016**

Project id: 2013060102			
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Strengthening SEAFDEC Network for Sustainable Fisheries		
Program Thrust:	V	Total Duration:	2013 - 2017
Lead Department:	Secretariat	Lead Country:	Indonesia
Donor/Sponsor:	JTF-6	Total Donor Budget:	USD 276,000
Project Partner:	None	Budget for 2016:	USD 54,000
Project leader:	PPC Office	Involved Country	All ASEAN Member Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Dealing with international and regional fisheries related issues which might affect sustainable development and management of fisheries and aquaculture, there is a need 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 aim 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 magazine and/or specific publication such as Fish for the People, and SEASOFiA.

2. Background and Justification

SEAFDEC has been working on the promotion of Sustainable Fisheries Development in the Southeast Asian Region for more than 4 decades since established. The SEAFDEC program frameworks to support member countries has been significantly changed in 1998 when SEAFDEC adopted the Resolution on SEAFDEC Strategic plans at the 30th Meeting of the SEAFDEC Council and more clear after the new millennium in 2001 when ASEAN-SEAFDEC adopted the Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region” as well as the new decade Resolution and Plan of Action on Sustainable Fisheries for Food Security toward 2020 in 2011 as a policy guidelines for SEAFDEC and member countries. To support the implementation of the Resolution and Plan of Action, taking into account environmental changes and many policy emerging issues pressing at global and regional levels including the problems of IUU fishing, SEAFDEC therefore proposes a continuing project to strengthen 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 needed 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 level through the quarterly magazine or specific publication including SEASOFiA.

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) 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

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 officers from ASEAN Member States who are invited and stationed at SEAFDEC/Secretariat to be involved in activities of SEAFDEC especially in terms of coordination with their own countries. In this activity, SEAFDEC supports cost 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 implementing 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 program/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

Activity	Description
	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, SEAFDEC Newsletters, and SEASOFiA in order to enhance its visibility to the Member Countries, regional and international arenas.

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
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
	1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	0	1,000	8,500	10,500	10,500
Activity 2:	2.1 Monitor and evaluation of SEAFDEC programs/project activities	16,000	16,000	6,500	2,500	2,500
Activity 3	3.1 Produce and disseminate of SEAFDEC special publications	7,500	7,500	9,000	9,000	9,000
	Sub-Total Budget	55,500	56,500	56,000	54,000	54,000

PART II: ACHIEVEMENTS OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the project Implementation for the Present Year

The key achievements of the project implementation for the year 2015 are the continued support and build the capacity of the RFPNs from 8 ASEAN Member States namely Cambodia, Indonesia, Lao PDR, Myanmar, Malaysia, the Philippines, Thailand and Viet Nam supported by this project (3 countries) and SEAFDEC-Sweden project (5 countries), enhancing the effective management of the SEAFDEC programs through the development of the database system in collaboration with CFTD/TD. The other achievement is strengthening cooperation with SEAFDEC partnership on the use of the Training Ship-KOYO Maru of the NFU for fisheries resources surveys in the Cambodian waters with the support from FiA and Government of Cambodia. In addition, the results of project implementations were published and disseminated through the SEAFDEC publications such as Fish For the People.

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) 3 Regional Fisheries Policy Network (RFPNs) for Cambodia, Lao PDR and Viet Nam are supported	T	8	-	-	32,000
2) Enhanced 3 RFPNs capacity through participations of ASEAN-SEAFDEC Meetings as follows:	T	8 RFPNs	-	-	-
- Working Groups Meeting and Technical Meeting on Joint Program on Tuna Research in Sulu and Sulawesi Seas, 10-11Feb 2015, Bangkok, Thailand					

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
- Forty-seventh Meeting of the Council Southeast Asian Fisheries Development Center, 31 March -3 April 2015, Le Meridien Chiang Rai Resort, Chiang Rai, Thailand					
- RTC on The Regional Fishing Vessels Record: Use and Way Forward of RFVR Database as a Management Tool to Reduce IUU Fishing in Southeast Asian Region, 2-4 June 2015, Pattaya, Chonburi, Thailand					
- 2 nd Meeting of the Scientific Working Group on Neritic Tunas Stock Assessment in the Southeast Asian Waters, 15-17 June 2015, RIMF, Hai Phong, Viet Nam					
- Symposium on Strategy for Fisheries Resources Enhancement in the Southeast Asian Region, 27-30 July 2015, A-One Hotel, Pattaya, Thailand					
- <more activities will be updated for the 2 nd half of the year>					
- Provided new computers for 3 RFPNs for increasing working efficiency	C	3	-	-	2,000
Activity 1.2					
1) 11 th Meeting of the AEG-CITES on 7th-8th May 2015 at Rizqun International Hotel, Banda Seri Begawan, Brunei Darussalam	T	-	1		MRC
2) Consultation Visit to FiA, Cambodia under the collaborative arrangements between NFU/Japan and FiA on the arrangements for T/S KOYO Maru Cruise in Cambodia Water for 2015 survey, 17-Sept 2015	R	7	2	3 (Japan)	On-going (2,500)
3) <will be updated for the 2 nd half of the year>	-	-	-	-	On-going (6,500)
Activity 2.1					
1) Developing the SEAFDEC program Database for effective management (improved system cost)	T	-	3	-	On-going (3,000)
2) Monitoring and review implementation of the ASEAN-SEAFDEC Resolution and Plan of Action (in relation to CCRF)	R	-	3	-	On-going (1,000)
3) SEAFDEC Questionnaires on Human Resources in ASEAN Countries (lead by RFPNs)	T	-	10	-	On-going
Activity 3.1					
1) Publication and Dissemination of the Fish for the people	T	-	-	-	7,500
2) Publication on Combating IUU	T	-	-	-	On-going

List of Actual Sub-activity	Type of activity	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Fishing (On-going)					(1,500)
Total Budget Spent till Aug. 15					41,500
Remaining Budget till end Dec. 15					14,500

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1.1		
1) Regional Fisheries Policy Network (RFPNs) for Cambodia, Lao PDR and Viet Nam are 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	Officials from Cambodia, Lao PDR and Viet Nam stationed at SEAFDEC Secretariat and involved in several SEAFDEC activities and coordinated with their own countries for technical matters and arrangements.
2) Enhanced 3 RFPNs capacity through participations of ASEAN-SEAFDEC Meetings 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. In addition, RFPNs were trained on the recording of the meeting in order to enhance their English ability in specific fisheries issues.
Activity 1.2		
3) 11 th Meeting of the AEG-CITES on 7th-8th May 2015 at Rizqun International Hotel, Banda Seri Begawan, Brunei Darussalam		Awareness building to the ASEAN Expert Group on CITES (AEG-CITES) on the current listing of the Commercial Exploited Aquatic Species (CEAS) to the CITES Appendices, and the possible proposed listing of CEAS such as Bluefin tuna, Japanese eels, and impact on Indonesian short-fin eels.
4) Consultation Visit to FiA, Cambodia under the collaborative arrangements between NFU/Japan and FiA on the arrangements for T/S KOYO Maru Cruise in Cambodian Waters for 2015 survey, 17-Sept 2015		Supported joined discussion between FiA, NFU and SEAFDEC staffs for the Collaborative Research Program on the preparation for the Fisheries Resources Survey in the Cambodian waters by T/S KOYO Maru of the National Fisheries University (NFU). The program is planned for 3 years from 2014-2016.
5) Will be updated		(will be updated in the 2 nd half of 2015)
Activity 2.1		
1) Develop the SEAFDEC program Database for effective management (improved system cost)	Strengthened monitoring and evaluation of the SEAFDEC programs and projects	The 1 st 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 were compiled for further reviews and report to the 38PCM.
3) Develop the SEAFDEC Questionnaires on Human		The 1 st draft of SEAFDEC Questionnaires on Human Resources in ASEAN Countries was prepared for

Planned activity	Expected outcome/output	Achievements
Resources in ASEAN Countries (lead by RFPNs)		further development of the Online system Questionnaires.
Activity 3.1		
1) Publication and Dissemination of the Fish for the people	Strengthened the information dissemination of SEAFDEC projects results	3 volumes of Fish for the People were disseminated to worldwide institutions related to fisheries
2) Publication on Combating IUU Fishing (Ongoing)		<On-going>

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
1. 3 volumes of Fish for the People	Magazine	PDF
2. Template for SEAFDEC Program	Document	PDF
3. Draft SEAFDEC Program Database System	Website	URL
4. Results of the Country Implementation on 2011RES and POA	Document	<On going>
5. Will be updated		

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	None
Activity 1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	None
Activity 2.1: Monitor and evaluation of SEAFDEC programs/project activities	None
Activity 3.1: Produce and disseminate SEAFDEC special publications	None

6. Major Impacts/Issues

The key problems for collaborative arrangements with NFU for FiA on Fisheries Resources Survey is the human resources and financial support for data analysis after the survey for TD as a Technical Department which is responsible for data analysis. Another problems is knowledge transfer to FiA researchers.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(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

Proposed Activity	Description of Proposed Activity	Proposed Budget
1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	<ul style="list-style-type: none"> - Continued enhance the cooperation with AMSs and other SEAFDEC partnership to address the awareness on Fisheries Related Issues and other important issues that might impact to the Region. - Continued cooperation with NFU through the use of KOYO Maru to support AMS in conducting the fisheries resources survey. - Other urgent matter 	10,500
2.1 Monitor and evaluation of SEAFDEC programs/project activities	<ul style="list-style-type: none"> - Conduct full operation of the SEAFDEC program Database to increase the effectiveness of program management - Reviews on the Implementation of the 2011 RES & PoA and reporting to the 48CM 	2,500
3.1 Produce and disseminate SEAFDEC special publications	<ul style="list-style-type: none"> - Continued publish and dissemination of the Fish For the People, to enhance its visibility to the Member Countries, regional and international arenas. 	9,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	<ul style="list-style-type: none"> - Increased knowledge of the 3-RFPNs on developing the policy recommendation and common positions related to CITES- Issues - Gained experiences in writing the reporting of the meeting - 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	<ul style="list-style-type: none"> - Attended the AEG-CITES to build the awareness on proposed listing of the CEAS to the CITES Appendices while introduce the agreed common position for addressing at the next CITES-COP 17. - The results of 2014 and 2015 Collaborative Research Program in Cambodia waters - Strengthened other cooperation with SEAFDEC Partnership
2.1 Monitor and evaluation of SEAFDEC programs/project activities	<ul style="list-style-type: none"> - Improved Database system for SEAFDEC Program - Improved monitoring and evaluation system
3.1 Produce and disseminate of SEAFDEC special publications	<ul style="list-style-type: none"> - Published and disseminated of SEAFDEC Publication such as the Fish For the People,

3. Schedule of Activity for the Year 2016

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	X	X	X	X	X	X	X	X	X	X	X	X
1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs			X	X	X	X	X	X	X	X	X	
2.1 Monitor and evaluation of SEAFDEC programs/project activities		X	X	X	X	X	X	X	X			
3.1 Produce and disseminate SEAFDEC special publications								X	X	X	X	X

PROJECT DOCUMENT
PROPOSED ACTIVITY FOR YEAR 2016
AND
ACHIEVEMENTS FOR YEAR 2015

			Project id: 2013060103
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia		
Program Thrust:	Special Project	Total Duration:	5 yrs (2013-2017)
Lead Department:	SEAFDEC/Secretariat	Lead Country:	Indonesia
Donor/Sponsor:	Sida (through the Embassy of Sweden, Bangkok)	Total Donor Budget:	Total budget of 5 years, 48 Millions SEK
Project Partner:	BOBLME, CTI-CFF FAO/APFIC, MRC UNEP, IUCN/MFF, ILO, USAID	Budget for 2016:	10,000,000 SEK (Approx 1,323,754 USD)
Project leader:	Ms. Pattaratjit Kaewnuratchadasorn SEAFDEC-Sweden Project Manager	Involved Country	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 these resources. Through earlier Sida (current name is Sweden) support, 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.

The SEAFDEC-Sweden project (2013-2017) is building upon on the earlier work done under the SEAFDEC-Sweden cooperation. The ultimate targets of the Project are the poor coastal and inland communities who continue to experience declining catch as well as increased competition and conflict over natural resource use and space in coastal and inland waters of Southeast Asia. In a broader context, beneficiaries will also include staff of governments (local and central), NGOs, and international and regional organizations. The beneficiaries will be provided with support and guidance through collaborative arrangements supported by SEAFDEC-Sweden, in the process of developing better management of fisheries and important habitats in national and sub-regional contexts.

The basic strategy of the SEAFDEC-Sweden project is to build upon the expressed needs to improve social well-being and environmental health, by promoting processes to improve the management of fisheries, fishing capacity and better management of aquatic environments and habitats of importance for key species. To incorporate all relevant aspects (social, governance and aquatic resources/ environment) an ecosystems approach will be applied. This includes management matters, such as (larger) fish resources conservation areas (*e.g.* building upon MPAs, *refugia*, etc), management of fishing capacity (combating IUU Fishing), social mobility and conflicts, etc. The perspective include the establishment of sub-regional agreements or other arrangements of relevance to fisheries and habitat management in the Gulf of Thailand; Andaman Sea and to support processes for the cooperation among countries in the Sulu-Sulawesi Seas and the Mekong River Region.

As part of the SEAFDEC-Sweden Project Strategy, the project will not be implemented by SEAFDEC in isolation but will rely on cooperation with other regional/international and national bodies. In order to address issues related to the management of important habitats for fisheries, fishing capacity and socio-cultural aspects, SEAFDEC 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 (plus Timor-Leste), which implies the involvement of broad stakeholder participation.

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

- Bridging objective 1: Implementation of regional and sub-regional aquatic resources management actions by national institutions and organizations
- Bridging objective 2: Establishment and implementation of regional and sub-regional fisheries and habitat management agreements and action plans.

Outputs, Indicators and Activities

Table 1: Log Frame on Project Follow-up, Monitoring and Evaluation

Outcomes objectives	Bridging objectives	Outputs objectives	Activity	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. Sub-regional and regional agreements promoted and reported to ASWGF _i on fisheries and habitats. 2. Sub-regional and regional agreements promoted and reported to ASWGF _i on fishing capacity	1. Capacity built for integration of habitat & fisheries management and adaptation to climate change	1.1 Improved awareness and enhanced capacity/knowledge of habitat and fisheries management and ecosystem approaches to fisheries. 1.2 Collaboration with and between local organizations and stakeholders 1.3 The drafting of sub-regional frameworks and implementation plans 1.4 Dialogues to promote the understanding of trans-boundary resource and habitat management and conservation including the need for joint approaches at the sub-regional level 1.5 Establishment of trans-boundary and regional agreements on habitat and fisheries 1.6 Sub regional capacity-	At least one sub-regional and sub-sub-regional events with focus on habitat/fisheries management (reaching 250 with partners involved (2017 - 1,250/awareness)

Outcomes objectives	Bridging objectives	Outputs objectives	Activity	Key Performance Indicators (Results Assessment Framework (RAF) targets)
			building through sub regional and on-site events 1.7 Social well-being network (See also 2.6) 1.8 Diversified livelihoods (See also 2.7) 1.9 The role of women and youth (young people of 15 years and older) in fisheries (See also 2.8)	
		2. Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)	2.1 Raised awareness of the need for fishing vessel registration and licenses to fish 2.2 Strengthening of links and cooperation between SEAFDEC and international and regional organizations on the management of fishing capacity and to issue licenses to fish 2.3 The sharing of information with key stakeholders 2.4 The drafting of plans to monitor, record and control active fishing capacity 2.5 MCS network establishment. 2.6 Social well-being network (See also 1.7) 2.7 Diversified livelihoods (See also 1.8) 2.8 The role of women and youth (young people of 15 years and older) in fisheries (See also 1.9)	One regional or sub-regional event organized (with partners) where fishing vessel registration, licensing, IUU fishing and labour issues will be discussed involving relevant (two or more) departments with around 60 participants
		3. Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements	3.1 Collaboration between ASEAN countries and regional, national and local organizations 3.2 Collaboration between SEAFDEC and other regional and international organizations strengthened. 3.3 Regional and sub-regional consultations 3.4 Reviews and interpretations of	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 events organized with partners (average 50

Outcomes objectives	Bridging objectives	Outputs objectives	Activity	Key Performance Indicators (Results Assessment Framework (RAF) targets)
			important international conventions 3.5 Sharing of information on legislation and institutional arrangements for fisheries and habitat management by ASEAN countries 3.6 Information from project events made available to ASEAN bodies, SEAFDEC and ASEAN Member Countries 3.7 Triggering of policy changes/adjustments resulting from the work of the project 3.8 The profile and status of fisheries within the ASEAN structure and policy development 3.9 Strengthening the role of SEAFDEC in ASEAN	partners) Note: focus on national and local organizations while 3.2 focus on regional and international organizations
		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 (herein after refer to as the project) is presented in a so-called Results Assessment Framework (RAF).

3. Overall Scope/Description of Project

For the purpose of implementation and follow up, activities are planned under three output groups and Project management and coordination. This would also allow for the cross-referencing (*e.g.* gender, health, environment, climate change and capacity building) between outputs group, when assessing the results and related outcomes.

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
4. Project Management and Coordination

The geographical coverage includes four sub-regions (Andaman Sea, Gulf of Thailand, Sulu-Sulawesi Seas and the Mekong River Region), the SEAFDEC-Sweden project has been successful in follow up with each of the sub-regions to further develop cooperative dialogue and action. 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 the process for regional cooperation on neritic tuna, fishing capacity, combating IUU fishing and EAFM and capacity program 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, etc in recognition of steps being taken and impacts achieved.

In addition, SEAFDEC-Sweden project supports the capabilities of young blood for fisheries development and management through a long-term human resource development program for its Member Countries. Appointed fishery officer are seconded at the SEAFDEC Secretariat under the program the SEAFDEC Regional Fisheries Policy Network (RFPN) with expanded role of assisting SEAFDEC in the development of regional priority and policy issues through their participation in the implementation of regional programs. After completing their assignment in SEAFDEC, the RFPN members are expected to keep running their networking group and to continue playing the important role of promoting responsible and sustainable fisheries development in their respective countries.

3.1 Activity, Sub-activity and Proposed Budget for 2013-2017

Budgets in the Table 2 show the relative balance between Output Objectives, cross-cutting elements has been divided between the groups. Actual need and use of funds will depend on successful link with partner organizations, such as BOBLME, MRC and CTI-CFF.

Table 2 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: Baht)

(Activity Group) Output Objective	Sub-Activity	2013	2014	2015	2016	2017
Output objective1: Capacity built for integration of habitat & fisheries management and adaptation to climate change	Output objective 1 has 9 activity “indicators” (see above) together with annual targets	7,684,197.47	11,369,406.55	0	11,369,406.55	11,369,406.55
Output Objective2: Capacity built and systems improved	Output objective 2 has 8 activity “indicators” (see above) together	6,244,861.38	9,071,494.78	0	9,071,494.78	9,071,494.78

(Activity Group) Output Objective	Sub-Activity	2013	2014	2015	2016	2017
for the management of fishing capacity (monitoring; record and control)	with annual targets					
Output Objective3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements	Output objective 3 has 9 activity “indicators” (see above) together with annual targets	3,412,594.53	6,097,726.64	0	6,097,726.64	6,097,726.64
4. Administration, personnel and coordination	1. Expenses of RFPN Staff, and administration 2. Planning meetings, regular coordination meetings (FAO/RAP/APF IC, 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 2015 review (year 3) and project evaluation (year 5)	12,907,594.53	14,422,775.56	0	14,422,775.56	14,422,775.56
	Sub-Total (THB)	37,144,156.93	40,961,403.53		40,961,403.53	40,961,403.53
	Equivalent to (SEK)	8,000,000	10,000,000	-	10,000,000	10,000,000

Remark: This year, 2015, Zero (0) disbursement from Sida based on the balance from 2014 and the use of fund was low.

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Year 2015

In 2015, the SEAFDEC-Sweden project has been continued supporting and facilitating bi-lateral dialogues and sub-regional dialogues, in particular the Gulf of Thailand sub-region, the Andaman Sea (in cooperation with the BOBLME), the Mekong River Region (in cooperation with the Mekong River Commission) and the Sulu-Sulawesi Seas (in cooperation with the Coral Triangle Initiative). The project highlighted the focus to develop agreements between countries on matters of importance on the concept of ecosystems based approach to fisheries management, such as (larger) fish resources conservation areas (e.g. building upon MPAs, *refugia*, etc), fishing capacity (IUU Fishing) management, social mobility, local capacity. The SEAFDEC-Sweden project emphasized on the implementation of the activities to accommodate to the defined the 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) and 3) Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements. A summary of the activities implemented is described as follows:

A series of meetings and workshops for strengthening the cooperation between neighboring countries were conducted for each sub-region with aim to improve the management of fisheries to sustain the fisheries resources and fisheries and habitat management in the sub-regions.

The Gulf of Thailand sub-region: Bilateral dialogue was arranged between Cambodia and Thailand (January 2015), Based on the joint actions identified during the bilateral workshops, several activities were implemented during the year 2015 that includes:

- a series of workshops for development of SOPs for data collection for transboundary species and training for enumerators for Cambodia, Thailand and Viet Nam;
- Training for the Trainers on Hatchery of Blue Swimming Crab;
- Reviews laws and regulations (Cambodia, Lao PDR, Viet Nam);
- Training on Essential Ecosystem based Approach to Fisheries Management (EEAFM) in Myanmar and Lao PDR; and
- Study on Strengthening Malaysia and Thai Partnership in support of Joint Fisheries Planning and Management in the Western Gulf of Thailand

In addition, the 5th Meeting of the Gulf of Thailand sub-region was convened in September 2015 to update the progress of the activities implemented at the bilateral dialogue and draft work plans for 2016. During the discussion, countries provided information and shared the update on the current status of fisheries resources and priorities trans-boundary species (anchovy, Indo-Pacific mackerel and Blue Swimming crab) for fisheries resources management in the Gulf of Thailand sub-region.

SEAFDEC as an intergovernmental body is not well suited to work at field level but to facilitate local capacity building, to strengthen local organizations, improved livelihood opportunities, poverty alleviation and to restore important habitats. The project also provided local capacity building facilitated by local organizations with the aims of improving livelihood opportunities, undertaking poverty alleviation, and restoring important fishery resources and habitats. In 2015, SEAFDEC continued support sub-contract agreements with the Learning Institute, Cambodia entitled “Strengthening Community Fisheries Management and Livelihoods Diversification in Cambodia”, CORIN-Asia Cambodia, carried out the activities aiming to i) strengthen relevant local institutions’ capacity to enable them to address natural resource degradation and climate change vulnerability of target coastal communities; ii) improve local people’s capacity to effectively cope with the challenges of climate change and other changes brought about by development through enhanced family livelihoods, sustainable use of natural resources and understanding of risks and iii) strengthen the existing approaches at the local level developed through WAP for sustainable resource management of target coastal communities.

While CORIN-Asia Myanmar implemented the activities with the overall objective of building capacity of local level government agencies and local authorities towards sustainable management of fisheries resources and important coastal habitat to protect coastal resources. It is anticipated that establishment of

such linkages with local organizations and on-going projects would be an important factor to ensure adequate support and sustainability of the project outcomes.

With a region-wide perspective, the SEAFDEC-Sweden project has been successful in advancing the regional dialogue (including government agencies, NGOs and private sector) to develop a regional plan of action for neritic tuna (RPOA-Neritic Tuna) and establishment of the Scientific Working Group for neritic tuna.

The project has successfully supported the Member Countries for the regional cooperation on the development of the Regional Plan of Action on Sustainable Utilization of Neritic Tunas in the ASEAN Region (RPOA-Neritic Tuna) which was endorsed at the 47th Meeting of SEAFDEC Council in April 2015 and at the ASWGFi, respectively. The project also continued to provide the platform for the “2nd Meeting of the Scientific Working Group (SWG) on Neritic Tuna Stock Assessment in Southeast Asian Waters” from 15 to 17 June 2015 at the Research Institute for Marine Fisheries (RIMF) in Hai Phong, Viet Nam. The Meeting agreed to carry out two main activities, namely: Genetic Study for Neritic Tunas to be conducted in 24 sampling sites covering the South China Sea, Gulf of Thailand and Andaman Sea; and Stock Assessment for Long Tail Tuna and Eastern Little Tuna/Kawakawa using a production model. Furthermore, the meeting also agreed on the finalizations of Standard Operating Procedures (SOPs) for Genetic Study and Data Collection of Neritic Tunas.

In addition, the project also supported the series of consultation to the draft of the Regional Plan of Action for Management of Fishing Capacity (RPOA-Capacity), which could serve as basis for the AMSs in formulating relevant policies and provide an enabling environment for clear direction and understanding of the need to effectively manage the fishing capacity at national level. In addition, the need for AMSs to strengthening sub-regional and regional cooperation in managing fishing capacity in the trans-boundary areas such as in the Gulf of Thailand (GOT), Andaman Sea, Sulu-Sulawesi Seas, and other sub-regional areas where the fisheries are needed to manage together. On 19-21 August 2015, the project co-hosted the Experts Group Meeting on the Regional Plan of Action for Managing Fishing Capacity (RPOA-Capacity) was organized by SEAFDEC in Songkhla Province, Thailand on 19-21 August 2015. The Experts Group Meeting was convened in response to the suggestion made during First Regional Technical Consultation (RTC) on Development of Regional Plan of Action for Management of Fishing Capacity in Southeast Asia which was organized in Kuala Lumpur, Malaysia in February 2015. Organized by SEAFDEC in collaboration with the Department of Fisheries Malaysia (DOF) and co-financially supported by the Japanese Trust Fund and the SEAFDEC-Sweden Project, the First RTC identified the key issues on management of fishing capacity to be considered in developing the RPOA-Capacity. During the Experts Meeting, experiences were shared as well as the lessons learnt on the fishing capacity adopted by the respective countries, and used to discuss the pre-zero draft Regional Plan of Action for Managing Fishing Capacity (RPOA-Capacity) and produce the zero draft of the RPOA-Capacity for Southeast Asia. During the three-day intensive discussion, the zero-draft RPOA-Capacity came into final form, which would be revisited by the countries in order to finalize the RPOA-Capacity. Then, the 2nd RTC on the Development of Regional Plan of Action for Management of Fishing Capacity in Southeast Asia would be convened in December 2015 to finalize the zero draft RPOA-Capacity which to be tabled for endorsement at the 48th Meeting of SEAFDEC Council in 2016.

On 15-16 September 2015, the United States Agency for International Development (USAID) and SEAFDEC jointly convened the “Oceans and Fisheries Partnership Inception Workshop” in Bangkok, Thailand with co-financed with USAID, Japanese Trust Fund and SEAFDEC-Sweden project. At the outset, the strong desire of the U.S. Government to undertake measures against IUU fishing and seafood fraud was expressed. Such strong will has led to the establishment of a cooperation between USAID and SEAFDEC towards the development of the “Oceans and Fisheries Partnership” which has the overall goal of “*increasing the ability of regional fishery organizations to conserve marine biodiversity and combat IUU fishing in the Asia Pacific region*”, to ensure sustainable fisheries and sustainability of the oceans for food security.

The cooperation has been maintained with important regional and international partners, organizations and relevant institutions to, as suitable, avoid duplication, to provide a basis for continued sharing of information and to secure other inputs as needed. Organizations and initiatives include; ASEAN and ASEAN Secretariat; FAO Regional Office in Bangkok/APFIC; The Bay of Bengal Large Marine Ecosystems Project (BOBLME); Mangroves for the Future/IUCN; Regional Plan of Action (RPOA-IUU)

to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region; Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security (CTI-CFF); USAID, Mekong River Commission (MRC); UNEP; and the International Labour Organization (ILO).

2. Activities Conducted in the Current Project

Table 5: 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	Others organizations	
Output objective 1: Capacity built for integration of habitat & fisheries management and adaptation to climate change					
1. The Sub-regional Technical Meeting on Effective Fisheries Management between Cambodia and Thailand, 20-22 January 2015, Trat, Thailand	P	17 (RFPN=5)	7	5	
2. The 1 st bilateral Working Group Meeting between Cambodia and Viet Nam on Transboundary Species in the Gulf of Thailand, 3-5 February 2015, Ho Chi Minh, Viet Nam	I	24	1		
3. The National Workshop and Training of Enumerators for Data Collection for Transboundary Fisheries and Habitat Management in the Gulf of Thailand, 17-19 March 2015, Kampot, Cambodia	I	31	1		
4. The National Workshop and Training of Enumerators for Data Collection for Transboundary Fisheries and Habitat Management in the Gulf of Thailand, 26-27 March 2015, Rayong, Thailand	I	13	1		
5. The National Workshop and Training of Enumerators for Data Collection for Transboundary Fisheries and Habitat Management in the Gulf of Thailand, 22-24 April 2015, Phu Quoc, Viet Nam	I	26	1		
6. Site visit to Marine Aquaculture Research and Development Center (MARDeC), 28-30 April 2015, Preah Sihanouk	T	5	1		
7. The Training of the Trainers on Hatchery of Blue Swimming Crab, 9-29 August 2015, Suratthani, Thailand	T	6			
8. Conduct the Study on "Preliminary Study on Promoting Change-Resilient Communities through Comprehensive and Sustainable Management of Wetlands Resources in Coastal Cambodia" (sub-contract)	R				

List of Actual Sub-activity (1)	Type of activity	Number of Participants			Total Budget Spent (Baht)
		MCs	SEAFDEC	Others organizations	
9. Conduct the Sustainable Use of National Resources and Livelihoods Development for Climate Change Resilient Coastal Communities (sub-contract)	R				
10. Conduct the “Strengthening of Communities Fisheries Management and Livelihoods Diversification” in Cambodia (sub-contract)	R				
11. The Essential EAFM Training for Lao PDR , 2-7 November 2015, Champasak, Lao PDR	T	30			
12. The Essential EAFM Training for Myanmar, 14-19 December 2015, Yangon, Myanmar	T	12			
Output objective 2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)					
13. Training Workshop on Vessel Inspections and Enforcement Measures against IUU Fishing Activities, 5-9 January 2015, Singapore	T		2		
14. Study on “Strengthening Malaysian and Thai Partnership in support of Joint Fisheries Planning and Management in the Western Gulf of Thailand” (conducted by TD)	R				
15. The Regional Technical Consultation on Development of Regional of Action-Management of Fishing Capacity, 24-26 February 2015, Kuala Lumpur, Malaysia	P	10	7		
16. The 2 nd Meeting of the Scientific Working Group on Neritic Tuna Stock Assessment in the Southeast Asian Waters, 15-17 June 2015, Hai Phong, Viet Nam	R	30	7		
17. To conduct “Compilation and Comparative Study on Laws and Regulations between Cambodia and Lao PDR (sub-contract)	R				
18. To conduct “Compilation and Comparative Study on Laws and Regulations between Cambodia and Viet Nam (sub-contract)	R				
19. To conduct “Compilation and Comparative Study on Laws and Regulations between Cambodia and Lao PDR and Cambodia and Viet Nam (sub-contract)	R				
20. To review Thailand’s existing policies and plans relating to Marine Fisheries Management (sub-contract)	R				

List of Actual Sub-activity (1)	Type of activity	Number of Participants			Total Budget Spent (Baht)
		MCs	SEAFDEC	Others organizations	
21. The Experts Group Meeting on Development of Regional Plan of Action for Managing Fishing Capacity (RPOA-Capacity), 19-21 August 2015, Songkhla, Thailand	P	9	8		
22. The 17 th National Tuna Congress and Exhibition, 3-5 September 2015, General Santos, Philippines	I		2		
23. The 2 nd RTC on the Development of Regional Plan of Action for Managing Fishing Capacity (RPOA-Capacity), 15-17 December 2015, Phuket, Thailand	P	10	8		
Output objective 3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements					
24. The 2 nd Regional Meeting on the Protection of Migrant Fishers: ASEAN Review of Guidelines on Flag State Inspection of Working and Living Conditions onboard fishing vessels, 28-29 April 2015, Jakarta, Indonesia	P	7	3		
25. 2 nd Meeting of the Southern Andaman Sea sub-region, 1-2 December 2015 in Langkawi, Malaysia	P	15	13		
26. Review available mechanisms for cooperation between Koh Kong, Cambodia and Trat province, Thailand (Sub-contracted with Dr. Sirisuda) including field survey	R				
Activity to promotion bi, tri cooperation and arrangement (also link to Outputs objective 1)					
Activity: Participation in the non-SEAFDEC-Sweden events and policy forum					
27. The 6 th Meeting of the BOBLME Project Steering Committee, 24-25 March 2015, Jakarta, Indonesia	P		1		
28. The 47 th Meeting of the SEAFDEC Council, 31 March-3 April 2015	P		7		
29. The 7 th Meeting of the ASEAN Fisheries Consultative Forum (AFCF), 8-9 June 2015, Nay Pyi Taw, Myanmar	P		1		
30. Discussion with CTI-CFF and visited to SEAFDEC/IFRDMD, 3-4 August 2015, Jakarta, Indonesia	P		1		
31. The 145 th Annual Meeting of the American Fisheries Society, 16-20 August 2015, Portland, USA	P	2			
32. The visit program of Fish Paste (Prahoc) and Dried fermented catfish of Thailand, 23 August 2015, Bangkok	P	1	1		

List of Actual Sub-activity (1)	Type of activity	Number of Participants			Total Budget Spent (Baht)
		MCs	SEAFDEC	Others organizations	
33. The Southeast Asian Regional Consultation Workshop on the Implementation of the Voluntary Guideline for Securing Sustainable Small-Scale Fisheries in the context of Food Security and Poverty Eradication, 24-27 August 2015, Bali, Indonesia	P		1		
34. The Oceans and Fisheries Partnership Inception Workshop, 15-16 September 2015, Thailand	P	5	4		
35. The 8 th RPOA-IUU Coordination Committee, 17-18 November 2015, Brunei Darussalam	P		1		
36. The 38 th SEAFDEC Program Committee Meeting and 18 th ASEAN-SEAFDEC Fisheries Consultative Group, 23-27 November, Philippines	P		3		
Cat4: Project management and coordination					
1. Expenses of Staff, RFPN and administration, 37. 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) 38. Reporting costs, editing and printing 39. Project monitoring and coordination, project mid-term review (year 3) and project evaluation (year 5) 40. Operating, equipments and maintenance expenses					

*There are 5 types of activity (R, T, I, P, and O) as follows;

- I. **Research and Development activities:** Conduct of technical/scientific research, fact-finding activities, Generation/verification of technologies that could be used by target users (*e.g.* fishers, farmers, processors).
- II. **Training activities:**
- III. **Information activities:** activities that aim to enhance collection of fisheries data and information, and improve visibility of SEAFDEC (*e.g.* production of publications, tool kits, SOP, information materials, conduct of exhibitions, etc.)
- IV. **Policy development activities:** Activities that aim to develop fisheries policies, *e.g.* expert consultation, regional consultations, development of regional guidelines, policy frameworks, etc., including desk studies on policy issues
- V. **Collaborative Program for SEAFDEC Research Vessels**
- VI. **Others:** Activities related to project administration; communication; project planning, monitoring and evaluation (including project review meeting); staff capacity building, including participation of project staff to non-SEAFDEC events, etc.

(some activities may fall into more than one category, but Departments should specify which category the activity would fit best).

3. Output(s)

Table 6: Frame of the Output-Monitoring (for SEAFDEC Sweden refer to the Results report for 2015)

Output	Key Performance Indicator	Achievement based on indicator in Year 2015	Remarks
The Results Assessment Framework (RAF) specifies three Output Objectives	To each of the Output objectives in the RAF 8 or 9 “indicators” are specified together with annual targets	The list of achievements below is examples of how these indicators are met. The results assessment report for 2015 will be available in March 2016.	
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		<ul style="list-style-type: none"> - Action plans developed to support the development of bi-lateral agreements. - Establishment of working groups of persons from concerned departments. - Identification of the type of information that the Gulf of Thailand countries see as a priority for information sharing as a basis for sub-regional dialogue. - Integration of fisheries and habitat management and the importance of trans-boundary stocks and habitats. - Agreement on the growing need to provide awareness and understanding on the important roles and functions of ports and landing places while recognizing the large amount of institutions involved in management and activities related to ports and landing sites. 	

4. Project Outcomes and Lesson Learned

1. Capacity being built to draft and implement regional and sub-regional **agreements**, including bi and tri-lateral agreements– this is inter-linked to the two preceding output objectives to build capacity to **integrate habitat and fisheries management** and adaptation to climate change; and to build capacity to develop coordinated plans to **manage fishing capacity**. The process at this stage includes awareness-raising, networking (MCS networks, social well-being, etc.) as well the importance to address livelihoods and the role of women (and youth).
2. The process of building capacity is connected to the bridging objectives in that they are aiming towards the **establishment and implementation** (by national institutions and organizations) of regional and sub-regional aquatic resources, fisheries and habitat management actions, agreements and action plans. With other words, when the dialogue, exchange of information and improved capacity (common understanding) has successfully provided the basis for agreements (MoUs, MoAs or other arrangements) and an agreement/arrangement is “signed” the process of implementation starts including continued delivery of stated output objectives – and the subsequent implementation by cooperating countries and partner organizations will be monitored.
3. Finally, the ability of the project to promote and show that implementation have contributed to the “sustainable use of aquatic resources and reduced vulnerability to climate change by coastal/rural (fishing) communities in the ASEAN region” should/will be monitored with reference to the target set for 2017 (in the RAF) that “more environmental sustainable fisheries practices and diversified livelihoods will be adopted and reported in at least 10 on-site locations in regions and sub-regions where at least five trans-boundary agreements are implemented”. Monitoring of implementation, outcomes and impacts need to done at different levels, including community level, sub-regional level and the region as a whole.

5. Major Impacts/Issues

There has been a successful facilitation of bi-lateral agreements, focusing on fisheries sector between neighboring countries, the Member Countries also requested the project to support for other bilateral dialogues in 2016. Note should be taken that some countries are a bit more reluctant to sign MOAs/formal agreement while they are still willing to agree on common work plans/action plans.

6. Project Monitoring and Evaluation

The SEAFDEC-Sweden Project conducts the Annual Review Meeting (ARM) in every March or April according to Agreement to review the progress of the implementation and discuss on the annual financial report on the utilization of the fund. The representative of Sweden and officer of the Swedish Agency for Marine and Water Management (SwAM) provide the comments and feedback for further improvement the performance of the project. During the year, the representatives of Sweden will also follow-up with the project on the progress and change based on the agreed minutes of the Meeting.

The year of 2015 is the Mid-term of the Project, the external in-depth review is a requirement under the agreement with Sweden to thoroughly review of project implementation, management and results. In this regard, the Mid-Term Review (MTR) was carried out by two external consultants namely: Mr. Voravate Cholasin and Mr. Arne C.I. Andreasson during March to April 2015. The Final report was submitted in June 2015.

Some observation and recommendation provided by MTR review as follows:

- There is a lack of ownership and understanding of the Project at national level.

Recommendation: *Ad hoc Project advisory committees (formal or informal) should be formed at regional or sub-regional level to enhance the involvement of Government officials in Project activities and to provide a forum for these stakeholders to influence activities and approaches.*

- The Project has been short of key staff at Sub-regional level and it has not effective in utilization of budget to strengthen project management capacity.

Recommendation: *The Project management should review possibilities to appoint Project Focal Points (either salaried or not salaried) at key national Government agencies in Member Countries. The tasks for focal points would include liaison between the Project and the Government central and local agencies and NGOs engaged in project implementation*

- Ineffective information dissemination and coordination mechanism with fisheries related ASEAN's bodies were identified which weaken SEAFDEC status in ASEAN, being its technical arm.

Recommendation: *SEAFDEC is recommended to evaluate existing mechanisms and instruments for communication and disseminating information to related ASEAN's fisheries bodies in order to strengthen its role as technical arm.*

- The impact on local level is limited and the number of NGOs engaged in Project activities is too few for the Project to be able to demonstrate contributions to improved social well-being.

Recommendation: *The Project management should enhance local level activities, by engaging more NGOs in more localities,*

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

Project/Activity Title	Duration	Remarks
To address the components above, expected events to be carried out in 2016: 1. Continued the process of the collaboration between neighboring countries in 4 sub-regions (Gulf of Thailand, Andaman Sea, Mekong river, and Sulu-Sulawesi Seas) through the conduct of the bilateral dialogue, sub-regional meetings, Consultation and workshop, etc.	Jan-Dec	

Project/Activity Title	Duration	Remarks
2. Regional Cooperation to Promote Sustainable Utilization of Neritic Tuna Resources in Southeast Asia Waters 2.1 3 rd Meeting of the Scientific Working Group Meeting on Neritic tuna meeting 2.2 Improve data collection for Neritic Tuna focusing tonggol tuna, kawakawa, etc. 2.3 Genetic study (will be led by SEAFDEC/MFRDMD) 2.4 Capacity building on EAFM for Neritic Tuna via Training and information dissemination, awareness building: Thailand, Viet Nam, Indonesia, Malaysia, the Philippines	Jan-Dec	
3. Regional Consultations on Regionalized Small Scale Fisheries in the ASEAN		
4. Field-level work: More sub-contracts drafted and/or signed for field work and capacity-building in follow-up to requests from member countries and as recommended during sub-regional consultations.	Jan-Dec	
5. 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.	Jan-Dec	
6. 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.		
7. 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).		
<i>Note: Aspects of climate change, gender will be integrated in all outputs groups as a cross-cutting matter to be considered.</i>		

Annex 5

NEW PROPOSED PROJECTS FOR THE YEAR 2016 AND ONWARDS

Project	Lead Department	Period	Appendix No.
Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (ASEAN-SEC/IDB/ SEAFDEC)	MFRDMD	2015-2017	1
USAID-SEAFDEC “Oceans and Fisheries Partnership”	SEC	2015-2019	2

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

Project id: 2015040104			
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management		
Program Thrust:	Program Thrust No.	Total Duration:	2015 - 2017
Lead Department:	MFRDMD	Lead Country:	Malaysia
Donor/Sponsor:	IDB	Total Donor Budget:	USD 250,000
Project Partner:	SEAFDEC/Sec	Budget for 2016:	USD 125,000
Project leader:	Ms. Mazalina Ali	Involved Country	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 utilised 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. In respond to the tragic incident, ASEAN community adopted "**ASEAN Declaration on Action to Strengthen Emergency Relief, Rehabilitation, Reconstruction and Prevention on the Aftermath of Earthquake and Tsunami Disaster of 26 December 2004**" as their policy commitment to support Tsunami affected people. The coastal villages throughout the region are also facing hardships due to the impact from climate change such as sea level rise, increase of sea temperature, change of fish habitat and its ecosystem, natural hazards, etc. The ASEAN-SEAFDEC Member Countries have put a serious concern on this issue and recently identified the **required adaptive measures and activities to mitigate the impacts of climate change** to be undertaken by SEAFDEC and the national agencies responsible for fisheries in the Member Countries. In addition, Indonesia as the lead country also prepared a proposal on the **ASEAN Strategy Addressing the Impact of Climate Change on Agriculture, Forestry and Fisheries**, for further submission to the SOM-AMAF.

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.

(a) Problem Analysis

Fishing related coastal communities often demonstrate high levels of vulnerability, many small-scale fishing families are increasingly caught in a poverty trap. This situation could be reasoned from a variety of factors including dependence on dwindling coastal resources, unpredictable nature of fishing, high occupational risk, sensitivity to macro-economic changes, exposure to natural disasters, high competition from multi-resource users; and social, economic and political marginalization.

The growing domestic and international demand for fish and fish products has resulted in the excessive exploitation of aquatic resources in the region. The number of small fishermen keeps increasing; the size and number of coastal villages are becoming larger and larger. Whenever the fishery resources are threatened, it is definitely impact to the Muslim coastal communities where their livelihoods depend very much on coastal resources. The local income of coastal fishery communities and people involve in fisheries associated activities (*i.e.* fish processing, marketing, boat building, net making, etc.) are determined by coastal resources for a significant part of their livelihoods. The fishermen have to compete with both people and natural resources, the fishermen therefore continuously intensify their fishing efforts

to maintain a status quo. This leads to the tragedy of resources utilization which the fishermen are driving resources down both in terms of quality and quantity; and they will be finally caught in a poverty trap.

Apart from the degradation of fishery resources, biophysical and socio-economic condition in the coastal zone is highly vulnerable to the impacts of climate change and natural such as erosion, cyclone, sea-level rise, increases in sea-surface temperature and unpredictable effects of climate change on the coastal environments changes (*i.e.* natural hazards, resources productivity, degradation of habitat and ecosystem, etc.). These climate change-related stresses could increase risk of coastal fisheries communities and effect to the development of fisheries more difficult in improving people livelihood and ensuring food security as well as addressing on fisheries management approach. These could bring about degeneration of economic well-being, risk in safety and efficiency of fishing operation, lost of fish caught, as well as implication on employment and vital source of protein for poor people. To assist the fisheries communities from these subsequence, there is a need to build up community resilience in coping with such cases.

Coastal dwellers are facing degradation of fishery resources, at risk of natural disaster, dealing with low standard of living and poverty. Many fisher communities are outside of any social safety net systems that may exist in other areas of the country. Thus, the need to strengthen community fisheries organization and capacity building for better development and management of the coastal resources to ensure sustainable livelihood of coastal communities, has become very urgent. It is indeed important that appropriate coastal resources management, alternative livelihoods as well as research and development for simple early warning system at local community level should be put in place.

This project aims to improve the socio-economic status of the coastal dwellers through community fisheries organization and governance in order to the coastal resources utilized by the fishermen could continue to sustain its function as the source of food for the region's fishing communities. The target beneficiaries of this project are the Muslim communities in the region's coastal areas.

(b) Regionality

As aforementioned the ASEAN region is home to the largest Muslim populations in the world, majority of occupation in the Muslim coastal communities is mostly characterized by small-scale fisheries and associated activities. It is noteworthy that the role of small-scale fisheries has contributed to the large amount of fisheries production within the fisheries sector. It is also recognized that fisheries play an important direct role in livelihoods, food security, national economic growth and foreign exchange earnings. The Member of ASEAN Countries, main exporters of fish products to the world market, is unquestionably count upon the production from coastal communities. Degradation of fishery resources, impacts of climate change, global economic crisis in 2008 and vulnerability of the coastal communities could bring about the retard of national economic growth and would be more difficult to strengthen regional economic integration by fisheries sector.

The ASEAN Member Countries should address the issue and build up firm foundation for coastal community through policies and institutions as well as local levels of governance of natural resources utilization to ensure effective co-management between the local government and the communities. The most of the projects have usually been implemented as national programs with appropriate national policy. However, if the program is appropriately focus on the issues and to facilitate exchange of experiences among the participating countries (regional approach) and to develop the common stand and concerns on the subjects may greatly promote the issues in the region.

(c) Participation

For the project implementation, high priority will be given to ASEAN IDB countries with the highest Muslim populations, such as Indonesia, Malaysia, and Brunei Darussalam (88%, 59% and 67% Muslim populations, respectively). Other Muslim communities in non IDB countries namely, the Philippines, Thailand and Cambodia will also benefited from the project implementation through technology transfer and dissemination of experiences learned by the three priority countries considering their respective problems and needs.

(d) Beneficiaries

The direct beneficiaries are the people in the eight selected coastal Muslim communities in ASEAN region. Communities will be selected based on criteria identified by the project. In order to support capacity building activities, approximately 160 fishers, 25 local fishery officers and other personnel working in support of fishery communalities will be involved in the project activities. On the other hand, experiences and lesson learn during the conduct of project activities and outcomes of the project implementation could be useful for strengthening of national policy in supporting coastal fisheries communities in respective ASEAN Member Countries.

(e) Relevant ASEAN-SEAFDEC Resolution, Policies and Plans of Action

This project are relevance to the ASEAN Community Blueprints *i.e.* Strengthening entrepreneurship skills for women, youth, elderly and persons with disabilities (A.6), Poverty alleviation (B.1), and Promoting the sustainable use of coastal and marine environment (D.7), Promoting Sustainable Management of Natural Resources and Biodiversity (D.8).

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:

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

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: a. One workshop report. One survey report.	Activity 1: Community Surveys and Needs Assessment
	Outcome 2: The community fisheries associations will be strengthened	Output 2: One capacity building workshop report per country	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 workshop report per country.	Activity 3: Capacity Building on Sustainable Livelihoods and Coastal Resource Management
Objective 3: To monitor and evaluate the progress of the project	Outcome 4: Final project evaluation report.	Output 4: a. 3 progress reports. Final project report.	Activity 4: Project Management and related Contingency

3.2 Overall Scope/Description of Project

Activity	Description
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) special topic surveys <i>i.e.</i> fish markets, surveys on existing local organizations (types, numbers and activities), climate change/natural disasters impact assessment surveys; and data collection on the impact of the TA; (c) using the survey results, this activity will identify and prioritize community activities for technology transfer and human resource development. Expected deliverables from this activity are: (i) needs assessment and baseline survey report, (ii) special survey reports, (iii) semi-annual M&E (monitoring & evaluation) reports, and (iv) final evaluation report on coastal community resilience and outcomes of the Project. 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 and facilitating the formation of new associations. The community fisheries associations will be capacitated to take a leading role in promoting community food security, developing job opportunities, engaging environment- friendly coastal management practices, and developing strategies for simple natural disasters early warning system. The activity will be implemented through a series of training sessions, workshops and consultative meetings focusing on the following: orientation for associations on organizational functions and responsibilities, 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; fish releasing, promotion of One-Village One Fisheries Product scheme; introducing higher productive fish; and improving efficiency in fishing, postharvest techniques and fish marketing; (b) enhancing community business ventures: facilitating formation of cooperative dry goods grocery stores, training on Islamic microfinance schemes and capacity building in financial and business management; (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. In addition, this activity will also help the communities develop and adopt measures for mitigation to the impacts of climate change and building people's capacity to reduce their vulnerability to natural disasters. This sub-activity covers education on impacts of climate change, training on safety at sea for small-scale fishermen, development of simple early warning system, 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 and supplies needed to install fish aggregating devices.
Activity 4: Project Management and related	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

Activity	Description
Contingency	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

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017
Activity 1: Community survey and needs assessment	Sub-activity 1.1: Workshop for project planning and preparation of community survey questionnaires	7,500		-
	Sub-activity 1.2: Project inception meeting and establishment of project implementation committee (5) for each of the 3 IDB countries	7,500		-
	Sub-activity 1.3: Baseline Survey on demographic, economic and other indicators	-	11,000	-
	Sub-activity 1.4: Special topic survey <i>i.e.</i> fish markets, survey on existing local organizations	-	11,000	-
	Sub-activity 1.5: Identify and prioritize community activities for technology transfer and human resource development	-	740	-
Activity 2: Building and Strengthening of Fisheries Associations	Sub-activity 2.1: Training focusing on orientation for associations on organizational functions and responsibilities	-	15,000	-
	Sub-activity 2.2: Workshop focusing on orientation for associations on organizational functions and responsibilities	-	15,660	-
	Sub-activity 2.3: 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	-	33,000	-
Activity 3: Capacity Building of Coastal Communities on Sustainable Livelihoods and Resource Management	Sub-activity 3.1: Knowledge transfer and training on improving governance, resource use practices and diversifying fish production systems	-	15,000	19,520
	Sub-activity 3.2: Knowledge transfer and training on enhancing community business ventures and promoting alternative livelihood	-	15,000	19,520
Activity 4: Project Evaluation and Reporting	Sub-activity 4.1: Progress meeting	-	30,000	15,000
	Sub-activity 4.2: Project terminal workshop	-	-	33,330
	Sub-activity 4.3: Project evaluation	-	-	1,230
	Sub-Total Budget	15,000	146,400	88,600

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

The inception meeting and workshop for project planning and preparation of community survey questionnaires will be conducted on early December 2015 that involved participants from Brunei Darussalam, Indonesia, Malaysia and officials from SEAFDEC/MFRDMD and SEAFDEC/Sec.

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. Community survey and needs assessment					
<u>Sub-activity 1.1</u> Workshop for project planning and preparation of community survey questionnaires	O	15	10	-	0 (meeting will be held in December 2015)
<u>Sub-activity 1.2</u> Project inception meeting and establishment of project implementation committee	O	15	10	-	

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1 Community survey and needs assessment		
<u>Sub-activity 1.1</u> Workshop for project planning and preparation of community survey questionnaires	Workshop for project planning and preparation of community survey questionnaires for baseline and special topics	MFRDMD will invite experts and all project implementation committee from 3 IDB countries in December 2015 for planning and preparation of baseline and special topics questionnaires for community survey.
<u>Sub-activity 1.2</u> Project inception meeting and establishment of project implementation committee	Project inception meeting and establishment of project implementation committee (5) for each of the 3 IDB countries	MFRDMD will invite all project implementation committee from 3 IDB countries in December 2015 for project inception meeting and establishment of project implementation committee that will have 5 members for each of the 3 IDB countries.

4. List of Completed Publications and Others

List of completed publications for the year 2015	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	
Sub-activity 1.1	The meeting will be held in December 2015.
Sub-activity 1.2	The meeting will be held in December 2015.

6. Major impacts/issues

Effective coordination of several government agencies and fishing community should be considered.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016**1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016**

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1:		
Sub-activity 1.3:	Baseline Survey on demographic, economic and other indicators	11,000
Sub-activity 1.4:	Special topic survey <i>i.e.</i> fish markets, survey on existing local organizations	11,000
Sub-activity 1.5:	Identify and prioritize community activities for technology transfer and human resource development	740
Activity 2:		
Sub-activity 2.1:	Training focusing on orientation for associations on organizational functions and responsibilities	15,000
Sub-activity 2.2:	Workshop focusing on orientation for associations on organizational functions and responsibilities	15,660
Sub-activity 2.3:	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	33,000
Activity 3:		
Sub-activity 3.1:	Knowledge transfer and training on improving governance, resource use practices and diversifying fish production systems	15,000
Sub-activity 3.2:	Knowledge transfer and training on enhancing community business ventures and promoting alternative livelihood	15,000
Activity 4:		
Sub-activity 4.1:	Progress meeting for each of 3 IDB country	30,000

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1:	
Sub-activity 1.3:	Baseline Survey report.
Sub-activity 1.4:	Special topic survey report.
Sub-activity 1.5:	Identification of community activities for technology transfer and human resource development.
Activity 2:	
Sub-activity 2.1:	Training report for fisheries associations in 3 IDB countries.
Sub-activity 2.2:	Workshop report for fisheries associations in 3 IDB countries.
Sub-activity 2.3:	1 capacity building for community leaders for each 3 IDB countries.
Activity 3:	
Sub-activity 3.1:	1 report on knowledge transfer and training on improving governance, resource use practices and diversifying fish production systems for each of 3 IDB countries.
Sub-activity 3.2:	1 report on knowledge transfer and training on enhancing community business ventures and promoting alternative livelihood for each of 3 IDB countries.
Activity 4:	
Sub-activity 4.1:	Progress meeting for each of 3 IDB countries

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 1:												
Sub-activity 1.3:												
Sub-activity 1.4:												
Sub-activity 1.5:												
Activity 2:												
Sub-activity 2.1:												
Sub-activity 2.2:												
Sub-activity 2.3:												
Activity 3:												
Sub-activity 3.1:												
Sub-activity 3.2:												
Activity 4:												
Sub-activity 4.1:												

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

		Project id: 2015060104	
Program Categories:	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
Project Title:	USAID-SEAFDEC “Oceans and Fisheries Partnership”		
Program Thrust:	Special Project	Total Duration:	14 May 2015 to 13 May 2020
Lead Department:	SEC, TD	Lead Country:	TBD
Donor/Sponsor:	USAID	Total Donor Budget:	USD 19,953,000
Project Partner:	USAID, SEAFDEC, CTI-CFF	Budget for 2016:	USD 4,365,514
Project Leader:	Geronimo Silvestre	Involved Country	ASEAN and CTI-CFF Countries

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description

Southeast Asia’s fisheries are in a state of overcapacity, and that overfishing combined with IUU and destructive fishing are causing fisheries to decline, if not collapse, leading to devastating consequences for regional food security and marine biodiversity.

The goal of the Oceans and Fisheries Partnership (USAID Oceans) project is to strengthen regional cooperation for sustainable and legal management and trade of natural resources in the Asia Pacific region. The objectives include developing a financially sustainable regional catch documentation and traceability (CDT) system to combat IUU fishing and seafood fraud in areas where sustainable fisheries management plans (SFMPs) are being applied; expanding the CDT system to priority biodiversity areas in the Asia Pacific region; strengthening human and institutional capacity of regional organizations to conserve marine biodiversity through SFMPs; and enhancing public-private partnerships (PPPs) to conserve biodiversity, promote sustainable fisheries management, and combat IUU fishing and seafood fraud.

The implementing organization is a USAID contractor, Tetra Tech.

Key project activities include:

- Develop a transparent and financially sustainable CDT system and complementary SFMP.
- Demonstrate the system at sites in the Sulu-Celebes Seas.
- Expand the system to areas important for biodiversity in the Asia-Pacific region.
- Strengthen the capacity of, and coordinate with, regional and national organizations to conserve biodiversity using the system.
- Engage the public and private sectors to ensure system uptake and sustainability.

Expected outputs of the project for year 2016:

- SEAFDEC Regional Technical Groups strengthened and engaged in electronic CDT development to support combating IUU fishing;
- Concept, design, and architecture of a CDT minimum viable product developed and being implemented in two demonstration sites where SFMP is being supported;
- Relevant public and private sector stakeholders (including women and vulnerable groups and champions) engaged in support of the CDT design and adoption process and SFMP implementation; and
- Expansion and replication strategy for the CDT system defined with SEAFDEC and other relevant partners.

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, and that overfishing combined with IUU and destructive fishing are seriously degrading the highest marine biodiversity area on the planet and causing fisheries to decline, if not collapse. The decline and failure of the regional fisheries will ultimately have devastating consequences for regional food security. The project will support 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: Developed a financially sustainable regional catch documentation and traceability (CDT) system 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 demonstration fisheries/sites	Activity 1: Implement a Financially Sustainable Catch Documentation and Traceability System with Complementary SFMP in Regional Demonstration Sites
Objective 2: Expanded use of the CDT system to priority biodiversity areas in the Asia Pacific region	Outcome 2: Overcapacity and IUU fishing in expansion areas reduced	Output 2: CDT system with complementary SFMP rolled out in expansion areas/fisheries	Activity 2: Expand Implementation of the CDT System and SFMP in Areas Important for Biodiversity in the Asia-Pacific Region
Objective 3: Strengthened 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 CDT system and complementary SFMP	Output 3: Trainings and capacity-building regional and national organizations in CDT and SFM planning	Activity 3: Strengthen Capacity of Regional and National Organizations to Conserve Biodiversity using CDT Systems and Complementary SFMP
Objective 4: Enhanced 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 CDT system to combat overcapacity and fishing	Output 4: Private and public sector partnership and investments in CDT system and SFMPs	Activity 4: Engage the Public and Private Sector to Enhance Fisheries Sustainability, CDT/SFMP Uptake and Coordination with Regional Stakeholders

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1: Implement a Financially Sustainable Catch Documentation and Traceability System with Complementary	The Oceans and Fisheries Partnership will develop a CDT system consistent with the ASEAN Catch Documentation Scheme and complementary SFMP in regional demonstrations, strengthen sustainable fisheries management in the Sulu-Celebes Sea, focusing on two demonstration fisheries, and implement the CDT system in an SFMP

Activity	Description
SFMPs in Regional Demonstration Sites	framework at the two demonstration fisheries.
Activity 2: Expand Implementation of the CDT System and SFMP in Areas Important for Biodiversity in the Asia-Pacific Region	The Oceans and Fisheries Partnership will identify areas with high value for biodiversity through a consultative process, collaborate with other USAID and donor projects in the region, engage in consultation and behavior change communication to foster uptake of the CDT system, ensure sustainability at the regional level, determine an entity to house the CDT and establish system management, quality and financial sustainability goals.
Activity 3: Strengthen Capacity of Regional and National Organizations to Conserve Biodiversity using CDT Systems and Complementary SFMP	The Oceans and Fisheries Partnership will engage with ASEAN, SEAFDEC, CTI-CFF and regional fisheries stakeholders, partner with existing regional platforms, and capacitate national focal platforms and agencies.
Activity 4: Engage the Public and Private Sector to Enhance Sustainability, CDT/SFMP Uptake and Coordination with Regional Stakeholders	The Oceans and Fisheries Partnership will coordinate with regional stakeholders and work to develop and implement public-private partnerships to enhance fisheries sustainability and CDT/SFMP uptake.

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

(Unit: USD)

Activity	Sub-Activity	Y1 2016	Y2 2017	Y3 2018	Y4 2019	Y5 2020
Activity 1: Implement a Financially Sustainable Catch Documentation and Traceability System with Complementary SFMPs in Regional Demonstrations	Sub-activities 1.1-1.17 address: Research and studies to inform activities; Development of CDT system; Testing of System; Preparation for piloting in two demonstration site including Sustainable Fisheries Management Planning and Capacity Building; and Piloting in two demonstration sites	1,750,000	1,250,000	350,000	150,000	150,000
Activity 2: Expand Implementation of the CDT System and SFMP for Areas Important in Biodiversity in the Asia-Pacific Region	Sub-activities 2.1-2.6 address: Identifying areas with high value for biodiversity; Collaborating with USAID and donor projects; Initiating communication to foster uptake of CDT system; Commencing regional system sustainability analyses; Determining entity to house the CDT; Establishing CDT system management, quality and financial sustainability goals	1,232,388	2,224,081	2,325,148	2,298,450	1,548,955

Activity	Sub-Activity	Y1 2016	Y2 2017	Y3 2018	Y4 2019	Y5 2020
Activity 3: Strengthen Capacity of Regional and National Organizations to Conserve Biodiversity using CDT Systems and Complementary SFMP	Sub-activities 3.1-3.3 address: Engaging with regional fisheries organizations, Conducting trainings; Engaging women's groups	507,979	710,000	952,000	957,000	517,000
Activity 4: Engage the Public and Private Sector to Enhance Sustainability, CDT/SFMP Uptake and Coordination with Regional Stakeholders	Sub-activities 4.1-4.8 address: Rapid partnership appraisal; Partnership prioritization, Partnership validation and planning; Partnership engagement plan; Capacity strengthening for industry associations and fisher organizations to provide input on the CDT and SFMP; Engagement of regional private sector and partnership platforms; Advancement of regional fisheries governance; Improving capacity of regional organizations to partner effectively	875,147	670,884	603,062	441,778	439,128
	Total Budget	4,365,514	4,854,965	4,230,210	3,847,228	2,655,083

*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 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the Present Year

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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					
Activity 2					
Sub-activity 2.1					
Sub-activity 2.2					

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
Activity 3					
Sub-activity 3.1					
Sub-activity 3.2					
Activity 4					
Sub-activity 4.1					
Sub-activity 4.2					

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

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.1		
Sub-activity 1.2		
Activity 2		
Sub-activity 2.1		
Sub-activity 2.2		
Activity 3		
Sub-activity 3.1		
Sub-activity 3.2		
Activity 4		
Sub-activity 4.1		
Sub-activity 4.2		

4. List of Completed Publications and Others

List of completed publications for the year 2015	Type of media	Attached e-file
No		

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

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1	
Sub-activity 1.2	
Activity 2	
Sub-activity 2.1	
Sub-activity 2.2	
Activity 3	
Sub-activity 3.1	
Sub-activity 3.2	

6. Major Impacts/Issues

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PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016*

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1. Implement a Financially Sustainable Catch Documentation and Traceability System and Complementary SFMPs in Regional Demonstrations	The core component of the work under USAID Oceans is the development of a CDT and FIS system for Southeast Asia. USAID Oceans will focus for the first two years of the activity's life on the development of a financially sustainable CDT system and an FIS that supports approaches to and planning for improved fisheries management in the Sulu-Celebes Seas. Sustainable Fisheries Management Plans (SFMPs) will be the umbrella framework for management, designed in consultation with local stakeholders. A Catch Documentation and Traceability system will be developed and tested in the field to document harvest and to inform sustainable management.	1,750,000
<u>Sub-activity 1.1</u> Conduct a requirements matrix for an integrated approach to catch documentation, traceability, and fisheries information systems architecture	<p>A key objective is to support efforts to design common technology architecture for the CDT and fisheries information systems in promoting electronic technologies required for effective fisheries management, providing trip declarations, electronic CDT data information, electronic observer (EO) technologies, and beneficiary communications services. These will support enhanced safety and welfare of fishers, regulatory compliance, sustainability, optimization of fishing capacity and fishing effort, environmental monitoring, and data analysis. It will allow for production of actionable information and real-time decision making.</p> <p>In Months 2-6, the CDT Specialist will identify the preferred technologies and develop a requirements matrix for the electronic CDT system. The purpose is stakeholders' agreement on the scope, specifications, design and plan for the implementation of the integrated CDT and fisheries information systems.</p>	
<u>Sub-activity 1.2</u> Conduct an adoption analysis of CDT systems	<p>The CDT system will be required to validate the capture of critical tracking events and key data elements, and maintain chain of custody at each point in the seafood supply chain to meet the minimum track and trace requirements. The system will adhere to recognized industry standards, and support human data input methodologies using mobile devices in the Asia-Pacific context to enable data sharing throughout the seafood distribution channel in developing fish-stock traceability solutions enhancing value through for-profit and non-profit platforms in the supply chain.</p> <p>In Months 4-7, the CDT Specialist and Senior PPP Advisor (with COP oversight) will undertake a scoping study to assess the current state of traceability data today in the Asia-Pacific region. They will conduct a gap analysis between the current state and the desired state to support a development path.</p>	
<u>Sub-activity 1.3</u> Conduct an adoption analysis of fisheries information systems	National governments in the Asia-Pacific region will need to develop FISs providing effective information and data sharing and support the International Plan of Action	

Proposed Activity	Description of Proposed Activity	Proposed Budget
architecture	<p>(IPOA) on IUU fishing. The fisheries information system will allow stakeholders to:</p> <ul style="list-style-type: none"> - Meet national requirements. - Improve policy, capacity, monitoring, compliance, surveillance, and chain of custody. - Improve fisheries governance. - Establish linkages in support of global, regional, and sub-regional conservational and management measures, international plans of action and effective fisheries information systems and data sharing which will support the implementation of Port State Measures. <p>The Fisheries Management Specialist and CDT Specialist (with COP oversight) will conduct a scoping study to assess the current state of FISs in the Asia-Pacific region and conduct a gap analysis.</p>	
<p><u>Sub-activity 1.4</u> Conduct an adoption analysis of safety and beneficiary communications requirements and their impact on CDT technologies and services</p>	<p>Concurrent and contributing to the design of the catch documentation and traceability and fisheries information system shall be an adoption analysis of technologies that can be used to effectively support fishers safety (use of safety reporting and distress responses) and beneficiary communications (use of social media services for communications and commerce) and information services (use of safety, weather forecasts, oceanographic and fisheries advisory services) to use data and services from the different available platforms to achieve the goals for the improvements safety and emergency response services and improving crew welfare and working conditions that can be integrated into the ASEAN member states catch documentation and traceability and fisheries information systems across the region.</p> <p>The COP and CDT specialist shall undertake a scoping study to assess the current state of fisheries information systems data today in the ASEAN context and perform a gap analysis between the current state, the desired state, and make recommendations in order to support national, regional and sub-regional capacity building development objectives.</p>	
<p><u>Sub-activity 1.5</u> Conduct an adoption analysis of electronic monitoring, electronic reporting, and remote sensing components to support planned CDT, FIS, and MCS components</p>	<p>Concurrent and contributing to the design of the catch documentation and traceability and fisheries information system shall be an adoption and migration analysis of electronic reporting, electronic monitoring (including future electronic observer) technologies and remote sensing services (oceanographic, weather, surveillance patrols, and IUU detection), that can be used to effectively support and strengthen fisheries governance, compliance, conservation and management measures and information services to use data and services from the different available platforms to achieve the goals for the improvements that can be integrated into the ASEAN member states catch documentation and traceability, fisheries information systems, MCS and MDA programs across the region.</p> <p>The COP and CDT specialist shall undertake a scoping study to assess the current state of fisheries information</p>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	<p>systems data today in the ASEAN context and perform a gap analysis between the current state, the desired state, and make recommendations in order to support national, regional and sub-regional capacity building development objectives.</p>	
<p><u>Sub-activity 1.6</u> Conduct an adoption analysis of CDT technologies and standards for tracking of fair and legal labor in the fisheries capture component of the supply chain</p>	<p>Concurrent and contributing to the design of the catch documentation and traceability and fisheries information system shall be an adoption and migration analysis of electronic reporting and electronic monitoring that can be used to effectively support and strengthen fair and legal labor governance compliance, management and use data and services from the different available platforms to achieve the goals for the improvements that can be integrated into the ASEAN member regulatory systems across the region.</p> <p>The COP and CDT specialist shall undertake a scoping study to assess the current state of fair and legal labor practices in the ASEAN context and perform a gap analysis between the current state, the desired state, and make recommendations in order to support national capacity building development objectives.</p>	
<p><u>Sub-activity 1.7</u> Conduct an adoption analysis of information and communications technologies</p>	<p>The CDT Specialist, Fisheries Management Specialist and Senior PPP Advisor (with COP oversight) will review information and communications technologies (ICT), and standards for use in the demonstration sites. USAID Oceans will then adopt a working list of principles, functionalities, and likely technologies the CDT and FIS systems should adopt today in the Asia-Pacific context and conduct a gap analysis between the current state and the desired state to support national, regional, and sub-regional skills; knowledge transfer; and capacity-building development objectives.</p>	
<p><u>Sub-activity 1.8</u> Draft RFP and award sub-contract of the CDT MVP</p>	<p>The CDT Specialist and Fisheries Management Specialist (with COP oversight) will draft the terms of reference and technical specification for the development of a CDT MVP to facilitate interoperability of CDT and fisheries information systems, initiate testing and evaluation trial programs, and provide monthly progress reports.</p>	
<p><u>Sub-activity 1.9</u> Conduct a CDT technology review and innovation forum</p>	<p>Concurrent to the design of the CDT and FIS will be an adoption analysis of technologies to effectively support data input, and capture methodologies to use data from the different available platforms to achieve the goals of the integrated countries' FIS and CDT systems. USAID Oceans will compile information on the cost of different technologies, projected five-year total operating costs, and cost recovery methodologies and models if adopted and used.</p> <p>The CDT Specialist and Senior PPP Advisor (with COP oversight) will conduct research and interviews with technology providers, regulators, and industry stakeholders. This will culminate with the hosting of a regional innovation forum and workshop with stakeholders and prospective ICT technology partners to design interoperability and participate in the program development.</p>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
<p><u>Sub-activity 1.10</u> CDT data exchange proof of concept</p>	<p>Stakeholders in the seafood industry in the region are heavily focused on improving traceability processes. The benefits of these enhancements allow for product sustainability and integrity, in addition to increased consumer awareness and government activity, there are also industry expectations that organizations within the seafood supply chain need to understand traceability concepts, and demonstrate how they manage traceability data.</p> <p>The USAID Oceans FIS and CDT systems will be an open-source collaborative development providing a reference implementation that can be adopted by and contributed to by multiple stakeholders for supporting regulators, processors, service providers and supply chains.</p> <p>The model will be of countries in the region developing capacity and exchanging information. Exchange will be at the national level, regional level or via data exchange (CDTeX) on a peer-to-peer basis, country-to-country, country-to-RFMO, or country-to-FAO. Exchange will be controlled and secure, and data replication must be supported under each scenario compliant with national sovereignty. A trusted regional host organization should provide management.</p> <p>The CDT Specialist will design, deploy, and supervise a pilot program of the MVP product based on a minimum technology adoption threshold. The threshold will be determined by a gaps analysis of the data collection in the supply chain and a risk assessment of adoption in the designated FMPs and FMZ.</p>	
<p><u>Sub-activity 1.11</u> Conduct a value chain analysis to determine the business case for different information on catch</p>	<p>USAID Oceans will conduct a value chain analysis (see also 4.3.6 below) to determine the various points of leverage in key markets for data about a catch (<i>i.e.</i>, species, freshness, sourcing, catch method, and marketing method), and the critical actors in the value chain. This information will be used as inputs to the cost-benefit analysis, the next activity.</p>	
<p><u>Sub-activity 1.12</u> Conduct a feasibility/cost-benefit analysis of the technologies available for different users and audiences</p>	<p>Using the compiled list of technologies, and their cost and benefits on an open market if implemented, USAID Oceans will conduct a cost-benefit analysis of the available technologies for inclusion in the initial iteration of the FIS. Technology groups (<i>i.e.</i>, functional systems) will be classed as cost-effective, potentially cost-effective, or not cost-effective presently.</p> <p>If and when technology groups are not cost-effective but crucial to achieve goals identified for the SFMP, USAID Oceans will work to develop a mechanism to finance the technologies adoption and maintenance after the life of project. This might include corporate social responsibility campaigns, continued government or donor support, and/or user fees bundled with access to services within the FIS.</p>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
<p><u>Sub-activity 1.13</u> Contract partners to implement selected technologies</p>	<p>USAID Oceans will contract with Southeast Asian companies and entities where possible to implement the initial nodes of the fisheries management system. The CDT Specialist will be tasked with identifying these companies and will work closely with Tetra Tech's home office and the RDMA to produce the needed tools. These tools will be produced as they are vetted, designed for engagement using the data standards developed in the first months of the activity.</p>	
<p><u>Sub-activity 1.14</u> Integrate CDT with components of FIS with SFMP and stakeholders for feedback and adaptation loop</p>	<p>Throughout the development of the CDT and fisheries information system, the CDT Specialist will be in regular consultation with other team members and engaged in the design of the SFMP support efforts in the zones of the demonstrations. Early mock-ups and beta versions of the system will be tested in the zone of the demonstration during the design and adoption analyses phase of the effort, in the initial several months of the activity. The CDT Specialist and USAID Oceans key personnel will engage in early and continuous engagement with stakeholders to educate and inform them about the activity, their role and participation, and impact.</p> <p>The CDT system and fisheries information system components will be provided as minimum viable product (MVP) functional demonstration release versions of component systems for CDT. The focus thereafter will be almost exclusively on ensuring the adoption and sustainability of the platform after the end of the program life.</p>	
<p><u>Sub-activity 1.15</u> implement the catch documentation system in an EAFM framework using fishery improvement projects for demonstration</p>	<p>The testing ground for the FIS will be demonstration fisheries within the region where USAID Oceans or other partners are supporting the EAFM. Tetra Tech will make its final selection in consultation with USAID, SEAFDEC, and CTI-CFF. Our initial proposition is to target two key fisheries in the SSME. Each will have a key constellation of PPPs, grants, fisheries-specific technologies, and interventions. Each may be implemented using the framework provided by the Fisheries Improvement Protocol (FIP) for ASEAN, of which our Senior PPP Advisor played a key role in development.</p>	
<p><u>Sub-activity 1.16</u> strengthen sustainable fisheries management in the Sulu-Celebes Sea, focusing on two demonstration fisheries</p>	<p>Strengthening the SFMP framework in the Sulu-Celebes Sea will be USAID Oceans' point of entry in the region. As a comprehensive management framework, a SFMP will rationalize the approach for the entire endeavor.</p>	
<p><u>Sub-activity 1.17</u> Meet with USAID and OCC to confirm regions and fisheries for demonstrations</p>	<p>The USAID Oceans activity team will hold consultations on the proposed Sulu-Celebes Sea integrated management unit (IMU) and SFMP with SEAFDEC, relevant regional entities, national/local agencies and authorities, and members of the OCC. The objective will be to finalize the fisheries and the locations of the demonstration sites.</p>	
<p>Sub-activity 1.18 Strengthen and implement SFMP in a consultative process with stakeholders</p>	<p>The USAID Oceans team will conduct stakeholder consultations on the selection of demonstration sites and fisheries. The team will also establish a long-term consultative group to inform interventions in the demonstration sites. USAID Oceans will design the FIS,</p>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	including the CDT node, to support and achieve the goals identified by its consultations, and to move forward with the implementation of an SFMP framework within the Sulu-Celebes Sea.	
<u>Sub-activity 1.19</u> Strengthen and implement SFMP in a consultative process with regional stakeholders	After the initial consultations in the Sulu-Celebes Sea, USAID Oceans will have identified regions and fisheries for its demonstrations, and focus its efforts on establishing or building upon an IMU for SFMP at a scale appropriate for the maturity, efficacy, and degree of integration at different levels of governance in the region. The team will build on the 2014 stakeholder analysis conducted by the USCTI Program and continue with local stakeholder engagement to assess interest and commitment, and begin organization, awareness raising, and other communications on SFMP and CDT.	
<u>Sub-activity 1.20</u> Identify and prioritize gaps in policy, information, management and coordination	<p>Within the IMU, the Demonstration Site Managers will lead the effort to identify and engage key stakeholders involved in setting policy or engaged in the management of natural resources. Once these stakeholders are identified, the Fisheries Management Expert will engage with them to develop a rapid assessment (using the RAFMS methodology) of the key gaps and needs to further the SFMP. This will be complemented by engagement of the COP, the Senior PPP Advisor, and the Gender Integration Specialist with targeted engagement to evaluate opportunities within the IMU to improve management. The output of this activity will be an assessment of the key gaps in the SFMP that USAID Oceans could feasibly address.</p> <p>At the conclusion of the activity, USAID Oceans will convene stakeholders in the IMU to evaluate and validate the SFMP gap assessment. This will take the form of a draft document released for public comment and a workshop with a limited number of key stakeholders.</p>	
<u>Sub-activity 1.21</u> Conduct a value chain analysis for the fisheries in the demo sites and link the SFMP to the CDT system	USAID Oceans will carry out and cooperate with the Swedish Aid Agency on a gender sensitive value chain analysis for each marine species in the demonstration sites. The value chain analysis (VCA) will link closely with the SFMP planning and governance assessment process, CDT system planning process and the SFMP and CDT system data needs assessment. USAID Oceans will also explore data collection needs and protocols in the target value chains to inform the development of FIS that will enrich fisheries data collection for fisheries management and performance tracking.	
<u>Sub-activity 1.22</u> Co-develop goals and benchmarks for gender and labor transparency and equality, and a plan to reach them	The gender integration specialist will work with and supervise Ocean's key partner Verité to identify key human welfare goals in the development of the CDT system and the implementation of SFMP in the demonstration sites. USAID Oceans will conduct an implementation and adoption analysis and standards for tracking fair and legal labor in the fisheries capture component of the supply chain. The analysis will have a key focus on gender issues and involve a gap analysis, risk assessment and interviews with stakeholders and labor partners. As mentioned in the previous activity, USAID Oceans will conduct a value chain analysis that	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	<p>will also identify labor and role of women in selected fisheries, the level of engagement of women in current and planned fisheries management, and stakeholder analysis of women in fisheries. Details of the gender analysis and implementation work are given in Annex 1.</p> <p>Women often have an important role as traders, buyers and financiers in small-scale and artisanal fisheries in the region. USAID Oceans will consult women entrepreneurs to determine what incentives could be offered to encourage their engagement and involvement in SFMP, CDT and FIS in the demonstration sites. In Activity Quarter 4, the DCOP will work with the gender integration specialist and coordinate with the CTI Women Leaders Forum to develop and award grants to groups of women business owners and organizations to support key interventions.</p>	
<p><u>Sub-activity 1.23</u> Establish goals and key performance indexes for fisheries and ecosystem management and establish and finalize a plan for each SFMP</p>	<p>To address gaps identified and support existing opportunities within the IMU, USAID Oceans will develop goals and performance indexes to track the Activity and stakeholders' performance within the agreed-upon SFMP. USAID Oceans will use the FIS as an integral part of our M&E and Quality of Service evaluation process. This will create an integrated feedback mechanism for the SFMP, IUU deterrence and FIS for the regional demonstration sites.</p> <p>The management plan for the SFMP in each demonstration site will be developed using training, working with SEAFDEC as the regional SFMP training hub at each demonstration site, develop an SFMP plan to include goals, operational objectives, indicators and benchmarks (key performance indexes), management actions, enforcement, financing mechanisms, and communications.</p>	
<p>Activity 2. Expand Implementation of the CDT System and SFMP for Areas Important for Biodiversity in the Asia-Pacific Region</p>	<p>Once the CDT minimum product has been deployed and the SFMPs for the demonstration sites are well underway, the COP will lead the design of the expansion strategy to regional sites in consultation with USAID, SEAFDEC and key partners.</p>	<p>1,232,388</p>
<p><u>Sub-activity 2.1</u> Identify areas with high value for biodiversity in a consultative process</p>	<p>USAID Oceans will consult regional partners to identify the priorities for engagement via the FIS, identifying where sustainable fisheries management is ongoing and where the CDT system could add value.</p>	
<p><u>Sub-activity 2.2</u> Collaborate with USAID and donor projects to ensure interoperability and transparency</p>	<p>USAID Oceans will take advantage of opportunities to contribute to the execution of and benefit from lessons learned by other USAID and donor projects in the region.</p>	
<p><u>Sub-activity 2.3</u> Initiate consultation and behavior change communication to foster uptake of the CDT system</p>	<p>USAID Oceans will build robust, polished communication nodes and materials into the FIS to bring a diverse user base and additional opportunities for scaling the system.</p>	
<p><u>Sub-activity 2.4</u> Commence system sustainability analyses at the regional level</p>	<p>USAID Oceans will ensure that the entities responsible for maintaining and financing the FIS and CDT system beyond the life of the activity are in place and that the entities have capacity to do so.</p>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
Sub-activity 2.5 Initiate determination of entity to house the CDT	USAID Oceans will work with regional stakeholders to identify a host for the CDT and FIS and distribute maintenance of different nodes appropriately amongst member countries and the private sector.	
Sub-activity 2.6 Initiate establishment of CDT system management, quality and financial sustainability goals	USAID Oceans will establish a technical working group for coordination within the entities involved in the CDT system and FIS, with financial sustainability ensured by user fees from catch buyers, sellers and countries that are interested in using the system to inform their own fisheries management, as well as funds from enforcement fines.	
Activity 3. Strengthen Capacity of Regional and National Organizations to Conserve Biodiversity using CDT Systems and Complementary SFMP	USAID Oceans will build capacity by embedding staff in and working within the regional institutions in the region. USAID Oceans will focus on SEAFDEC, the CTI-CFF Secretariat, the OCC and other regional organizations to meet those goals. Working with women's organizations, building capacity for small businesses to integrate in the FIS, and PPPs will be the other focal capacity-building efforts under the Activity.	507,979
Sub-activity 3.1 Engage with CTI-CFF, SEAFDEC, and regional fisheries organizations	To improve institutional capacity and ensure the activity works within the cultural and regional context, USAID Oceans will embed members of the USAID Oceans team for extended periods in SEAFDEC and national agencies/partners. The Demonstration Site Managers will be based in the regional offices of government partners.	
Sub-activity 3.2 Conduct CDT/FIS, SFMP, PPP and Gender and Vulnerable Populations training	The USAID Oceans team will conduct targeted trainings for SEAFDEC regional and national technical teams and relevant partners in the area of CDT/FIS, SFMP formulation and implementation, PPP development and gender/vulnerable populations analyses, issue-action planning and implementation.	
Sub-activity 3.3 Engage women's groups	An initial priority of USAID Oceans will be to engage women and vulnerable groups in the region involved in the finance and sale of fisheries products. USAID Oceans will initially engage to solicit feedback and interest in CDT and FIS and SFMPs. Later in the activity life, as the nodes of the system are ready for use in Month 8, USAID Oceans will engage to provide the tools and trainings women might need to use and profit from the FIS through grants to women's or professional associations.	
Activity 4. Engage the public and private sector to enhance sustainability, uptake of CDT/SFMPs and coordination with regional stakeholders		875,147
Sub-activity 4.1 Rapid partnership appraisal	The Senior PPP Advisor will conduct an RPA to identify and scope partnership opportunities across the activity components and priority development screens, with an emphasis initially on developing and implementing the CDT system, and implementing SFMPs at the demonstration sites. The RPA will involve interviews conducted through phone calls, in-person interviews, scoping trips to the demonstration countries and Singapore, and attendance at key international and regional fisheries events. USAID Oceans will also identify additional partnerships through the value chain analysis for the demonstration fisheries/sites. The RPA	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	<p>will focus on both shorter-term partnerships for Year 1 and 2 and medium- and longer-term partnerships for Years 3 through 5.</p> <p>As a core element, the RPA will analyze the interests, challenges, and issues facing the private sector and other value chain actors in the targeted value chains/fisheries related to the activity's objectives. The activity will also engage foundations, donor programs, nongovernmental organizations (NGOs) and financial institutions to explore collaboration and opportunities to leverage additional funding and resources to support the core objectives of establishing a financially sustainable regional CDT system to combat IUU fishing and seafood fraud. Partnership opportunities will be rooted in the needs and interests of both the private sector (fishing industry, exporters, seafood processors, etc.) and public sector stakeholders. An important objective of the RPA methodology is to provide a clear understanding of the ways in which partnerships can best be integrated into the activity's planning process and where partners can provide the greatest additional value in achieving key activity outcomes.</p> <p>In an RPA report, the activity will provide a profile of at least 15 partnership concepts with the potential to leverage significant public and private capital and investment, technology and in-kind resources to support the activity's objectives. The report will also include key next steps for further prioritization and planning and tools to assist the USAID Oceans team in navigating how, when, and what partnerships should be pursued.</p>	
<p><u>Sub-activity 4.2</u> Partnership prioritization</p>	<p>USAID Oceans will prioritize a targeted group of partnerships for Years 1-2 that will bring the highest potential value to the USAID Oceans activity in the development of the CDT and FIS systems and implementation of the demonstrations. The prioritization will be informed by the demonstration site selection and inception workshop, and it will also be completed in coordination with the development of the USAID CDT system architecture, SFMP plans and the VCA for the demonstration sites.</p> <p>USAID Oceans will host an initial prioritization workshop with USAID and SEAFDEC to narrow and select those opportunities that best balance activity resources and needs, private sector interests and readiness for partnering, with projected outcomes and impacts. The output will be an initial list of partnerships identified for Years 1-2 for further validation and planning before launching. The activity will also hold partnership prioritization workshops at the demonstration sites following the value chain analysis.</p>	
<p><u>Sub-activity 4.3</u> Partnership validation and planning</p>	<p>Once initial partnerships are prioritized, the USAID Oceans activity will convene a partnership planning workshop in Bangkok, Thailand with CDT developers and technology companies in conjunction with the Technology Innovation Forum planned for February</p>	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	2016, and partnerships planning workshops for the demonstration sites in March-May 2016. The planning workshops will bring together potential private sector and public stakeholder partners including SEAFDEC, governments (national and local), processors, fisher groups, technology companies and others in order to validate partnership concepts and plan activities. The activity will use advanced participation methods to develop a consensus-based action planning approach to each partnership development and implementation.	
<u>Sub-activity 4.4</u> Develop and conduct an engagement plan for private sector and other potential partners	The Senior PPP Advisor will develop a private sector engagement and partnership plan that covers key industry events, meetings, timelines, and opportunities for engagement. USAID Oceans will present at national, regional and international fisheries and seafood industry conferences and conduct direct outreach to raise awareness on activities among key private sector stakeholders. The activity will partner with private sector organizations and NGOs in the region and key markets to raise awareness, buy in, and participation in the activity from a broader group of private sector and other nongovernmental stakeholders to implement a regional CDT, combat IUU fishing, and promote SFMPs in the region.	
<u>Sub-activity 4.5</u> Strengthen the capacity of industry associations and fisher organizations to deliver guidance and input on the development and implementation of the CDT and SFMP	USAID Oceans will build the capacity of key industry associations, fisher organizations and other nongovernment organizations engaged in the demonstration sites to deliver more cohesive and effective guidance and technical input on development and implementation of CDT and SFMP plans. These capacity-building interventions will help these associations and fisher organizations to support their member companies and/or fishers to implement and track performance on implementation of the SFMP plan and deployment of the CDT. USAID Oceans will explore capacity building grants and interventions with national and regional private sector associations that will lay the foundation to expand the CDT system implementation to other countries and fisheries.	
<u>Sub-activity 4.6</u> Engage regional private sector and partnership platforms in support of activity goals	In Years 1-2, USAID Oceans will identify and engage regional private sector partnership platforms that can build private sector interest and leverage in support of key activity outcomes. USAID Oceans will work with SEAFDEC and CTI-CFF to engage the ASEAN Public-Private Taskforce for Sustainable Fisheries and Aquaculture, the FIP for ASEAN Steering Committee and other regional public-private sector dialogue platforms and private sector associations to expand the implementation of the CDT and SFMPs beyond the demonstration sites.	
<u>Sub-activity 4.7</u> Advance regional fisheries governance through coordination of the Oceans Consultative Committee	USAID Oceans will convene USG agencies and the OCC to review and refine the situation models and results chains including key assumptions made in defining causal links and expected results. Using this analysis, the Partnership will refine and align planned activities, roles and responsibilities, and timelines and milestones to achieve the greatest likelihood of success.	

Proposed Activity	Description of Proposed Activity	Proposed Budget
	Once the OCC inception workshop takes place with SEAFDEC a document will be developed which states the name of key partners, briefly defines the benefit expected from the USAID Oceans partnership and the expected role the partner will play in the implementation of the USAID Oceans project.	
<u>Sub-activity 4.8</u> Improve capacity of regional organizations to partner effectively	USAID Oceans will organize and facilitate regional meetings and regular conference calls to maintain open and productive communication channels among all partners, documenting discussions and action items and fulfilling partner requests for information and other needs.	

*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.

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1. Implement a financially sustainable catch documentation and traceability system with complementary SFMPs in regional demonstrations	
<u>Sub-activity 1.1</u> Conduct a requirements matrix for an integrated approach to catch documentation, traceability, and fisheries information systems architecture	CD, traceability, FIS requirements matrix completed
<u>Sub-activity 1.2</u> Conduct an adoption analysis of CDT systems	CDT systems adoption analysis completed
<u>Sub-activity 1.3</u> Conduct an adoption analysis of fisheries information systems architecture	FIS architecture adoption analysis completed
<u>Sub-activity 1.4</u> Conduct an adoption analysis of safety and beneficiary communications requirements and their impact on CDT technologies and services	Safety and beneficiary communications requirements adoption analysis completed
<u>Sub-activity 1.5</u> Conduct an adoption analysis of electronic monitoring, electronic reporting, and remote sensing components to support planned CDT, FIS, and MCS components	E-monitoring, e-reporting and remote sensing adoption analysis completed
<u>Sub-activity 1.6</u> Conduct an adoption analysis of CDT technologies and standards for tracking of fair and legal labor in the fisheries capture component of the supply chain	Technologies and standards for fair labor adoption analysis completed
<u>Sub-activity 1.7</u> Conduct an adoption analysis of information and communications technologies	Information and communications technologies adoption analysis completed
<u>Sub-activity 1.8</u> Draft RFP and award sub-contract of the CDT MVP	CDT MVP sub-contract awarded

Proposed Activity	Expected Outcomes/Outputs of Activity
<u>Sub-activity 1.9</u> Conduct a CDT technology review and innovation forum	CDT technology review and innovation forum completed
<u>Sub-activity 1.10</u> CDT data exchange proof of concept	Data exchange proof of concept completed
<u>Sub-activity 1.11</u> Conduct a value chain analysis to determine the business case for different information on catch	Value chain analysis completed
<u>Sub-activity 1.12</u> Conduct a feasibility/cost-benefit analysis of the technologies available for different users and audiences	Technology feasibility/cost-benefit analysis completed
<u>Sub-activity 1.13</u> Contract partners to implement selected technologies	Technology implementation partners contracted
<u>Sub-activity 1.14</u> Integrate CDT with components of FIS with SFMP and stakeholders for feedback and adaptation loop	CDT, FIS and SFMP integration complete
<u>Sub-activity 1.15</u> Implement the catch documentation system in an EAFM framework using fishery improvement projects for demonstration	Demonstration fisheries chosen, CDT and EAFM systems implemented
<u>Sub-activity 1.16</u> Strengthen sustainable fisheries management in the Sulu-Celebes Sea, focusing on two demonstration fisheries	Sustainable fisheries management at demonstration fisheries strengthened
<u>Sub-activity 1.17</u> Meet with USAID and OCC to confirm regions and fisheries for demonstrations	Agree on demonstration fisheries
<u>Sub-activity 1.18</u> Strengthen and implement SFMP in a consultative process with stakeholders	Stakeholder consultations on demo sites conducted
<u>Sub-activity 1.19</u> Strengthen and implement SFMP in a consultative process with regional stakeholders	Stakeholder consultations on regional level conducted
<u>Sub-activity 1.20</u> Identify and prioritize gaps in policy, information, management and coordination	Key SFMP gaps identified
<u>Sub-activity 1.21</u> Conduct a value chain analysis for the fisheries in the demo sites and link the SFMP to the CDT system	Value chain analysis completed
<u>Sub-activity 1.22</u> Co-develop goals and benchmarks for gender and labor transparency and equality, and a plan to reach them	Human welfare goals and plans established
<u>Sub-activity 1.23</u> Establish goals and key performance indexes for fisheries and ecosystem management and establish and finalize a plan for each SFMP	Fisheries ecosystem management goals and plans established
Activity 2. Expand implementation of the CDT system and SFMP to areas important for biodiversity in the Asia-Pacific Region	
<u>Sub-activity 2.1</u> Identify areas with high value for biodiversity in a	CDT system expansion areas identified

Proposed Activity	Expected Outcomes/Outputs of Activity
consultative process	
<u>Sub-activity 2.2</u> Collaborate with USAID and donor projects to ensure interoperability and transparency	Coordination with USAID and donor projected completed
<u>Sub-activity 2.3</u> Initiate consultation and behavior change communication to foster uptake of the CDT system	Communications materials developed
<u>Sub-activity 2.4</u> Commence system sustainability analyses at the regional level	Sustainability analyses initiated
<u>Sub-activity 2.5</u> Initiate determination of entity to house the CDT	CDT and FIS host identified
<u>Sub-activity 2.6</u> Initiate establishment of CDT system management, quality and financial sustainability goals	Technical working group for CDT system coordination established
Activity 3. Strengthen capacity of regional and national organizations to conserve biodiversity using CDT systems and complementary SFMP	
<u>Sub-activity 3.1</u> Engage with CTI-CFF, SEAFDEC, and regional fisheries organizations	Regional fisheries organization coordination mechanisms established and implemented
<u>Sub-activity 3.2</u> Conduct CDTFIS, SFMP, PPP and Gender and Vulnerable Populations training	Capacity development needs identified, Targeted trainings held
<u>Sub-activity 3.3</u> Engage women's groups	Scoping studies undertaken to identify opportunities to empower women and vulnerable groups, Women and vulnerable groups engaged
Activity 4. Engage the public and private sector to enhance fisheries sustainability, CDT/SFMP uptake and coordination with regional stakeholders	
<u>Sub-activity 4.1</u> Rapid partnership appraisal	Rapid partnership appraisal conducted, report finalized
<u>Sub-activity 4.2</u> Partnership prioritization	Priority partnerships identified
<u>Sub-activity 4.3</u> Partnership validation and planning	Partnership planning workshop held
<u>Sub-activity 4.4</u> Develop and conduct an engagement plan for private sector and other potential partners	Engagement plan developed
<u>Sub-activity 4.5</u> Strengthen the capacity of industry associations and fisher organizations to deliver guidance and input on the development and implementation of the CDT and SFMP	Capacity-building grants awarded
<u>Sub-activity 4.6</u> Engage regional private sector and partnership platforms in support of activity goals	Public-private sector dialogue platforms engaged
<u>Sub-activity 4.7</u> Advance regional fisheries governance through coordination of the Oceans Consultative Committee	Oceans Consultative Committee established and convened
<u>Sub-activity 4.8</u> Improve capacity of regional organizations to partner effectively	Oceans Consultative Committee coordination meeting schedule set, Meetings supported

3. Schedule of Activity for the Year 2016

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity1. Implement a financially sustainable catch documentation and traceability system in regional demonstrations	x	x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 1.1</u> Conduct a requirements matrix for an integrated approach to catch documentation, traceability, and fisheries information systems architecture	x											
<u>Sub-activity 1.2</u> Conduct an adoption analysis of CDT systems	x	x	x	x	x	x	x					
<u>Sub-activity 1.3</u> Conduct an adoption analysis of fisheries information systems architecture	x	x	x	x	x	x						
<u>Sub-activity 1.4</u> Conduct an adoption analysis of safety and beneficiary communications requirements and their impact on CDT technologies and services	x	x	x									
<u>Sub-activity 1.5</u> Conduct an adoption analysis of electronic monitoring, electronic reporting, and remote sensing components to support planned CDT, FIS, and MCS components			x	x	x	x						
<u>Sub-activity 1.6</u> Conduct an adoption analysis of CDT technologies and standards for tracking of fair and legal labor in the fisheries capture component of the supply chain	x	x	x	x	x	x						
<u>Sub-activity 1.7</u> Conduct an adoption analysis of information and communications technologies	x	x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 1.8</u> Draft RFP and award sub-contract of the CDT MVP	x	x	x	x	x	x						
<u>Sub-activity 1.9</u> Conduct a CDT technology review and innovation forum	x	x	x	x								
<u>Sub-activity 1.10</u> CDT data exchange proof of concept		x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 1.11</u> Conduct a value chain analysis to determine the business case for different information on catch	x	x	x									

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<u>Sub-activity 1.12</u> Conduct a feasibility/cost-benefit analysis of the technologies available for different users and audiences	x	x	x	x								
<u>Sub-activity 1.13</u> Contract partners to implement selected technologies	x	x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 1.14</u> Integrate CDT with components of FIS with SFMP and stakeholders for feedback and adaptation loop	x	x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 1.15</u> implement the catch documentation system in an EAFM framework using fishery improvement projects for demonstration	x	x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 1.16</u> strengthen sustainable fisheries management in the Sulu-Celebes Sea, focusing on two demonstration fisheries	x											
<u>Sub-activity 1.17</u> Meet with USAID and OCC to confirm regions and fisheries for demonstrations	x											
<u>Sub-activity 1.18</u> Strengthen and implement SFMP in a consultative process with stakeholders	x											
<u>Sub-activity 1.19</u> Strengthen and implement SFMP in a consultative process with regional stakeholders												
<u>Sub-activity 1.20</u> Identify and prioritize gaps in policy, information, management and coordination	x											
<u>Sub-activity 1.21</u> Conduct a value chain analysis for the fisheries in the demo sites and link the SFMP to the CDT system	x											
<u>Sub-activity 1.22</u> Co-develop goals and benchmarks for gender and labor transparency and equality, and a plan to reach them	x	x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 1.23</u> Establish goals and key performance indexes for fisheries and ecosystem management and establish and finalize a plan for each SFMP			x	x	x	x	x	x	x	x	x	x

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity 2. Expand implementation of the CDT system and SFMP in areas important for biodiversity in the Asia-Pacific region												
<u>Sub-activity 2.1</u> Identify areas with high value for biodiversity in a consultative process							X	X	X	X	X	X
<u>Sub-activity 2.2</u> Collaborate with USAID and donor projects to ensure interoperability and transparency							X	X	X	X	X	X
<u>Sub-activity 2.3</u> Initiate consultation and behavior change communication to foster uptake of the CDT system							X	X	X	X	X	X
<u>Sub-activity 2.4</u> Commence system sustainability analyses at the regional level	X	X	X	X	X	X	X	X	X	X	X	X
<u>Sub-activity 2.5</u> Initiate determination of entity to house the CDT			X	X	X	X	X	X	X	X	X	X
<u>Sub-activity 2.6</u> Initiate establishment of CDT system management, quality and financial sustainability goals	X	X	X	X	X	X	X	X	X	X	X	X
Activity 3. Strengthen capacity of regional and national organizations to conserve biodiversity using CDT systems and complementary SFMP												
<u>Sub-activity 3.1</u> Engage with CTI-CFF, SEAFDEC, and regional fisheries organizations	X	X	X	X	X	X	X	X	X	X	X	X
<u>Sub-activity 3.2</u> Conduct CDTFIS, SFMP, PPP and Gender and Vulnerable Populations training	X	X							X			
<u>Sub-activity 3.3</u> Engage women's groups	X	X	X	X	X	X	X	X	X	X	X	X
Activity 4. Engage the public and private sector to enhance fisheries sustainability, CDT/SFMP uptake and coordination with regional stakeholders												
<u>Sub-activity 4.1</u> Rapid partnership appraisal	X	X										
<u>Sub-activity 4.2</u> Partnership prioritization	X	X										
<u>Sub-activity 4.3</u> Partnership validation and planning	X	X	X	X								

Proposed Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<u>Sub-activity 4.4</u> Develop and conduct an engagement plan for private sector and other potential partners	x	x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 4.5</u> Strengthen the capacity of industry associations and fisher organizations to deliver guidance and input on the development and implementation of the CDT and SFMP	x	x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 4.6</u> Engage regional private sector and partnership platforms in support of activity goals	x	x	x	x	x	x	x	x	x	x	x	x
<u>Sub-activity 4.7</u> Advance regional fisheries governance through coordination of the Oceans Consultative Committee	x			x				x			x	
<u>Sub-activity 4.8</u> Improve capacity of regional organizations to partner effectively			x	x								

Annex 6

SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES FOR THE YEAR 2015-2016**I. Aquaculture Department (Appendix 1)**

Project Title	2015	2016	Appendix No.
1. Quality Seed for Sustainable Aquaculture	Y	Y	2
2. Healthy and Wholesome Aquaculture	Y	Y	3
3. Maintaining Environmental Integrity through Responsible Aquaculture	Y	Y	4
4. Adapting to Climate Change Impacts	Y	Y	5
5. Meeting Socio-economic Challenges in Aquaculture	Y	Y	6

II. Training Department (Appendix 7)

Project Title	2015	2016	Appendix No.
6. Promotion on Strengthening of SEAFDEC Visibility and Image	Y	Y	8
7. Tailor-made Training Programs	Y	Y	9
8. Improvement of Fisheries Technology and Reduction of the Impact from Fishing	Y	Y	10

Y = Program implemented during the year

N = Program not implemented during the year

AQUACULTURE DEPARTMENT

OVERALL REVIEW

SEAFDEC/AQD has continued to demonstrate its strong commitment to sustainable aquaculture development and responsible stewardship of aquaculture resources by implementing Programs/Projects that are in line with the priorities of the recommendations during the 2011 ASEAN-SEAFDEC Conference on Sustainable Fisheries and the framework of the Resolution and Plan of Action for sustainable aquaculture in the next decade.

For 2015, AQD has implemented 66 studies under five thematic Programs which focus on: (i) Quality Seed for Sustainable Aquaculture; (ii) Healthy and Wholesome Aquaculture; (iii) Maintaining Environmental Integrity through Responsible Aquaculture; (iv) Adapting to Climate Change Impacts; and (v) Meeting Social and Economic Challenges in Aquaculture. Activities in these Programs involve research, verification and demonstration of aquaculture technologies in the priority areas of broodstock development and seed production, farming systems and ecology, nutrition and feed development, fish health management, and socio-economics. In addition, training and information dissemination activities were likewise conducted.

The highlights of activities and accomplishments in 2015 (January to September) under various Departmental Programs are presented below:

1. Quality seed for sustainable aquaculture

This Program focuses on studies and activities that determine the optimal conditions and methods for the production of quality seed stock in sufficient quantities. The research activities entail the use of methods of stock improvement such as domestication, broodstock management, strain evaluation and selective breeding or genetic improvement of traditional and emerging freshwater and marine species.

- *Development of good quality broodstock and implementation of proper stock management protocols*

Good quality spawners/ breeders are important for producing seeds for foodfish production or for stock release and aquatic species conservation. It is recommended that such stocks should be genetically diverse to produce fit larvae that survive and grow well when farmed/released in specific environments.

Molecular markers that will identify stocks and consequently aid in determining genetic quality are currently being developed for several commercial aquaculture species. With financial support from the Philippine Department of Science and Technology (DOST), collaborative studies are being conducted with the University of the Philippines and Tohoku University, Japan, for the identification of molecular markers that will aid in the proper management of broodstock for milkfish, shrimp, crabs, abalone and oyster.

The genetic variation of milkfish samples from three wild populations, eleven local hatchery stocks, and a hatchery stock from West Java in Indonesia were examined. An Indonesian stock was included since in the Philippines, Indonesian milkfish fingerlings are imported and farmed for having purportedly better production traits. Results showed significant but low genetic differentiation among the milkfish populations for much of the variation is attributed to intra-population differences (98.6%). The Indonesian stock had genetic variability levels comparable with local stocks. Results of these genetic analyses need to be considered in the context of promoting effective milkfish broodstock management practices for the production of good quality seed stock. As for the abalone, aside from the current SEAFDEC hatchery stock, wild stocks from various provinces in the Philippines were collected and families per stock are being produced for genetic diversity and production characteristic assessments. To date, the hatchery stock has the highest and the Pangasinan stock has the lowest fecundity. Molecular characterization of potential oyster broodstock from wild sources is also currently

being done in collaboration with the University of the Philippines, Visayas as part of the DOST-funded National Oyster R&D Program.

Apart from genetic intervention, nutritional approaches to improve reproductive performance in farmed aquatic commodities were explored. The sustainable production of marine annelid (*Marphysa mossambica*) is being pursued as this serves as potential feed for crab and shrimp broodstock. Results showed that increasing the level of polychaete meal in formulated feeds in combination with natural food (mussel, fish, and squid at daily ration) without live polychaetes correspondingly increased mud crab zoeal production.

In the oyster, *Crassostrea irredalei*, protocols for broodstock management and conditioning are being developed to maximize production. Faster gonadal development was observed in oysters stocked and reared to maturity in the estuary and in semi-intensively managed ponds than oysters kept in tanks.

With regard to silver therapon (*Leiopotherapon plumbeus*), an example of emerging species for aquaculture, experiments are being done to compare the growth and reproductive performance as well as the nutritional profile of wild and hatchery-reared stocks. Silver therapon which comprised the wild stock were collected from a fish trap in the lake near the research station while the hatchery stock were maintained in cages suspended in outdoor tanks at AQD's Binangonan Freshwater Station. Preliminary data showed that mean gonado-somatic and gut indices were higher for hatchery-bred stocks than the wild stocks.

With funding from Australian Centre for International Agricultural Research (ACIAR), activities are also being undertaken to study the giant grouper for broodstock development and genetic stock management, with the end goal of developing protocols for consistent and sustainable production of giant grouper seed stocks. ACIAR is supporting this collaborative research between the University of Sunshine Coast (Australia), Research Institute for Aquaculture No. 1 (Viet Nam) and SEAFDEC/AQD.

As for the seahorse *Hippocampus* sp., tissue samples were collected from the study site (Molocaboc Is., Sagay City, Negros Occidental) and the SEAFDEC/AQD seahorse hatchery, and seahorse hatchery in Japan for genetic characterization. Microsatellite marker analysis showed very low degree of differentiation among populations of wild and hatchery produced seahorses.

Apart from environmental manipulation, nutritional approaches are being applied to improve the reproductive performance in the sandfish, *Holothuria scabra* broodstock. Survival of the broodstock fed shrimp feed and *Sargassum* powder was 100% when reared for the entire 8-week experimental run. The *Navicula*-fed group had 100% survival until the 7th week but only 80% survived until the end of the 8th week. When warm shock vs. cold shock was used in artificial spawning, the percentage of broodstock that spawned was higher (7%) for those exposed to warm shock compared to those under the cold shock treatment (2%).

The production of blue swimming crab, *Portunus portunus* at present is totally reliant on wild stocks. Hence, further improvement in the captive breeding and seed production techniques of this species is necessary. A study tried to determine the effective transport techniques for potential spawners from the wild to the farm. Results of trials indicated that it is feasible to transport crabs at a high loading density (10 pcs/8-liter water capacity plastic bag) for a 6-hour travel period.

Refinement of hatchery and nursery management methods to improve seedstock quality and production

In the abalone, hatchery production has been improved with the use of a microparticulate diet (MPD) as alternative feed. An agar-bound microparticulate diet has been formulated (47.2% CP and lipid at 8.9%) based on the nutrient profile of post larval abalone. Mean survival (38.6-43.3%) was highest for larvae from both hatchery-bred and wild broodstocks fed a combination of natural food and MPD, regardless of feeding duration.

In an effort to increase abalone juvenile production through the improvement of hatchery culture techniques, the efficiency of using chemical cues (positive ions, algal extracts) to improve settlement

rate was evaluated. Settlement inducer (dopamine hydrochloride at 10^{-6} M) resulted to higher settlement rate. As for the algal extract, the algae *Nitzschia* sp. was noted to consistently induce high abalone settlement and survival rate. The use of anaesthetic agents such as muscle relaxant was found to enhance efficiency in sorting and harvesting of abalone juveniles.

In the oyster, the combined spawning methods of dessication with flow-through UV-irradiated water were used in the production of high quality oyster seedstock. Results of another experiment showed that empty oyster shells, marble stones and polyethylene strips were the most suitable substrates for settlement. To improve spat production, treatment with epinephrine bitartrate was tried apart from the use of down-welling vs. upwelling settlement units. Methods of remote setting of oysters were also tried and results showed that survival of pediveligers transported with water was higher than those transported without water.

Efforts have been made to further improve the mudcrab hatchery schemes. The use of various types of formulated diets (containing 2% squid meal, 2% annelid meal, or 1% annelid meal) and a control diet composed mainly of natural food and their combinations was compared based on % survival and population development index (PDI) of crab larvae.

For the blue swimming crab (BSC), studies aimed at reducing the use of natural food that requires more labor and facilities were undertaken. Another experiment involved a stress test using formalin at varying concentrations and exposure duration to determine larval quality. Results indicated that a formalin stress test may be used to determine the quality of the newly hatched BSC zoeae for seed production. In terms of the use of antibiotics during larval rearing, it was noted that BSC megalopae can still be produced without antibiotics if larval quality is good. As regards nursery rearing of the BSC, experiments were conducted to test the salinity requirement of later crab instar stages and to determine the most suitable feeding regime. To further refine the methods for nursery rearing of BSC, trials to identify the most suitable substrate and shelter were also done.

Feeding experiments in the silver therapon (*L. plumbeus*), revealed that *Brachionus rotundiformis* was a suitable food for first feeding larvae. Feeding protocol has also been established which involves feeding with *B. rotundiformis* from 2 to 13 days after hatching (DAH), *Artemia* nauplii from 14 to 35 DAH, and co-feeding of *Artemia* nauplii and artificial diet from 36 to 95 DAH. A microparticulate diet was also tried on the larvae and it showed that weaning time did not have a significant effect on final length and body weight of the larvae.

Improvements in the hatchery and nursery production of sandfish *Holothuria scabra* have been undertaken. It was noted that *Chaetoceros*-fed larvae had better survival, faster development and lower incidence of deformities. Larval development is better in the group fed microalgae at 20,000 cells/ml.

To enable the promotion of *Kappaphycus* farming, nursery rearing techniques are being refined. The protocol in the land and sea-based nurseries is continuously being optimized to shorten the nursery culture period. Meanwhile, tissue cultured explants were successfully outplanted in Bohol, Zamboanga, and Guimaras. The propagules grew up to the 4th pruning stage only.

- *Development of schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks*

To address this objective on commercial species, selective breeding programs have continued for milkfish, mudcrab, shrimp and abalone. For mudcrab, selective breeding is geared towards development of a disease resistant stock and a fast growing strain. For the milkfish, with the outcome of the molecular marker studies, plans for comparing growth in stocks known to potentially have high genetic variability and/or fitness shall be evaluated through field trials in ponds and cages.

Hybridization is being continuously implemented using the local commercial abalone species (*Haliotis asinina*). *H. asinina* has been crossed with other Philippine abalone species, *H. planata* and *H. glabra*, to enable the production of stocks/species with improved traits. The stocks are being grown to become potential broodstock. All of the hybrids are being maintained. Some samples of the hybrid stocks were sent to Hokkaido University for genetic characterization.

In seaweeds, to address the problem of ice-ice disease, methods to develop resistant strains of the seaweed *Kappaphycus* and reduce susceptibility to epiphytes are being studied. Fertilized *Kappaphycus* have been found to be less susceptible to ice-ice. Diploid *Kappaphycus* have higher specific growth rate than haploids and the carrageenan quality from both diploids and haploids are not different. Viscosity of carrageenan from diploid plants is significantly higher than the viscosity of carrageenan from haploid plants. Finally, the carrageenan quality of *Kappaphycus* produced from spores is not different from the quality of carrageenan from either haploid or haploid plants.

- *Adoption of economically viable systems to produce sufficient seedstock*

Several fish/shellfish production projects are being implemented at SEAFDEC/AQD to demonstrate the viability of small-scale and/or large-scale seed production systems. Mass production of sex-reversed and mixed-sex Nile/red tilapia fingerlings as well as large scale production of abalone juveniles, are continuously being done. The experiments on reverse day-night cycle and the use of *Nitzschia* sp as food were also conducted to further improve abalone juvenile production.

2. Healthy and wholesome aquaculture

The goal of the Program is to improve aquaculture production through innovations in nutrition and feeding and fish health management, and in preserving the environmental integrity of aquaculture areas.

- *Investigation on the efficacy of indigenous probiotics*

An indigenous poly- β -hydroxybutyrate (PHB)-accumulating mixed bacterial culture and two PHB-accumulating *Bacillus* spp. were isolated from a Philippine shrimp culture pond and investigated for their capacity to improve growth, survival and robustness of *Penaeus monodon* postlarvae. Current data demonstrated that indigenous bacilli capable of accumulating PHB can provide beneficial effects to *P. monodon* post-larvae during culture in conjunction with growth performance, survival and resistance against pathogenic infection and ammonia stress.

Another indigenous probiont (*Bacillus subtilis*) possessing antimicrobial and quorum-sensing activity against *V. harveyi*, a known pathogen in mudcrab hatcheries, was also isolated from the rearing environment, body surface, and gastro-intestinal tract of mudcrab. Simulated hatchery runs showed that oral administration of *B. subtilis* could confer protection in mudcrab as evidenced by the successful production of crab instar with a survival rate of 1%, which is better than the commercial probiotic control with 0% survival. Confirmatory trials are ongoing.

- *Application of diagnostics that will ensure biosecurity within culture systems*

Since site selection and effective zoning hold the keys to sustainable production of high quality aquaculture products, research was initiated to establish the sanitary quality of oysters (*Crassostrea iredalei*). Two major oyster-producing areas located in Cabugao bay and Agojo River (province of Capiz in Western Visayas, Philippines) were investigated for their sanitary quality. The microbial quality of major oyster culture areas in Visayas (Roxas) was established. Moreover, oyster sites have been identified and were chosen as potential stations for relaying experiment. Oysters that will be used for the relaying and depuration experiments will be collected from the aforementioned oyster production areas. In another study, the bacterial microbiota of tilapia (*Oreochromis niloticus*) cultured in earthen ponds was analyzed quantitatively and qualitatively. The composition of bacterial microbiota in the culture environment and also the threshold level to bacterial load in water, sediment, gills and intestines of healthy tilapia reared in earthen ponds were established. The findings from this study are expected to provide baseline information for the establishment of Tilapia GAqP (good aquaculture practices for tilapia).

- *Promotion on the wider use of conventional diagnostic as well as new methods for newly reported, emerging diseases*

Diseases affecting farmed and wild mud crab including predisposing, risk and protective factors, and possible prevention and control measures of the diseases were studied. Identified risk factors for

WSSV include low temperature and presence of WSSV positive shrimp. A total of 1450 bacterial isolates were also recovered from the hemolymph of mud crabs. Pathogenicity tests suggested that opportunistic bacteria could only induce mortality when mudcrabs are stressed such as when they are newly molted.

There is lack of a comprehensive online information resource on shrimp pathogens with a centralized facility to store and archive isolates collected from outbreaks all over the Philippines. To fill this need, a database of aquatic pathogens occurring in the country was instituted. A total of 1321 bacterial isolates were collected and bio-banked. Samples came from shrimp farms located in 79 countrywide sites in Luzon, Visayas, and Mindanao. Of these, 27 sites were found to be disease-positive (WSSV, luminous vibriosis, IHNV, MBV, and AHPND). To obtain meaningful information from the data generated, a database software intended for web-based accessibility by users was developed. The biological data are accompanied by epidemiological information collected on site during sample collection. A Biobank Room dedicated for storing and archiving isolates that is compliant to at least level 2 biosafety and biosecurity standards has been established in SEAFDEC/ AQD. Refinements are also being undertaken to improve the detection limit of a lateral-flow strip biosensor (LFSB) kit, *i.e.* to be at par with the nested-step of the optimized WSSV PCR method.

- *Finding effective alternative safe drugs/chemicals to manage aquaculture diseases in lieu of harmful chemicals and drugs*

Infectious diseases of bacterial etiology are some of the constraints limiting mudcrab hatchery production. Lack of alternatives to antibiotics (whose use has been banned or discouraged due to food safety concerns) has hampered the production of adequate seeds to spur production in grow-out facilities. Two plants extracts (*Terminalia catappa* local name: Talisay and *Nephelium lappaceum* local name: Rambutan) were tested to have antimicrobial activity *in vitro* (agar disc diffusion method) and *in vivo* (oral administration followed by bacterial challenge). Simulated hatchery runs showed that oral administration of Talisay successfully produced crab instar with a survival rate of 1.2% and 1.8% in trials 1 and 2 comparable to antibiotic control.

- *Finding different sources of fish meal substitutes and development of effective feed management schemes that incorporate sound management*

If farming systems are to be sustainable in the long term, it is essential that alternative protein sources that could be used as fish meal substitutes be identified for use in the formulation of aquaculture feed for various species. Experiments revealed that fermented cowpea could replace 40% of fishmeal in milkfish feed. In another study on milkfish, the 50% fish meal replacement with defatted soybean meal and 40% for soy protein concentrate have been tried both in marine cages in Igang, Guimaras Province and brackish water pond in Dumangas, Iloilo. Results showed that the use of this SEAFDEC-USB diet gave a lower FCR (cages-1.6; ponds-1.8) compared to milkfish commercial feed (cages-2.3; ponds-2.6). The SEAFDEC-USB-fed stocks also attained a marketable size of >400 average body weight in less time. Distillers dried grain solubles (DDGS) could replace 45% of soybean meal in milkfish diet. This is being verified in milkfish culture in marine cages in Igang. Moreover, 10-15% inclusion of milkfish hydrolysate in grouper feed has been tested in a small scale experiment. In abalone, studies have shown that the fertilized *Ulva pertusa* can be considered as fish meal substitutes for juvenile feed, but not *Sargassum* sp.

- *Development of aquafeeds for selected species at specific growth stages especially for species or stages for which no artificial feed has been formulated*

The problem of a very limited number of commercial feeds that have been developed for specific species at different growth stages is being addressed through various studies. In pompano, the study found that taurine requirement for juveniles was around 1.5% at 46% protein. A cost-effective feed will be made available to fish farmers as soon as this finding is confirmed. In another study, the refinement of abalone diet formulation for the grow-out culture resulted in a water stable and highly digestible feed that significantly improved growth rate and shortened the culture period. The meat quality of the abalone fed the refined formulated feed, as determined through Hedonic scale taste testing, was

comparable in terms of color, odor, taste, texture and general acceptability with those abalones fed seaweeds.

- *Promotion of better understanding of the concept of feed conversion ratio, and adequate nutrition and efficient feeding practices among fish farmers to promote fish health*

AQD has continued developing effective feeding management strategies through various studies. In freshwater prawn, high yield can be obtained with high substrate area equivalent to 120% of cage bottom and with a stocking density of 5 prawns/m². In another study on milkfish, the use of a feed where fish meal was partially replaced with soybean-based ingredients in grow-out culture both in marine cages and brackish water ponds gave an FCR of 2.1 compared to 3.4 FCR for commercial feed. For mud crabs, the spherical and tubular shape feeds facilitated feeding and resulted in higher feed consumption by the crabs. It was also found that marine-based attractants such as *Aschetes sp.*, squid meal, shrimp paste and spoiled fish flesh could elicit positive response from mud crab; hence, could be considered as attractants for mud crab feeds. In another experiment, mud crab crablets produced in the nursery can be used for subsequent production of 60-80g juveniles attaining high survival with stocking density of 0.5 individuals/m². Strategies to reduce cannibalism in mud crab nursery include the use of shelters. Frame ribbon nets were found to be the most suitable for the nursery with 60-70% survival at density of 50 individuals/m². For the white shrimp, *Penaeus indicus*, it was found that a stocking density of 10/m² for 60-day grow-out culture period was economical.

To address the issue on lack of awareness on efficient and healthy feeding practices among small-scale fish farmers, demonstration of semi-intensive grow-out culture of grouper using feeds formulated by SEAFDEC/AQD has been done in brackish water pond. Fish fed the SEAFDEC/AQD phase diet showed higher growth and survival rates and lower feed conversion ratio (FCR) compared to fish fed a commercial diet.

On the other hand, the seaweed, *Gracilaria heteroclada* is best cultured using the more preferred broadcast method which is less labor intensive. Nitrogen from 300 ppm NH₄Cl (26-0-0) was found to be effectively absorbed by the seaweed and this fertilization scheme results in good growth.

3. Maintaining environmental integrity through responsible aquaculture

The program aims to develop environment friendly-based aquaculture technologies by integrating environmental factors in SEAFDEC/AQD research activities and promoting responsible aquaculture.

- *Identification of appropriate extractive species that may be used in Integrated Multi-trophic Aquaculture*

The integrated multi-trophic aquaculture (IMTA) using a combination of milkfish, sandfish and seaweeds is currently being conducted. This study, funded by JIRCAS aims to quantify the extent of eutrophication caused by aquaculture. This IMTA experiment uses pens stocked with milkfish, sandfish and seaweeds. A separate monitoring of a milkfish mariculture site was also started in April to determine various environmental (e.g. temperature, tidal current, in situ chlorophyll fluorescence, dissolved oxygen) parameters. The data, once completed, will be used for creating a numerical model of the nutrient flow within a milkfish mariculture system.

- *Development and promotion of efficient and suitable environment-friendly culture systems*

A number of studies under this objective are underway for the following commodities: sandfish *Holothuria scabra*, abalone *Haliotis asinina*, slipper oyster *Crassostrea iridalei*, giant freshwater prawn *Macrobrachium rosenbergii*, and seaweed *Caulerpa lentillifera*.

Concerning the ACIAR-funded pond culture trials and sea-ranching of sandfish *H. scabra*, the project has produced 9470 juveniles of the species. Two experimental nursery sites (protected cove in Barangay Pandaraonan, off the main Igang Marine Station and an open bay in Polopina Island, Concepcion, Iloilo) have been established. Four prospective sandfish sea-ranch sites have also been assessed and the best site was found in Sitio Looc, Polopina Island. Zoning and delineation of the sea

ranching sites have been completed. A formal agreement with local government unit and fisherfolk organization and the local community had been signed and protocol of sea ranch establishment was followed.

The hatchery of the Northern Iloilo Polytechnic State College (NIPSC) was refurbished and set-up for production trials of sandfish. For this purpose, a formal agreement between SEAFDEC/AQD and NIPSC was signed. To engage the local community into active participation in the project, social resource mapping activities were conducted to understand their way of life and determine the local knowledge of their resources and its distribution.

In the case of abalone, *Haliotis asinina*, the stocking density experiments in nursery systems in reef flats and in tanks showed that the mean shell length and body weight were inversely proportional to stocking density. The optimum stocking density recommended for nursery culture trials in both sites is 400 individuals/m². Grow-out experiments in reef flats also showed inverse relationship between stocking density and production parameters based on preliminary results after 150 days of culture.

The DOST-funded research on slipper oyster aims to increase production through refinement of grow-out culture technologies. Based on studies conducted in 2014, pouch was the best culture method; hence, this was used for the second experiment aimed at assessing the best site for oyster culture. In July 2015, experiments using the pouch culture method were done simultaneously in Batan Bay, New Washington, Aklan and in Dumangas, Iloilo.

The grow-out culture of the giant freshwater prawn in an alternative system using biofloc system was recently started. This on-going experiment in indoor tanks uses three carbon sources: molasses, brown sugar and potato starch.

The optimization of culture of the seaweed *Caulerpa lentillifera* in tanks and ponds is being investigated. Experiments on different levels of nitrogen, irradiance and salinity for *C. lentillifera* culture are on-going.

4. Adapting to climate change impacts

The Program aims to identify changes in the environment brought about by the changing climate that may affect the aquaculture sector, prepare the sector to the possible effects of these changes, minimize and mitigate the adverse impacts of climate, and ensure the continued operation of all aquaculture production systems under changing climatic conditions.

- *Generate scientific information on the effects of high water temperature on the reproductive performance of economically important marine aquaculture fishes*

One of the physiological processes highly affected by water temperature is reproduction. Among tropical marine fishes, very little is known about the effect of high temperature and acidic seawater on gonadal maturation and spawning.

The effect of elevated temperature on gonadal maturation and spawning in tropical marine aquaculture fishes was investigated in rabbitfish, *Siganus guttatus*. Gonadal development and spawning performance of breeders in 31°C were considered normal but gonadal development and spawning were disrupted in the group maintained at 33°C water and the effect became severe with prolonged exposure to the elevated temperature. In the group maintained at 33°C, most females had oocytes that were atretic. During 7 months of exposure to 33°C, spawning was observed only on 2 occasions and in both times, the eggs did not hatch.

The water temperature in the natural environment however, follows a diurnal fluctuation, with slightly lower temperature observed during night time compared to day time. To mimic the natural temperature fluctuation, another experiment was conducted following the diurnal fluctuation in the water temperature with slightly lower temperature at night compared to day time. There was a significant improvement in the gonadal maturation and spawning success of the breeders that were subjected to 33-

31°C temperature cycle. Gonadal development and spawning success in this group were high and comparable to the control and the 31-29°C temperature cycle group. These results indicate that rabbitfish can still spawn at 33°C as long as its daily exposure is not constant. Similar studies need to be done for milkfish and tilapia considering their importance to the aquaculture industry in the country and the region.

- *Generate scientific information on the effects of high water temperature on embryonic and early larval development of economically important marine aquaculture commodities*

Ensuring that embryonic development and early larval survival will proceed is important since the succeeding culture operations in the nursery and grow-out systems will depend on the success in the seed production for the supply of fry. Some studies addressing this issue are described below.

Marine fishes - milkfish, Asian sea bass, rabbitfish. The effect of high water temperature on embryonic development was investigated in economically important marine fishes like milkfish, Asian sea bass and rabbitfish. Embryonic development proceeded normally in all 3 species when fertilized eggs were incubated at ambient temperature of 28-29°C (control). In all 3 species, embryonic development was aborted when fertilized eggs were incubated at 33°C. Although embryonic development proceeded normally in embryos incubated in 31°C, hatching rate was lower compared with those incubated in ambient temperature. Hatching rates were always high (>80%) in the control group (ambient temperature).

The effect of high water temperature on larval survival after 10 days of rearing of the 3 species was also investigated. Newly-hatched larvae of milkfish, Asian sea bass and rabbitfish were reared for 10 days in water temperatures of 28-29 (ambient, control), 31 and 33°C. Stocking density was 30 larvae/l and larvae were fed rotifers daily. Survival of milkfish at ambient water temperature ranged from 8-24 % (mean of 19 %) whereas the survival (ranged from 0.1-3.2%; mean of 1%) was similar at 31 and 33°C. Rabbitfish larvae, being the most difficult to rear in the hatchery, did not survive at 33°C, and barely survived at 31°C (mean of 0.7%). Among the 3 species, Asian sea bass larvae survived the best at higher temperatures of 31°C (range of 6-44%; mean of 18%) and 33°C (range of 0.8-21%; mean of 6.5%). Survival of Asian sea bass at ambient temperature (range of 15-86%; mean of 45%) was very high.

Mollusks - Abalone (*Haliotis asinina*). The reproductive performance of abalone when exposed to elevated water temperatures was also investigated. Abalone breeders were exposed for 3 months to temperatures ranging from 27-28°C (ambient) to 33°C. Mature females did not survive the continuous high water temperature of 33°C as all died after 45 days of exposure, whereas a few males (10%) survived until day 60. Only 50% of the breeders survived for 3 months when exposed to 31°C whereas 80% survived in the ambient temperature. A significant reduction in feeding rates and consequently growth were observed in those exposed at higher temperatures. The study need to be repeated under conditions where the daily diurnal fluctuation in the water temperature is followed.

Crustaceans - Mud crab (*Scylla serrata*). The technologies for breeding and seed production of mud crab in captivity have been developed and recently were further improved by AQD. There are now mud crab hatcheries in the country and in the region. Some mud crab hatchery operators reported of non-spawning of mud crabs when the water temperature is high. This will be investigated starting 2016.

- *Promote public awareness on the possible effects of climate change to aquaculture activities*

Increasing the awareness of the fish farmers and the general public on the possible effects of climate change to aquaculture operations is a continuing activity of the Program. The AQD library is continuously sending updates and new information about the effects of climate change to aquaculture to all the staff. In addition, the training courses offered by AQD also include a lecture on climate change and its impact on aquaculture since 2013.

5. Meeting social and economic challenges in aquaculture

This Program aims to address the recommendations which were adopted during the June 2011 ASEAN-SEAFDEC Fisheries Conference on the following areas: (i) prioritizing collaborative R&D in aquaculture in the region to have a clear regional assessment and understanding of the role of aquaculture in poverty alleviation and provide basis for policy formulation; (ii) allocating R&D resources to address emerging issues on the impacts of climate change and global trade on aquaculture with emphasis on small-holder fish farmers; and (iii) enhancing multi-agency collaboration, sharing of information and resources to alleviate the socioeconomic conditions of the poor sector of region. The accomplishments are described below:

- *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*

The studies that address this objective have demonstrated that new aquaculture technologies such as the hatchery and nursery of giant freshwater prawn (GFP, *Macrobrachium rosenbergii*) to produce seeds for grow-out culture in cages can improve income in existing tilapia farming business in Laguna Lake. The hands-on demonstration of hatchery and nursery technology for GFP enabled the fisherfolks in Binangonan, Rizal to produce their own GFP postlarvae for polyculture with tilapia in cages. Tilapia seed production and grow-out farming has been an existing livelihood of many fisherfolks in Laguna Lake; and the co-culture with high-value GFP without additional feeding may increase their income.

The important role of aquaculture in stock enhancement was demonstrated through the production of hatchery-bred juveniles of threatened marine species such as abalone *Haliotis asinina*, and sandfish *Holothuria scabra* that are intended for release. Successful community-based enhancement strategies of these high-value export species were continued in Sagay Marine Reserve (SMR) in Negros Occidental with Japan Trust Fund (JTF6). Preparations and training of fisherfolks are underway for breeding and nursery of these species in stock enhancement sites. Results from the monthly monitoring of the released abalones showed that they may have established a breeding population in coral areas in the release demo-site in Barangay Molocaboc within the SMR since women and children gleaners already noted improved catch of abalones to supplement daily subsistence income.

In another study on the stock enhancement of tiger prawn, *Penaeus monodon* in New Washington Tributaries in Aklan that is being funded by the Research Institute for Humanity and Nature (RIHN) of Japan, five releases of tiger shrimps juveniles have been done. However, majority of the released juveniles were immediately caught by most fishing gears since fishers reported and surrendered their catches with tags. Hence, a review of allowable passive and active fishing gears used by fishers in the area is needed to complement the shrimp stock enhancement in the Batan Bay.

- *Allocating R&D resources to address emerging issues on the impacts of climate change and global trade on aquaculture with emphasis on small-holder fish farmers*

The potential applications of income-generating and eco-friendly culture technologies such as the integrated multi-trophic aquaculture (IMTA) in milkfish mariculture is being demonstrated through the family-based culture of milkfish with sandfish and seaweeds in Nueva Valencia, Guimaras. Seminars on the potential benefits from introducing IMTA in commercial mariculture sites in Regions 1, 7 and 11 around the Philippine archipelago were also conducted in collaboration with JIRCAS.

Another study conducted was a market and consumption study of indigenous high-value species (HVIS) such as giant trevally (*Caranx ignobilis*), silver therapon (*Leiopotherapon plumbeus*), tapiroid grunter (*Mesopristes sp.*) and lobed river mullet (*Cestraeus sp.*). The market study of HVIS showed that aquaculture R&D investments in giant trevally and silver therapon need to be prioritized due to high market demand and while breeders are still available in the wild. Initiatives have already been made by AQD on the breeding of silver therapon and should be continued in view of market demand. Collaboration for breeding of giant trevally has been initiated with BFAR's National Fisheries Research Development Institute (NFRDI).

- *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*

In 2015, the program has continued activities in collaboration with GOJ-TF6, RIHN, JIRCAS and a local food manufacturing company. Through the five on-going studies, aquaculture technologies either for grow-out culture or stock enhancement have been disseminated in partnership with relevant local government units (LGU), state college or university such as the Aklan State University in the project site, and local fisherfolk organization such as the Molocaboc Barangay Fisheries and Aquatic Resources Management Council (BFARMC), Pinamuk-an Small Fisherfolk Association (PSFA), Pandaraonan Unified Association (PUA).

Information, education and communication activities for relevant stakeholders including children who gather fishery resources such as abalone, sandfish and other shells and fishes in intertidal flats for food and cash were conducted to ensure compliance and cooperation on good fishing practices, regulations and policies to sustain benefits from stock enhancement in project sites.

Other R&D Activities

1. Institutional Capacity Development on Sustainable Aquaculture (ICDSA) and other Collaborative Projects

For the collaborative projects with BFAR, SEAFDEC/AQD has rendered technical assistance in the construction of multi-species marine fish hatcheries in different parts of the country. To date, the hatcheries in Baler, Aurora; Sta. Lucia, Palawan; Bongabong, Oriental Mindoro and Sta. Cruz, Davao del Sur have been completed and are already operational. SEAFDEC/AQD provides technical assistance in the operation of these facilities. The construction of the hatchery facilities in Sagnay, Camarines Sur is finished and will be turned over after inspection while construction of the hatchery facilities in Lao-ang, Samar and Odiongan, Romblon are on-going.

In partnership with the Philippine Government, SEAFDEC/AQD is also promoting mud crab culture in different parts of the country. Seven private sector collaborators underwent training at SEAFDEC/AQD on various phases of mud crab production. Moreover, on-site technical assistance was provided in the hatcheries of the collaborators. Memoranda of agreements (MOA) were forged with several academic institutions in Luzon, Visayas and Mindanao, Philippines for capacity building on mudcrab hatchery and nursery technologies and on-site technical assistance. SEAFDEC/AQD has also started transferring the nursery technology to the private sector and other stakeholders. For the blue swimming crab, capacity building started with the training of technical assistants working for the Philippine Association of Crab Producers Inc. on seed production of blue swimming crab at the SEAFDEC/AQD Crustacean Hatchery.

SEAFDEC/AQD is also working with Winrock International (an NGO) in implementing a development project for improved aquaculture production efficiency in the Philippines' CARAGA region. An on site technology forum and aquaculture clinic, attended by 220 participants was conducted in Butuan City. This was followed by the on site training course on feed and fish health management with 30 participants and an on-site training on mud crab nursery and grow-out culture, also with 30 participants. AQD's role is on capacity building in aquaculture through introduction of technologies that will enhance production of aquaculture species that are economically important in the region.

2. ABOT AquaNegosyo

For Agree-Build-Operate and Transfer (ABOT) Aqua Negosyo Program, a total of 37 inquiries were received from January to September of 2015. Most of these were from the Philippines; only 3 were from other countries (Maldives and Nigeria). Requests were varied, ranging from details of ABOT, recommendation on possible aquaculture investment ventures, information on the culture of different commodities, and assistance for rehabilitation of hatcheries and ponds. Inquiries were mostly on shrimps, crabs, milkfish, tilapia, and high value marine fish species such as groupers, snappers and seabass; a few were on abalone, oysters and freshwater prawn.

Among those that made inquiries, 7 became ABOT clients and all were local residents. Technical assistance is continuously being offered to local and/or international private sector clients through the ABOT Aqua Negosyo Program.

3. Training and Information

The training courses conducted in 2015 were on the following areas: marine fish hatchery; milkfish culture, farm management and operations; abalone, catfish, mud crab and sandfish hatchery, nursery and grow-out operations; culture of abalone and seaweeds; soft shell crab farming; feed formulation; good aquaculture practices in shrimps; and viral disease detection in crustaceans. A total of 197 trainees participated in the different aquaculture courses offered by AQD between January and mid- September. There are 11 courses in the pipeline for the 4th quarter of 2015. A distance learning course on principles of health management in aquaculture (Aquahealth online) with 40 participants was held in September 2014 until February 2015.

Apart from scientific publications, AQD's Development Communication Section has published 3 new manuals ('Culture of rotifer - *Brachionus rotundiformis* and brackishwater cladoceran -*Diaphanosoma celebensis* for aquaculture seed production', 'Soft-shell crab production using hatchery-reared mud crab', and 'Development and management of milkfish *Chanos chanos* Forsskal broodstock') and two monographs ('Important Findings and Recommendations on Chemical Use in Aquaculture in Southeast Asia' and 'Health Management of Milkfish *Chanos chanos*'). Flyers about SEAFDEC/AQD, its stations, programs and other information materials about the Department including the 2014 Highlights were also produced.

AQD's Development Communication Section also published the bimonthly issues of AQD Matters, did frequent updating of AQD website, posted stories about events at SEAFDEC/AQD in Facebook and Twitter, as well as press releases about SEAFDEC/AQD events and initiatives, and participated in fairs and exhibits. In 2015, SEAFDEC/AQD participated in major aquaculture exhibits held in the Philippines (6th Aquatech: Aquaculture Expo and Convention in Tagaytay City, National Science and Technology Week in Pasay City, and Agri-link in Metro Manila). AQD was also able to showcase its technologies to the delegates of Asia-Pacific Economic Cooperation (APEC) member economies who attended the High Level Policy Dialogue on Agricultural Biotechnology in Iloilo City in October. APEC delegates visited the Main Station of AQD and had a glimpse of its programs/activities. Preparations are also underway for the exhibit during the National Shrimp Congress in General Santos City in November. Apart from these initiatives, the Department's library project on SEAFDEC/AQD Institutional Repository (SAIR) has continued to enhance the accessibility of publications and the visibility of the Department. From January to September 2015 alone SAIR had 1,142,305 searches performed and 549,717 pdfs downloaded.

FishWorld, SEAFDEC/AQD's Museum of Aquatic biodiversity maintains a reference collection (currently consisting of >5000 species) and a live animal exhibit (>100 species) of various aquatic organisms. Ten high school local students availed of the internship programs on aquatic biodiversity conducted by FishWorld in 2015. FishWorld took the lead in a training course on Collection and Identification of Intertidal Mollusks in Casiguran, Aurora Province. FishWorld also has a longstanding work on endangered megafauna. In 2015, 32 more megafauna have been documented.

The above-mentioned activities have contributed to addressing the Department's mandate of timely dissemination of information and at the same time help enhance its visibility to its various stakeholders.

PLANS IN 2016

AQD will continue most of the studies/projects conducted in 2014. It will also give priority to addressing the important (present and emerging) issues that affect the region's sustainable aquaculture development.

List of Programs

Departmental Programs Implemented in 2015:

- a) Quality seed for sustainable aquaculture;
- b) Healthy and wholesome aquaculture;
- c) Maintaining environmental integrity through responsible aquaculture;
- d) Adapting to climate change impacts; and
- e) Meeting social and economic challenges in aquaculture

Proposed Departmental Programs for 2016:

- a) Quality seed for sustainable aquaculture;
- b) Healthy and wholesome aquaculture;
- c) Maintaining environmental integrity through responsible aquaculture;
- d) Adapting to climate change impacts; and
- e) Meeting social and economic challenges in aquaculture

PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Quality Seed for Sustainable Aquaculture
Responsible Department: SEAFDEC/AQD
Total Duration: 2012-2020
Funding Sources¹: Philippine Government
Estimated Budget for 2016: USD 564,800

1. INTRODUCTION

Success in the sustainable production of aquatic species for human consumption depends primarily on the availability of good quality seedstock apart from the adoption of optimal husbandry techniques. With the intensification of aquaculture systems in most of the countries in Southeast Asia and the environmental challenges such as those resulting from climate change, both factors -- genetic quality and culture management should be considered as equally important in ensuring a steady yield of good quality seeds and later, marketable products from aquaculture. Hence through this program, activities that determine optimal conditions and methods in sufficient, quality seedstock production are being pursued.

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 the refinement of hatchery and nursery management methods;
- Develop schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks; and
- Produce sufficient seedstock through the adoption of economically viable seed production systems.

2.2 Outcomes and Expected Outputs

- Good quality broodstock for both traditional and emerging species developed
- Quality and quantity of seedstock improved
- Schemes for production, management, maintenance and dissemination of improved stocks established

2.3 Project Description/Framework

The program shall cover studies and activities that will determine optimal conditions and methods for the production of quality seedstock in sufficient quantities. The research activities entail the use of 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. The purpose for the genetic intervention is to enhance traits such as growth rate, survival, disease/ stress tolerance that ultimately leads to the production of good quality seedstock. Both broodstock and seedstock improvement by way of nutritional intervention is also considered. Suitable hatchery and nursery protocols shall be developed and refined depending on the level of technology for each species. These technologies shall be verified and once mature, shall be packaged into the most viable or cost-

¹ Supplemental funds are also provided by other donors such as the Philippine's Department of Science and Technology, JIRCAS, GOJ-Trust Fund, ACIAR, etc.

effective method for broodstock and seed production. Finally, industry stakeholders or primarily the fish farmers shall be informed of the advances in seed production methods, through training, and the availability of seeds especially of the improved stocks through information dissemination and extension work.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2015

A. Development of good quality broodstock and implementation of proper stock management protocols

For aquaculture, the preference is for improved seedstock for better yield as these are grown to marketable sizes. For stock release, the seeds produced by quality spawners ideally needs to be genetically similar to the stocks in the receiving area to maintain the genetic integrity of the population in the enhancement site. Supportive breeding, or the use of broodstock from the enhancement site is often suggested to prevent further deterioration of the stocks in the release area. The following activities were conducted in 2015 to address this objective.

- Commercial species

Molecular markers that will identify stocks and consequently aid in determining the genetic quality are currently being developed for several commercial aquaculture species.

Molecular marker-based broodstock management method is being adopted for the Philippine milkfish *Chanos chanos* stocks. Samples (n=50/stock) were obtained from sixteen populations of wild and/or hatchery bred broodstock (including stocks from Indonesia where some seedstock are used in local commercial grow-out operations). Initially, genome sequence information determined through next generation sequencing was obtained to identify potential microsatellite markers that can be used to genetically characterize the aforementioned stocks. After optimizing DNA extraction and PCR amplification protocols, about 55 loci screened from 78 potential microsatellite markers were noted to be polymorphic. Nine microsatellite marker loci were finally identified as utilizable and were used to delineate stocks. Information on the primers was published in a paper entitled “Development and characterization of nine novel microsatellite markers for the milkfish *Chanos chanos*” in the Conservation Genetics Resources Journal. Using these markers, milkfish samples from three wild populations -- Claveria (CLA), Currimao (CUR), Camiguin (CAM); eleven local hatchery stocks and a hatchery stock from West Java in Indonesia (WJH), were examined. Genetic diversity indices such as expected heterozygosity (H_e) and allele frequency (A) ranged from 0.655 to 0.697 and 9.2 to 11.1, respectively. ANOVA showed significant but low genetic differentiation among the milkfish populations ($F_{ST} = 0.013$; $P=0.000$), for much of the variation is attributed to intrapopulation differences (98.6%). The oldest hatchery stock SIH (30-35 years) had relatively moderate genetic variability ($H_e = 0.66$, $A = 10.6$), which is lower than that of 5-year old SBH-II ($H_e = 0.687$, $A = 11.5$) considering that both stocks originally came from the same source in the wild. A reduction in genetic diversity was seen when a local hatchery stock was monitored after one generation. Finally, the Indonesian stock WJH had genetic variability levels comparable with local stocks. Results of these genetic analyses need to be considered in the context of promoting effective milkfish broodstock management practices for the production of good quality seed stock.

As for the abalone, aside from the current SEAFDEC hatchery stock, wild stocks from Pangasinan, Palawan, Zamboanga del Sur, Masbate, Sagay, Zamboanga del Norte and Cebu were collected and five families per stock are being produced for genetic assessment and evaluation of production characteristics. Molecular marker analysis for both milkfish and abalone are done at the Tohoku University where samples are analysed by the study proponents. In another study, molecular characterization of potential oyster broodstock from wild sources is currently being done by the University of the Philippines in the Visayas as part of the National Oyster R&D Program led by SEAFDEC/AQD with funds from the Philippine Department of Science and Technology.

Apart from genetic intervention, nutritional methods to improve reproductive performance in farmed aquatic commodities have been conducted. The sustainable production of marine annelids (*Marphysa*

mossambica) as feed for mud crab *Scylla serrata* broodstock was conducted. Various feed combinations of live polychaetes and polychaete meal as food for mud crab broodstock have been evaluated to improve reproductive performance and larval quality. Zoeal production per spawning of crab fed natural food (NF: mussel, fish, and squid at daily rotation) with live *Marphysa* was higher than those fed without live polychaetes. Increasing the level of *Marphysa* meal in formulated diet in combination with NF without live polychaetes correspondingly increased zoeal production.

In the oyster, *Crassostrea irredalei*, protocols for broodstock management and conditioning are being developed to maximize production. Faster gonadal development was observed in oysters stocked and reared to maturity in the estuary and in semi-intensively managed ponds than in tanks. Sexual maturity and histological index were high after 15 days of conditioning (DOC) where 90% of estuary-reared and 80% of the pond-reared broodstock were noted to be sexually mature having histological gonad indices (GI) of 490 and 480, respectively. Finally, when trials on the effect of salinity on gonadal maturation were conducted, at day 15, oysters reared in 20 ppt salinity were observed to be 60% and 40% in late active and ripe stages, respectively while oysters reared in 25ppt were noted to be 10% ripe and 70% in the late active stages. Oysters in 30 ppt were 25% ripe and 70% in the late active stages.

- *Emerging species for aquaculture*

Recently, a newly approved study is on the nutritional evaluation of wild-sourced and hatchery bred stocks of silver therapon, *Leiopotherapon plumbeus*, for feed development. One of the aims is to compare the growth and reproductive performance as well as the nutritional composition of wild and hatchery-reared silver therapon. Preliminary data showed that the mean gonado-somatic indices (GSIs) and the gut indices (GIs, %) of wild-sourced females and males were 4.74 and 4.43%, and 1.29 and 1.38%, respectively. Higher mean GSIs and GIs (%) were observed for the hatchery-bred stocks with 8.22 and 5.80%, and 3.08 and 2.00%, respectively for female and male silver therapon.

- *Species for stock management and enhancement*

Activities are being undertaken to study the giant grouper for purposes of broodstock development and genetic stock management. ACIAR is supporting preliminary work on broodstock collection and genetic variability assessment using molecular markers.

As for the seahorse *Hippocampus* sp., tissue samples were collected from the study site (Molocaboc Island, Sagay City), SEAFDEC seahorse hatchery and seahorse hatchery in Japan. Genetic characterization of collected seahorses was done. Only one species, *H. comes* was noted to be present in Molocaboc Island. Sequencing of mtDNA cytb and 16s rRNA genes were conducted in all six species of seahorses and a pipefish and phylogenetic trees were constructed to show the relationship among seahorse species. Primers HiSpiF1 and HiBarF1 were confirmed useful for the species identification of *H. spinosissimus* and *H. barbouri*. For *H. comes*, a microsatellite enrichment library was constructed and 35 primer pairs were designed to amplify potential microsatellite markers. Microsatellite marker analysis showed very low degree of differentiation among populations ($F_{st} = 0.086$) of wild and hatchery produced seahorses. Primers of *H. comes* microsatellite loci were successfully cross-amplified in other species of seahorses and a pipefish.

Apart from environmental manipulation, nutritional approaches are being applied to improve reproductive performance in the sandfish *Holothuria scabra* broodstock. Survival of the broodstock fed the shrimp feed and Sargassum powder was 100% when reared for the entire 8 week experimental run. The Navicula-fed group had 100% survival until the 7th week but only 80% survived until the end of the 8th week. When warm shock vs. cold shock was used in artificial spawning, the percentage of broodstock that spawned was 7% for those exposed to warm shock whereas it was 2% for those under the cold shock treatment.

Although known as a commercial species, blue swimming crab production is totally reliant on wild stocks. Hence it is important to first consider how one can effectively transport potential spawners from the wild to the farm to be used for seed stock production either for aquaculture or stock enhancement/management. A study tried to determine a suitable protocol for the transport of blue swimming crab broodstock. Results

showed that survival rates of *P. pelagicus* subjected to various loading densities and duration in a simulated transport set up did not differ significantly ($P > 0.05$).

B. Refinement of hatchery and nursery management methods to improve seedstock quality and production

- *Commercial aquaculture species*

In the abalone, hatchery production has been improved with the administration of microparticulate diets as alternative feed. An agar-bound microparticulate diet has been formulated based on the nutrient profile of post larval abalone. Proximate analysis of the composition of the microparticulate diet (MPD) showed higher levels of crude protein at 47.2% and lipid at 8.9% compared to 14.9% crude protein and 2.1% lipid for the diatoms (*Navicula* sp). When fed a combination of natural food and microparticulate diet for 90 days, mean shell length was highest (21.95mm) for hatchery-bred stocks. This was slightly higher than those of the wild stocks (20.72mm) given the same feeding treatment. Mean % survival was also highest for the hatchery and wild stocks fed a combination of natural food and MPD, with rates ranging from 38.6% to 43.3% regardless of feeding duration.

In another study, in an effort to increase abalone juvenile production through the improvement of hatchery culture techniques, the efficiency of using chemical cues (positive ions, algal extracts) to improve settlement rate was evaluated. Settlement inducers such as magnesium chloride hexahydrate and dopamine hydrochloride were tried and it was noted that use of dopamine hydrochloride at 10^{-6} M resulted to higher settlement rate of 32.67-37.33% than the control (22-32%). Meanwhile, magnesium chloride hexahydrate had no settlement inducing effect at all concentrations that were tested. As for the algal extract, the algae *Nitzschia* sp. was noted to consistently induce high abalone settlement and survival rate. Settlement rate after 10 days ranged from 4.20-4.77% while post-settlement survival (90 d) was 52.91%. Finally, an experiment was conducted to develop an efficient sorting and harvesting protocol and this involved the use of anaesthetic agents as muscle relaxant for abalone juveniles. The dose of 1 ppt (1.0 ml/L) 2-phenoxyethanol resulted to shortest detachment time of 6 min in 2.6-3cm juveniles but shortest recovery time of 3.8 min was observed in 0.25 ppt. Benzocaine showed comparable detachment time of 14.05-14.98 in 3 concentrations, but a shorter recovery time of 20 min was observed at 150 ppm. As for larger juveniles (5-6cm), 2 phenoxyethanol gave the shortest detachment time of 4.7min in 1 ppt concentration and the shortest recovery time of 6.1 min at 5 ppt concentration.

In the oyster, the combined spawning methods of dessication with flow-through UV-irradiated water were used in the production of quality oyster seedstock. It was observed that milt from one male when mixed with 0.50 M – 4 M eggs resulted to 100% fertilization; however, hatching rate (HR) was higher (39 – 48.5%) when sperm solution was mixed with 0.75 M – 2M eggs. The most suitable substrate for settlement were empty oyster shells (OS) with settlement of 0.95 spat/cm², then marble stones (MS) and polyethylene strips (PES) with settlement of 0.78 spat/ cm² and 0.23 spat/ cm², respectively; spats can be detached easily from PES than from OS and MS. To improve spat production, treatment of epinephrine bitartrate was tried apart from the use of down-welling vs. upwelling settlement units. Epinephrine bitartrate (EPI) treated pediveligers resulted to 100% settlement (SR) and survival rate (S) of $64.7 \pm 19\%$. Finally methods of remote setting of oysters were tried and results showed that survival of pediveligers transported with water was higher ($77\% \pm 1\%$) than those transported without water ($61 \pm 8\%$).

Efforts have been made to further improve mudcrab hatchery schemes. Mudcrab larvae reared using three types of SEAFDEC/AQD formulated diets as treatments, namely Diet A (2% squid meal or SM), Diet B (2% annelid meal or AM) and Diet C (1% AM) plus a control diet composed mainly of natural food, showed no significant difference in terms of survival. In another experiment, when the survival and population development index (PDI) of crab larvae *S. serrata* fed diets containing polychaete meal, squid meal or their combination were monitored, results showed that larvae fed the following treatments, namely: Diet A: 2% squid meal; Diet B: 2% polychaete meal; and Diet C: 1% squid plus 1% polychaete meal, resulted in similar ($p > 0.05$) larval PDI.

Apart from mudcrabs, larval studies have been done on the blue swimming crab (BSC) *Portunus portunus*. BSC larvae were fed natural food and commercially available shrimp formulated diets (lansy,

japonicus and monodon) to reduce use of natural food that requires more labor and facilities. Results showed no significant differences in the survival and growth among the treatments. Another experiment involved a stress test to determine larvae quality using formalin at varying concentrations and exposure duration (formalin levels :0, 80, 120, and 140 ppm at 0.5, 1, 2, 3, 4, 5, 6 and 24 h duration). Results showed that as the formalin concentration increased, cumulative larval mortality (%) also increased. Thus a formalin stress test may be used to determine the quality of the newly hatched BSC zoeae for seed production. In terms of the use of antibiotics during larval rearing, it was noted that BSC megalopae can still be produced without antibiotics if larval quality is good.

As regards nursery rearing of the BSC, an experiment to test the salinity requirement of later crab instar stages was conducted. A comparison of molt intervals among test salinities of 16, 20, 28 and 32 ppt showed that the number of days between molts were similar in all treatments. In a separate experiment, the most suitable feeding regime for BSC nursery was evaluated. Crab instars were fed formulated test diets 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. A confirmatory run will be conducted to validate the results. To further refine methods for nursery rearing of BSC, trials to identify the most suitable substrate and shelter were done. After three weeks of nursery rearing (Phase 1), crab instars which were initially stocked at 600 individuals/m² gave survival rates of 36.61 ± 3.15% (pipe shelters), 36.33 ± 3.95% (control), 45.83 ± 5.05% (framed nets), and 49.44 ± 4.34% (net curtains).

To enable the promotion of *Kappaphycus* culture, nursery rearing techniques are being refined. Tissue cultured cultivars are produced in the laboratory and reared in the land-based nursery tanks and in sea cages. The protocol in the land and sea-based nurseries is continuously being optimized to shorten the culture in vitro and ex vitro. Meanwhile, tissue culture explants were successfully outplanted in Bohol, Zamboanga, and Guimaras. The propagules grew up to the 4th pruning stage only.

- *Emerging species for aquaculture*

Silver therapon *Leiopotherapon plumbeus* is a promising species for commercial inland aquaculture particularly because it is an indigenous species and it commands a good market price. Rotifer strains (*Brachionus rotundiformis* and *B. plicatilis*) were tested as starter food for first feeding larvae. *B. rotundiformis* is a suitable starter food for first feeding silver therapon larvae; recommended feeding protocol as follows: *B. rotundiformis* from 2 to 13 days after hatching (DAH), *Artemia* nauplii from 14 to 35 DAH, and co-feeding of *Artemia* nauplii and artificial diet from 36 to 95 DAH. Another aspect of silver therapon larviculture that was studied was on the ideal stocking density for growth and survival. It was noted that larvae attained best growth (19.7 mm total length; 126.3 mg wet weight) and highest survival (81.4%) at 5 L⁻¹ after 35 days of rearing (from 7DAH). A microparticulate diet was also tried on silver perch larvae and preliminary results showed that weaning time did not have a significant effect on final length (18.1–19.5 mm) and body weight (94–104 mg) of *L. plumbeus* larvae, which were comparable to that of the control group (21.2 mm TL; 102 mg).

Improvements in the hatchery and nursery production of sandfish *Holothuria scabra* have been undertaken. Refinements in the hatchery protocol include the use of appropriate food and stocking densities. It was noted that *Chaetoceros*-fed larvae had better survival, faster development and less deformities.

C. **Development of schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks**

- *Commercial species*

Selective breeding programs have continued for selected commodities (milkfish, mudcrab, shrimp and abalone) with support from SEAFDEC/AQD and the Philippine Department of Science and Technology. For the mudcrab, a newly approved proposal on the selective breeding was approved and will have as breeding goals, the development of a disease resistant stock and a fast growing strain of mudcrab. A mass selection scheme shall be adopted for both traits. Preparations are underway for the collection of additional breeders apart from the production of parental stocks for selective breeding. For the milkfish,

with the outcome of the molecular marker studies, plans for comparing growth in stocks known to potentially have high genetic variability and/or fitness shall be evaluated and reared through field trials in ponds. Plans to undertake genomic research *e.g.* to look for markers for sex determination and tolerance to environmental stressors are to be undertaken as well.

Hybridization is being continuously implemented using the local commercial abalone species (*Haliotis asinina*). *H. asinina* has been crossed with other Philippine abalone species, *Haliotis planata* and *Haliotis glabra*, to enable the production of stocks/species with improved traits. Some of the findings of this research reported that pure *H. asinina* and hybrid *H. glabra* attained optimum growth after 420 days of culture or DOC (*H. asinina*: 38.6 g; hybrid *H. glabra*: 36.0 g) while hybrid *H. planata* attained optimum growth at a longer culture period of 450 DOC, but heavier (44.16 g). The stocks are being grown to become potential broodstock. The gonads of the potential breeders did not improve (stage 1 and stage 2). All have been tagged (750pcs) and will be returned to the Igang Marine Station for reconditioning. All of the hybrids are being maintained. Some samples of the hybrid stocks were sent to Prof. Arai of Hokkaido University for genetic characterization.

Ice-ice disease in seaweeds is a problem. Methods to develop resistant strains of the seaweed *Kappaphycus* and reduce epiphytes are being studied. Haploids, diploids and TCs are planted in lines and were installed inside a net cage. Occurrence of the ice-ice was monitored by counting the bundles with ice-ice and divided by the total number of bundles multiplied by 100 per line. Fertilized *Kappaphycus* have been found to be less susceptible to ice-ice. Diploid *Kappaphycus* have higher specific growth rate than haploids and the carrageenan quality from both diploids and haploids are not different. Carrageenan viscosity of the diploid is significantly higher than the haploid. Finally the carrageenan quality of *Kappaphycus* produced from spores is not different.

D. Adoption of economically viable systems to produce sufficient seedstock

Several fish/shellfish production projects are being implemented at AQD to demonstrate the viability of small-scale and/or large-scale seed production systems. Mass production of sex-reversed and mixed-sex Nile/red tilapia fingerlings as well as large scale production of abalone juveniles, are continuously being done. In the small-scale Nile tilapia hatchery, about 200,000 Nile tilapia and 7,900 red tilapia swim-up fry were produced. Catfish are also being produced in the same hatchery.

For the abalone, juvenile production is on-going. A total of 41,370 abalone juveniles (5mm-8mm SL) have been produced with an average survival rate of 1.23% and then reared further until 1.1 -1.5cm in size. A total of 12,500 juveniles were sold.

The experiments on reverse day-night cycle and the use of *Nitzschia* sp. as diatom diet were conducted to further improve abalone juvenile production. Initial large-scale production of abalone juveniles was done using *Nitzschia* sp. as diatom feed in 12-ton outdoor tank stocked with 1,500,000 veliger larvae. Using this set-up, the survival rate of abalone juvenile (5mm-8mm SL) was 0.20% and yielded 3,033 abalone juveniles. Another trial was done using two 3-ton tanks stocked with 300,000 veliger larvae and it resulted to an average of 1.33% survival rate yielding a total of 7,960 abalone juveniles.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2016

4.1 Planning of the Project Activities

Studies/activities will continue to focus on: (i) development of good quality broodstock for both traditional and emerging species through domestication, genetic and nutritional intervention and the implementation of proper stock management protocols; (ii) improvement of quality and quantity of seedstock through the development and refinement of hatchery and nursery management methods; (iii) development of schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks; (iv) production of sufficient seedstock through the adoption of economically viable seed production systems; and (v) building the capacity of fishfarmers and other industry stakeholders in appropriate breeding and larval rearing technologies through training, extension and information dissemination.

4.2 Expected Outputs in 2016

Shrimps:

- Improved growth, breeding/reproductive performance; healthy broodstock produced; inbreeding minimized.
- Protocols (sex ratio, stocking density from market size to broodstock) established.
- Technology for sustainable production of captive broodstock developed.

Freshwater prawns:

- Effective broodstock management schemes for giant freshwater prawn developed.
- Cost-effective and low pollution prawn broodstock diet developed

Muscrab/blue swimming crab:

- Larval rearing protocol improved
- Mass production method of annelids established and tested as feed for mud crab
- Reduced cannibalism
- 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

Marine fishes:

- Fry quality improved through broodstock management
- Genetic stocks screened; information used for broodstock management.
- Improved maturation diet for milkfish available.
- Methods to reduce cannibalism determined; schemes to improve survival determined.
- Improved survival from 70% to >80% and lower FCR (Grouper fingerling production in cages in ponds)
- Optimal conditions for seed production/larval rearing established.
- Nursery rearing of marine fishes improved (verification run using optimum stocking density and AQD formulated feeds conducted).
- Target production achieved.

Freshwater fishes:

- Tilapia fingerlings (sex-reversed and mixed sex Nile tilapia hybrid) produced; income generated; production target attained.
- Breeding and seed production protocol defined for emerging species.
- Larval rearing methods optimized for emerging species.

Shellfishes:

- Feeding preference of alternative benthic diatom for hatchery rearing of abalone verified.
- Improved hatchery methods (survival rate of veliger larvae increased through improvement of harvest and incubation protocol).
- Genetic stocks for broodstock production and selective breeding in abalone evaluated.
- Effective diet for abalone broodstock developed.
- Effective microparticulate diet (MPD) for abalone hatchery developed and 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 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: Aquaculture Department
Total Duration: 2012-2020
Funding Sources¹: Philippine Government
Estimated Budget for 2016: USD 432,000

1. INTRODUCTION

Healthy and wholesome aquaculture is one of the thematic programs aimed to address the role of attaining sustainable aquaculture production through provision of protein needs for the growing human populace. Although research and development efforts on this aspects have already resulted in phenomenal growth of the sector in the last decades or so, there is still a need for further studies on this aspect since we are faced with challenges posed by ecological, economic, and climatic changes among others that we now encounter in our present situation. In order therefore to be assured of significant improvements and production sustainability for future generations, there is a need to consider working more on this healthy and wholesome aquaculture program. This Program aims to contribute to improvement of aquaculture production through innovations in nutrition and feeding and fish health management and in preserving the environmental integrity of aquaculture.

2. PROJECT

2.1 Objectives

- 1) 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 transboundary pathogens;
- 2) Promote the wider use of conventional diagnostic as well as new methods especially for newly reported, emerging diseases;
- 3) Find effective alternative safe drugs/chemicals (including natural products) to manage aquaculture diseases in lieu of the harmful chemicals and drugs which have been discouraged or banned for use due to quality and safety issues;
- 4) Find different sources of fish meal substitutes and develop effective feed management schemes that incorporate sound management;
- 5) Develop aquafeeds for selected species at specific growth stages especially for species or stages for which no artificial feed has been formulated; and
- 6) Promote better understanding of the concept of feed conversion ratio (FCR) and adequate nutrition and efficient feeding practices among fish farmers to promote fish health.

2.2 Outcomes and Expected Outputs

- The application of probiotic *Bacillus* species in larval rearing of *Peneaus* is established
- Field- tested immunostimulants for important marine species
- Identified causative agent for the two months mortality syndrome including ways to prevent or control disease occurrence/outbreak
- Bacterial and viral vaccines for the grow out of fish and crustaceans developed
- Zoonotic bacteria and parasites from cultured organisms identified
- Health status of wild shrimp stocks (primarily WSSV and other potential pathogens) updated

¹ Supplemental funds are also provided by other donors such as the Philippines' Department of Science and Technology, USAID, JIRCAS, United Soybean Board (USA), ACIAR, Japan Fisheries Research Agency

- Economics of producing mudcrab juveniles for soft-shell crab farming identified
- Fish health specialists from Member Countries trained on fish disease diagnostics (through Government of Japan trust funds)
- Effective feed management developed and different sources of fish meal substitutes identified
- Efficient diets developed for specific species at specific growth stages
- Netcage culture of freshwater prawn and tilapia in semi-commercial scale demonstrated

2.3 Project Description

The Program is critical in attaining significant improvements and sustaining aquaculture production in the face of many challenges posed by present and future ecological, economic, as well as, climatic changes. The strategies invoked in this Program will concentrate on improving the nutrition and feeding management practices to promote healthy farmed aquatic animals; disease diagnosis, control, monitoring and surveillance of aquatic animals; and environmental integrity, certification, and food safety. The optimization and sustainability of aquaculture production shall be based on Best Management and Good Aquaculture Practices to ensure the least impact on the environment.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2015

- *Investigation on the efficacy of indigenous probiotics*

An indigenous poly- β -hydroxybutyrate (PHB) containing bacterial cultures were incorporated in the feed and given to Shrimp PL1 and shrimp PL30 for 30 days and thereafter respectively challenged with *Vibrio campbellii* and exposed to a lethal dose of ammonia. Growth and survival were found higher for shrimps receiving the PHB accumulating bacteria as compared to shrimp receiving diets without bacterial additions before the bacterial challenge and ammonia exposure. Shrimp fed PHB accumulating bacteria showed a higher survival compared to non-treated shrimp after the bacterial challenge suggesting an increase in robustness for the shrimp. On the contrary, survival of shrimp exposed to lethal dose of ammonia did not significantly differ between PHB accumulating bacteria-fed shrimp and non-PHB treated shrimp. Current data clearly illustrate that indigenous bacilli capable of accumulating PHB can provide beneficial effects to *P. monodon* post-larvae during culture in conjunction with growth performance, survival and resistance against pathogenic infection and ammonia stress.

Another indigenous probiont (*Bacillus subtilis* G100R11) possessing antimicrobial and quorum-sensing activity against *V. harveyi*, a known pathogen in mudcrab hatcheries, was also isolated. Simulated hatchery runs showed that oral administration of *B. subtilis* could confer protection in mudcrab as evidenced by the successful production of crab instar with a survival rate of 1%, which is better than the commercial probiotic control with 0% survival. Confirmatory trials are ongoing.

- *Application of diagnostics that will ensure biosecurity within culture system*

Two major oyster-producing areas located in Cabugao Bay, municipality of Panay (Western Visayas, Philippines), were investigated for their sanitary quality. The values obtained were above the microbiological standard set by EU for “Class A” production area. Lower *V. parahaemolyticus* counts (<3.0 MPN/g) and absence of *V. cholerae* were noted in all oysters examined. Because oyster production areas located in Barangay Cabugao examined in Year 1 were identified as “Class C” based on *EU Shellfish Harvesting Area Classification Criteria*, 3 sampling stations in the deeper portion of Cabugao Bay were chosen as potential stations for relaying experiment. Oysters that will be used for the relaying and depuration experiments will be collected from the aforementioned oyster production areas.

The quantity and composition of *Aeromonas* spp. in the rearing water, sediment, gills and intestines of tilapia *Oreochromis niloticus* collected every 2 weeks from Day 30 to Day 120 after stocking for grow-out culture in 6 earthen brackish water ponds were also investigated. *Aeromonas* spp. are known opportunistic pathogens of tilapia. In terms of composition, a total of 3 species were identified with the dominance of *A. hydrophila* followed by *A. sobria* and *A. salmonicida* in all samples examined. Moreover, since the use of commercial antibiotics has been a common practice in tilapia hatchery and grow-out culture operations as prophylactic or therapeutic agent, the resistance of *Aeromonas* species isolated from the water, sediment, gills and intestines of tilapia to 10 antibiotics commonly used in tilapia culture was also investigated.

More than 95% of *Aeromonas* species tested were resistant to amoxicillin followed by erythromycin (92%), neomycin (90%) and oxytetracycline (86%). Only 2% of the strains exhibited resistance to chloramphenicol and none to norfloxacin. The multiple antibiotic resistance indexing of *A. hydrophila* strains tested generally showed that they originated from high-risk sources.

- *Promoting the wider use of conventional diagnostic as well as new methods especially for newly reported, emerging diseases*

Diseases affecting farmed and wild mud crab including predisposing, risk and protective factors, and possible prevention and control measures of the diseases were studied. External examination of mudcrab samples collected from the wild and grow-out ponds showed several abnormalities such as short abdominal flap; discoloration of the abdominal region; darker carapace, (necrotized) holes on carapace, claw and legs; presence of lumut/fouling organisms; and presence of barnacles *Balanus* sp. on the carapace. Internally, necrotic gills, black/brown gills, and discolored gonads were observed. Stalked barnacles, *Octolasmis* spp. were observed in the gills. Among the known viral diseases, only white spot syndrome virus (WSSV) and infectious hypodermal and haematopoietic necrosis virus (IHHNV) were detected with WSSV solely implicated in mortality cases. Identified risk factors for WSSV include low temperature and presence of WSSV positive shrimp. A total of 1450 bacterial isolates were also recovered from the hemolymph. Pathogenicity tests of 20 representative bacteria isolated in pure form suggested that these opportunistic bacteria could only induce mortality when mudcrabs are stressed such as when they are newly molted.

Currently, there is lack of a comprehensive online information resource on shrimp pathogens with a centralized facility to store and archive isolates collected from outbreaks all over the country. To fill this need, a database of aquatic pathogens occurring in the country was recently instituted to ensure sustainability of the Philippine aquaculture industry. Samples from shrimp farms in different regions in the country were collected. A total of 1321 bacterial isolates were collected and biobanked. These samples came from 79 countrywide sites covering regions in Luzon, Visayas, and Mindanao. Of these, 27 sites were found to be disease-positive (WSSV, luminous vibriosis, IHHNV, MBV, and AHPND). To obtain meaningful information from the data generated, database software intended for web-based accessibility by users was developed. The biological data are accompanied by epidemiological information collected on site during sample collection. A Biobank Room dedicated for storing and archiving isolates that is compliant to at least level 2 biosafety and biosecurity standards has been recently established in SEAFDEC/AQD. OPSPiR is scheduled for launching in the last quarter of 2015.

In conjunction with the ongoing study on the development of shrimp pathogen diagnostic tools using nested PCR and lateral flow strip biosensors (LFSB) coupled with a mobile app and cloud-based information management, preliminary data revealed that the detection limit of LFSB kit is only at par with 1-step optimized WSSV PCR method. Refinements are currently being undertaken to improve the detection limit of LFSB kit, *i.e.* to be at par with the nested-step of the optimized WSSV PCR method.

- *Evaluating the effectiveness of natural products to manage aquaculture diseases in lieu of harmful chemicals*

Infectious diseases of bacterial etiology are some of the constraints limiting mudcrab hatchery production. Lack of alternatives to antibiotics (whose use has been banned or discouraged due to food safety concerns) has hampered the production of adequate seeds to spur production in grow-out facilities. Two plants extracts (*Terminalia catappa* local name: Talisay and *Nephelium lappaceum* local name: Rambutan) were tested to have antimicrobial activity *in vitro* (agar disc diffusion method) and *in vivo* (oral administration followed by bacterial challenge). Simulated hatchery runs showed that oral administration of *T. catappa* successfully produced crab instar with a survival rate of 1.2% and 1.8% in trials 1 and 2 comparable to antibiotic control.

- *Finding different sources of fish meal substitutes and development of effective feed management schemes that incorporate sound management*

Experiments revealed that fermented cowpea could replace 40% of fishmeal in milkfish feed. In another study on milkfish, the 50% fish meal replacement with defatted soybean meal and 40% for soy protein

concentrate have been tried both in marine cages in Igang, Guimaras Province and brackish water pond in Dumangas, Iloilo. Results showed that the use of this SEAFDEC-USB diet gave a lower FCR (cages-1.6; ponds-1.8) compared to milkfish commercial feed (cages-2.3; ponds-2.6). The SEAFDEC-USB-fed stocks also attained a marketable size of >400 average body weight in less time. Distillers dried grain solubles (DDGS) could replace 45% of soybean meal in milkfish diet. This is being verified in milkfish culture in marine cages in Igang. Moreover, 10-15% inclusion of milkfish hydrolysate in grouper feed has been tested in a small scale experiment. In abalone, studies have shown that the fertilized *Ulva pertusa* can be considered as fish meal substitutes for juvenile feed, but not *Sargassum* sp.

- *Development of aquafeeds for selected species at specific growth stages especially for species or stages for which no artificial feed has been formulated*

The study conducted in pompano found that taurine requirement for juveniles was around 1.5% at 46% protein. In another study on abalone, the refinement of diet formulation for the grow-out culture resulted in a water stable and highly digestible feed that significantly improved growth rate and shortened the culture period. The meat quality of the abalone fed the refined formulated feed, as determined through Hedonic scale taste testing, was comparable in terms of color, odor, taste, texture and general acceptability with those abalones fed seaweeds.

- *Promotion of better understanding of the concept of feed conversion ratio, and adequate nutrition and efficient feeding practices among fish farmers to promote fish health*

This is being addressed through various studies. High yield was obtained in rearing of giant freshwater prawn with high substrate area equivalent to 120% of cage bottom and with a stocking density of 5 prawns/m². In another study on milkfish, the use of a feed where fish meal was partially replaced with soybean-based ingredients in grow-out culture both in marine cages and brackish water ponds gave a lower FCR of 2.1 compared to 3.4 FCR for commercial feed. For mud crabs, the spherical and tubular shape feeds facilitated feeding and resulted in higher feed consumption by the crabs. *Ascetes* sp., squid meal, shrimp paste and spoiled fish flesh were also found as good attractants for mud crab feeds. In another experiment, mud crab crablets produced in the nursery can be used for subsequent production of 60-80g juveniles attaining high survival with stocking density of 0.5 individuals/m². Strategies to reduce cannibalism in mud crab nursery include the use of shelters. Frame ribbon nets were found to be the most suitable for the nursery with 60-70% survival at density of 50 individuals/m². For the white shrimp, *Penaeus indicus*, it was found that a stocking density of 10/m² for 60 -day grow-out culture period was economical.

Demonstration of semi-intensive grow-out culture of grouper using feeds formulated by SEAFDEC/AQD has been done in brackish water pond. Fish fed the SEAFDEC/AQD phase diet showed higher growth and survival rates and lower feed conversion ratio (FCR) compared to fish fed a commercial diet. The same results were obtained in the production of rabbitfish in semi-intensive farming using SEAFDEC/AQD formulated diet in brackish water pond.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2016

4.1 Planning of the Project Activities

Major program activity	Duration	Remarks
Prevention and mitigation of diseases in mud crab culture	2015-2018	New study funded by DOST-PCAARRD.
Quantitative and qualitative analyses of the bacterial microbiota implicated in persistent, emerging and re-emerging diseases of high-density net-caged tilapia cultured in lakes in the Philippines	2016-2017	Proposal for DOST-PCAARRD funding in preparation
Refinement of immunization regimen against VNN in high value marine fishes	2015-2019	
Field application of the LFSB kit for WSSV detection	2016-2017	Phase 2 proposal for DOST-PCAARRD funding in preparation

Major program activity	Duration	Remarks
Establishment of a Philippine shrimp pathogen bio-bank and online biosurveillance information resource (Phase 2)	2016-2017	Phase 2 proposal for DOST-PCAARRD funding in preparation
Efficacy of indigenous probionts and plant extracts against vibriosis in mudcrab hatcheries	2016-2017	New proposal for DOST-PCAARRD funding in preparation
Demonstration of the viability of <i>P. indicus</i> culture in ponds using low-cost diet	2016-2017	Viability of <i>P. indicus</i> culture in ponds using low cost diet demonstrated
Refinement of existing grow-out diet Production cost and return analysis	2016	Refinement of existing grow-out diet for <i>P. indicus</i>
Improvement of feed production for grow-out mud crab (on-going)	2016	Feed production for grow-out mud crab improved
Improvement of feed formulation using SEAFDEC USB diet (on-going)	2016	Use of USB SEAFDEC diet in 10 x 10m in floating cages
Field testing of formulated diet containing DDGS as replacement to soybean meal	2016-2017	Use of soybean meal replacement with DDGS in Igang and ponds demonstrated Poultry by-product meal utilized as feed ingredient for milkfish diet
Utilization of poultry by-product meal in milkfish	2016-2017	
Demonstration of economics of production using SEAFDEC diet	2016-2017	Economics of production for SEAFDEC diet for grouper demonstrated
Formulation of SEAFDEC diet for pompano	2016-2017	Existing for diet formulation for pompano refined Nutritional requirements of pompano identified Nutritional requirements of pompano identified Color quality of final product defined (golden) (the golden color for the final product as required by consumers will be considered)
Formulation of SEAFDEC diet for seabass	2016-2017	Amino acid requirement of seabass juveniles identified
Testing of refined grow-out diet	2016-2017	Refined abalone grow-out diet tested in sea cages; Use of <i>Ulva sp.</i> In abalone diet
Feeding management strategies for silver therapon	2016-2017	Effective feeding management strategies for grow out silver therapon identified
Utilization of agricultural by-products as feed ingredient for tilapia	2016-2017	
Feed development for <i>C. ignobilis</i>	2016-2017	
Culture of <i>Gracilaria</i> in ponds	2016-2017	

4.2 Expected Outputs:

Nutrition and Feed Development

- Viability of *P. indicus* culture in ponds using low cost diet demonstrated
- Refinement of existing grow-out diet for *P. indicus*
- Feed production for grow-out mud crab improved

- Use of USB SEAFDEC diet in floating cages demonstrated
- Use of soybean meal replacement with DDGS in Igang and ponds demonstrated
- Poultry by-product meal utilized as feed ingredient
- Economics of production for SEAFDEC diet for grouper demonstrated
- Existing for diet formulation for pompano refined
- Nutritional requirements of pompano identified
- Amino acid requirement of seabass juveniles identified
- Refined abalone grow-out diet tested in sea cages
- Use of *Ulva sp.* In abalone diet
- Effective feeding management strategies for grow out silver therapon identified

Fish Health

Prevention and mitigation of diseases in mud crab culture

- Microbial load (WSSV, *Vibrio*) in water/soil/mudcrab that would result in infection/mortality quantified using qPCR;
- Environmental parameters that would affect infection/mortality of mud crab identified
- Epidemiological data generated

Quantitative and qualitative analyses of the bacterial microbiota implicated in persistent, emerging and re-emerging diseases of high-density net-caged tilapia cultured in lakes in the Philippines

- Threshold level to bacterial load in water, sediment, gills and intestines of healthy tilapia reared in floating net cages in lakes established
- Composition of bacterial microbiota in tilapia and environment generated
- Zoonotic bacteria identified

Refinement of immunization regimen against VNN in high value marine fishes

- Immunogenicity of inactivated vaccine to broodfish of high value marine fish verified
- Kinetics of antibody production
- Timing of booster vaccination
- Vertical transmission of the virus aborted

Efficacy of indigenous probionts and plant extracts against vibriosis in mud crab hatcheries

- Efficacy of the probionts and plant extracts verified

Field application of the LFSB kit for WSSV detection

- Improved detection limit of LFSB kit, *i.e.* at par with nested-step of optimized PCR method.

Establishment of a Philippine shrimp pathogen bio-bank and online biosurveillance information resource (Phase 2)

- Epidemiological information including genetic, phenotypic, ecological, spatial, and temporal characteristics of shrimp and fish pathogens generated uploaded in database

PROJECT DOCUMENT

Program Categories: Departmental Programs

Project Title: Maintaining Environmental Integrity through Responsible Aquaculture

Responsible Department: SEAFDEC Aquaculture Department (SEAFDEC/AQD)

Total Duration: 2012-2020

Funding Sources¹: Philippine Government

Estimated Budget for 2016: USD 69,822

1. INTRODUCTION

The Program was developed to address issues on the negative impacts of aquaculture to the environment and how these impacts will be minimized. It has been known that the phenomenal growth of aquaculture has caused modification, destruction or complete loss of habitat; unregulated collection of wild broodstocks and seeds; translocation or introduction of exotic species; loss of biodiversity; introduction of antibiotics and chemicals to the environment; discharge of aquaculture wastewater, thus coastal pollution; salinization of soil and water; and dependence on fishmeal and fish oil as aquaculture feed ingredient, to name a few. Asia, the birthplace of aquaculture, has been and is still experiencing all these. Particulate organic wastes from fecal materials and uneaten food in intensive aquaculture production have the greatest potential to generate waste. These wastes can enrich aquatic ecosystems and may bring about physical and chemical changes in the water and sediment which may result to anoxic condition in extreme cases. Pond, pen and cage culture systems of both finfish and crustaceans can generate huge amount of organic waste that may cause drastic change to the natural ecosystems adjacent to them.

SEAFDEC/AQD which has been developing aquaculture techniques for various species of finfish, crustaceans, mollusks and some new emerging species to boost fisheries production in the Philippines and the Southeast Asian region should also take the lead and be responsible in looking at the impacts of these aquaculture activities to the environment.

2. PROJECT

2.1 Goal /Overall Objectives

Goal: Develop environment-based aquaculture technology by integrating environmental factors in SEAFDEC/AQD research activities and to maintain environmental integrity by promoting responsible aquaculture practices.

Objectives:

- 1) Assess impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems;
- 2) Identify appropriate extractive species that may be used in Integrated Multi-Trophic Aquaculture (IMTA);
- 3) Develop and promote efficient and suitable environment-friendly culture systems; and
- 4) Conduct biological and ecological studies on species with potentials for resource enhancement.

2.2 Outcomes and Expected Outputs

- Changes in biodiversity, water and sediment qualities due to aquaculture and related activities known; recommendations to mitigate the impacts of aquaculture formulated
- Efficiency of different extractive species (seaweeds, sandfish, bivalve mollusk) in assimilating nutrients, sulfides and other aquaculture effluents assessed
- Production of selected commodities used in Integrated Multi-Trophic Aquaculture determined

¹ Supplemental funds are also provided by JIRCAS, ACIAR

- Appropriate culture protocols in ponds, pens in ponds and other systems for sandfish determined
- Models on carrying capacity of and decision support tools for selected inland water bodies in the Philippines available
- Improved production of sandfish, abalone, mud crab in stock enhancement sites identified for the program
- Efficient and suitable environment-friendly culture systems and practices promoted through training and information dissemination activities

2.3 Project Description/Framework

The program will generally focus on the impacts of aquaculture on the environment and how to minimize them. Aside from the goals that the program aims to achieve, it will also incorporate issues presented during the ASEAN-SEAFDEC Conference on Sustainable Fisheries such as the need for better management of the aquaculture sector; abuse in the use of feeds and fertilizer and poor feed utilization and feeding management; excessive use of antibiotics and chemicals; environmental imbalance due to the destruction of habitats which leads to depletion of fish population and loss of biodiversity; and the development of IMTA in a tropical environment.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2015

A. Summary of Accomplishments and Outputs

- *Assess impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems*

As a first step to accomplish this objective the initial step was the assessment of the impact of the activities of the various stations of SEAFDEC/AQD (with its aquaculture operations) on biodiversity, sediment quality and other environmental parameters. Monitoring of the different stations of SEAFDEC/AQD and its adjacent areas were conducted for Igang Marine Station (IMS), Tigbauan Main Station (TMS) and Binangonan Freshwater Station (BFS). Monitoring activities have been done for the Dumangas Brackishwater Station in previous years. These studies have been completed.

- *Identify appropriate extractive species that may be used in Integrated Multi-Trophic Aquaculture (IMTA)*

A number of studies under this objective have been completed. The nutrient requirement, utilization and assimilation of sandfish was conducted with funds from JIRCAS. In another study, a protocol for the polyculture of milkfish with sandfish was also done.

The integrated multi-trophic aquaculture using a combination of milkfish, sandfish and seaweeds is currently being conducted. This study, funded by JIRCAS aims to quantify the extent of eutrophication caused by aquaculture. This IMTA experiment uses pens stocked with milkfish, sandfish and seaweeds. Stocking was recently done in August and monitoring of environmental parameters as well as the various production traits of the IMTA species are on-going. Data from this experiment will be used to estimate nutrient flow within an IMTA system. A separate monitoring of a milkfish mariculture site was also started in April to determine various environmental (*e.g.* temperature, tidal current, in situ chlorophyll fluorescence, dissolved oxygen). The data, once completed will be used for creating a numerical model of the nutrient flow within a milkfish mariculture system.

- *Develop and promote efficient and suitable environment-friendly culture systems*

A number of studies under this objective are underway for the following commodities: sandfish *Holothuria scabra*, abalone *Haliotis asinina*, slipper oyster, giant freshwater prawn *Macrobrachium rosenbergii*, and seaweed *Caulerpa lentillifera*.

Culture trials of sandfish *Holothuria scabra* in ponds and searanch is a project funded by ACIAR in collaboration with other local institutions. The project has produced in 2015 a total of 9470 juveniles of

the species. After careful assessment, two experimental nursery sites (1) in a protected cove in Brgy Pandaraonan, off the main Igang Marine Station (IMS); and (2) an open bay in Polopina Island, Concepcion, Iloilo were established. For the grow-out sites, potential sites assessed in Capiz, Antique, Iloilo, and Guimaras were found to be unsuitable for full grow-out, but deemed suitable for nursery; hence, appropriate substrate conditioning was done.

Four prospective sandfish searanch sites have been assessed among various islands in Concepcion with the best site found in Sitio Looc, Polopinya Island. Zoning and delineation of the sea ranching sites have been completed. Recently, the same protocol of sea ranch establishment was used for the second sandfish sea ranch site in Brgy. Pandaraonan, Nueva Valencia, Guimaras. Memorandum of Agreement was similarly signed between and among SEAFDEC/AQD, local government unit of Nueva Valencia, local community and fisherfolk/farmers' organization. Ranch site delineation and assessment were conducted in August 2015.

The hatchery of the Northern Iloilo Polytechnic State College (NIPSC) was refurbished and set-up for production trials of sandfish. For this purpose, a formal agreement between SEAFDEC/AQD and NIPSC was signed. To engage the local community into active participation in the project, social resource mapping activities were conducted to understand their way of life and determine local knowledge of their resources and its distribution.

In the case of the abalone, *Haliotis asinina*, a study on its grow-out culture in small islands and/or community started in 2014. Stocking density experiments in nursery systems in reef flats and in tanks showed that mean shell length (SL) and body weight (BW) is inversely proportional to stocking density. Significant differences in SL and BW were observed among different stocking densities. The optimum stocking density recommended for nursery culture trials in both sites is 400 individuals/m² since it showed comparable SL and BW with those grown using the lowest stocking density while survival remained high.

Density experiments in grow-out in reef flats also showed inverse relationship between stocking density and production parameters based on preliminary results after 150 days of culture.

The research on slipper oyster, funded by the Philippines' Department of Science and Technology (DOST) aims to increase its production through refinement of grow-out culture technologies. Based on the results using various methods to culture oyster in the previous year, pouch was chosen as the best and was used in the second experiment to determine the best site for oyster culture. In July 2015, thirty 90x50 cm pouches with 25 compartments each, were hung on three 1.5x2 m rafts in Batan Bay in New Washington, Aklan. A similar experimental set-up was done in Dumangas, Iloilo in the same month. Each site has 2,250 pieces of oysters. Spats used in both site were harvested from New Washington, Aklan. Another site will be in Ajuy, Iloilo where grow-out will be incorporated as part of the IMTA project.

The grow-out culture of the giant freshwater prawn in an alternative system using biofloc system was recently started. The first experiment started in September 2015 in indoor tanks using three carbon sources: molasses, brown sugar and potato starch. The control has no extraneous carbon source.

The optimization of culture of the seaweed *Caulerpa lentillifera* in tanks and ponds is being investigated. Experiments on different levels of nitrogen, irradiance and salinity for *C. lentillifera* culture are on-going. Results showed that gross photosynthesis (GP) was obtained at treatments without fertilizer and 0.6 ppm N at 210 $\mu\text{mol photons m}^{-1} \text{sec}^{-1}$. GP was highest at salinities of 25 and 30 ppt, at 110 $\mu\text{mol photons m}^{-1} \text{sec}^{-1}$.

- *Conduct biological and ecological studies on species with potentials for resource enhancement*

The promotion of the resource enhancement of seahorse was initiated which will develop appropriate transport and acclimation strategies of seahorses from the hatchery to the release site. The study will also determine the appropriate size of seahorses for release and the time of the day of release as well as develop appropriate monitoring strategies of released stocks. Recovery, growth and survival of released stocks will also be assessed. The involvement of the local community in the management of the natural resources will also be promoted as part of the activities of the study.

Major program activity	Duration	Remarks
Objective: <i>Assess impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems</i>		
Hydrographic profiling of Igang Marine Station	2012-2014	completed
Marine biodiversity around the SEAFDEC Aquaculture Department in Tigbauan, Iloilo	2013-2014	completed
Impact of aquaculture in a freshwater environment: Biodiversity of aquatic fauna at the east and west cove of the Binangonan Freshwater Station	2013-2015	completed
Biodiversity in the milkfish and shrimp fry fishery in the surf zones in southern and western Panay	2013-2014	completed
Objective: <i>Identify appropriate extractive species that may be used in Integrated Multi-Trophic Aquaculture (IMTA)</i>		
Polyculture of suitable finfish species with sandfish	2012-2014	terminated
Development of Integrated multitrophic aquaculture (IMTA) techniques for livelihood improvement	2015-2017	To continue
Objective: <i>Develop and promote efficient and suitable environment-friendly culture systems</i>		
Culture trials for sandfish <i>Holothuria scabra</i> in ponds and sea ranch (Old title: Determination of optimal conditions for sandfish <i>H. scabra</i> culture)	2012-2016	To continue; funded by ACIAR
Grow-out of abalone in small islands and/or community	2014-2016	To continue; funded by DOST
Refinement of existing oyster grow-out techniques	2014-2017	To continue; funded by DOST
Giant freshwater prawn culture in biofloc system	2015-2017	To continue
Culture of <i>Caulerpa</i>	2015-2017	To continue
Responsible aquaculture through aquasilviculture	2015-2019	Reported under GOJ-TF
Objective: <i>Conduct biological and ecological studies on species with potentials for resource enhancement</i>		
Stock enhancement of mud crabs <i>Scylla</i> spp. in the mangroves in Panay)	completed	Reported under GOJ-TF Stock Enhancement Program
Community managed sandfish (<i>Holothuria scabra</i>) sea ranching and stock release	completed	Reported under GOJ-TF Stock Enhancement Program

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2016

4.1 Planned Activities for 2016

Major program activity	Duration	Remarks
Objective: <i>Assess impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems</i>		
Impact of aquaculture in a freshwater environment: Evaluation of other inland water bodies in Luzon area heavily impacted by aquaculture	2016-2018	New
Objective: <i>Identify appropriate extractive species that may be used in Integrated Multi-Trophic Aquaculture (IMTA)</i>		
Development of Integrated multitrophic aquaculture (IMTA) techniques for livelihood improvement	2015-2017	To continue
Objective: <i>Develop and promote efficient and suitable environment-friendly culture systems</i>		
Determination of optimal conditions for sandfish <i>Holothuria scabra</i> culture	2012-2016	To continue; funded by ACIAR
Grow-out of abalone in small islands and/or community	2014-2016	To continue; funded by DOST
Refinement of existing oyster grow-out techniques	2014-2017	To continue; funded by DOST
Giant freshwater prawn culture in biofloc system	2015-2017	To continue

Major program activity	Duration	Remarks
Culture of Caulerpa	2015-2017	To continue
Responsible aquaculture through aquasilviculture	2015-2019	To continue; funded by GOJ-TF
Objective: <i>Conduct biological and ecological studies on species with potentials for resource enhancement</i>		
Promotion of resource enhancement of seahorses	2015-2019	Reported under GOJ-TF Stock Enhancement Program

4.2 Expected Outputs in 2016

- Extent of eutrophication caused by aquaculture quantitatively elucidated
- Model estimation of nutrient flow within IMTA system in the field done
- Appropriate management conditions for IMTA operation
- Optimum density of abalone in the most suitable container determined
- Improved growth and survival of abalone using improved artificial diet and seaweeds
- Best culture environment for abalone by comparing growth and survival in pond, land-based tanks and small island reef farming was determined
- Site requirements for oyster farming established
- Growth and survival data of wild and hatchery-produced spats reared in the natural environment available
- Best practices for oyster farming developed
- Suitable carbon source for biofloc system in grow-out of giant freshwater prawn determined.
- Culture conditions of *C. lentillifera* optimized.
- The time required for a mangrove habitat to remove nutrients (*i.e.* N, P) from shrimp farm effluents determined
- Local sandfish hatchery established at Concepcion to produce at least 5,000 S1 juveniles
- Socio-economic, political conditions at sea ranch sites established
- Appropriate transport and acclimation strategies of seahorses from the hatchery to the release site determined
- Appropriate size of seahorses for release and the time of the day of release established

PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Adapting to Climate Change
Responsible Department: Aquaculture Department
Total Duration: 2012-2020
Funding Sources: Philippine Government
Estimated Budget for 2016: USD 87,311

1. INTRODUCTION

The threat to our planet from the changing global climate is real. In recent years, several parts of the world have experienced abnormal weather patterns/disturbances like extended dry spell that leads to intense drought, frequent heavy rains resulting to severe flooding, more frequent and stronger typhoons and hurricanes, among others. The occurrence of these abnormalities was largely attributed to global climate change.

The changes in the climate are projected to impact broadly across ecosystems increasing pressures on all livelihoods and food supply chains, including the fisheries and aquaculture sectors. The future food supply will be a central issue as food resources come under greater pressure. In particular, the sustainability of aquaculture will be further challenged since the effect of these climatic changes on the aquaculture organisms in general, the different aquaculture systems and structures, the various support systems to aquaculture operations, and to the fish farmers, are largely unknown. The small-scale fish farmers in the region that produce the great bulk of the aquaculture production are largely vulnerable since they are dependent on aquaculture operations for food and income. Some urgent adaptation measures are therefore required in response to the threats to food and livelihood provision that may arise due to the changing climatic conditions observed around the globe.

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 impact(s) of climate change in aquaculture, and ensure the continued operation of all aquaculture production systems under changing climatic conditions.

2.2 Objectives

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. To achieve this, scientific information are necessary as basis for future interventions. These information are addressed in the specific objectives below:

- 1) To gather scientific information on the susceptibilities of various economically important aquaculture species to the combined effects of high seawater temperature and acidity.
- 2) To 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.
- 3) To promote awareness to the fish farmers and the general public on the possible effects of climate change to aquaculture operations.
- 4) To 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.

- 5) To collaborate with other institutions in the country and in the region in gathering baseline information on the effects of climate change to mangrove ecosystem.
- 6) To explore potential adaptive measures to mitigate the impact(s) of climate change to the different aquatic farming systems.
- 7) To 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.

2.3 Program Description/Framework:

Activities of the program include the important issues and recommendations that were discussed during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020, Fish for the People 2020: Adaptation to a Changing Environment. Areas in the region that are vulnerable to climate change-related effects will be identified and the kind of probable impact(s) will be determined so that appropriate adaptive measures can be proposed. The fish farmers and the general public will need to have better understanding about climate change and its likely impact(s) to their livelihood opportunities for better preparation and adaptation. Since largely almost nothing is known how climate change will affect the biology of various species presently farmed and the various support systems, series of experiments will be conducted to gather important scientific data that will serve as basis for the mitigation measures that will be provided. Improvements and innovations on the different aquaculture holding systems and structures are also necessary in order to lessen and/or reduce the impact to fish supply production.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2015

- a. *Generate scientific information on the effects of high water temperature on the reproductive performance of economically important marine aquaculture fishes*

Considering the very stable and narrow fluctuations of environmental factors like water temperature in the tropical region, marine organisms living in this area are more susceptible to some physiological effects when exposed to environmental changes beyond what is normally experienced, compared to organisms living in the temperate areas. One of the physiological processes that are highly affected by water temperature is reproduction. Among tropical marine fishes, very little is known about the effect of high temperature and acidic seawater on gonadal maturation and spawning.

Whether gonadal maturation and spawning in tropical marine aquaculture fishes is affected by elevated water temperature was first investigated in rabbitfish, *Siganus guttatus*. This species is a good model fish for this kind of research since the breeders are not big (>300 g BW) and hence the holding tanks for the breeders are also small (10 m³ volume). These characteristics allow for an easy set-up of a recirculating system for the heated seawater to maintain the desired water temperature. For this, three groups of rabbitfish breeders (n=80/group, sex ratio of 1:1) were separately stocked in 3 units of 10 m³ rectangular concrete tanks. During the first 3 months, all 3 tanks were supplied with water at ambient temperature (27-29°C). As expected, gonadal development and spawning performance of the 3 groups were high and considered normal. Starting on the 4th month, the water temperature in the 2 tanks was increased to 31°C and 33°C, the third tank was maintained at ambient water temperature (control group) and gonadal development and spawning performance were continuously monitored monthly for 7 months. A recirculating set-up with water heater and thermostat was installed to maintain the desired water temperatures. Gonadal development and spawning performance of breeders in 31°C were not much affected but gonadal development and spawning in the group maintained at 33°C water were bad and the effect became severe with the time of the exposure to the elevated temperature. In the group maintained at 33°C, most females had oocytes that were atretic. During 7 months of exposure to 33°C, spawning was observed only on 2 occasions and in both times, the eggs did not hatch.

The water temperature in the natural environment however, follows a diurnal fluctuation, with slightly lower temperature observed during night time compared to day time. Thus, maintaining a constant water temperature within a day and throughout the whole 7 months experimental period, as done in the experiment described above, was not realistic. To correct this, another experiment was conducted following the diurnal fluctuation in the water temperature with slightly lower temperature at night

compared to day time. For this, one group of breeders was subjected to a day time (7 AM - 4 PM) water temperature of 31°C and night time (5 PM – 6 AM) of 29°C (or 31-29°C temperature cycle). Another group of breeders was subjected to a day time temperature of 33°C and night time temperature of 31°C (or 33-31°C temperature cycle). The third group of breeders, which serves as the control, was subjected to the normal ambient water temperature with day time water temperature at 28-29°C and night time water temperature of 27-28°C. Gonadal development and spawning performance of the 3 groups were continuously monitored monthly. Under these conditions, there was a significant improvement in the gonadal maturation and spawning success of the breeders that were subjected to 33-31°C temperature cycle. Gonadal development and spawning success in this group were high and comparable to the control and the 31-29°C temperature cycle group. These results indicate that rabbitfish can still spawn at 33°C as long as its daily exposure is not constant.

Considering its importance to the aquaculture industry in the country, milkfish production being the second highest aquaculture commodity produced after seaweeds, it is necessary that reproductive performance of milkfish in captivity be assessed whether it will continue to spawn in water temperature of 33°C as predicted by Intergovernmental Panel on Climate Change. Considering however, the size of the milkfish broodstocks (> 4 kgs BW) and their holding tanks (200-500 m³ volume), it will be a challenge to conduct this kind of investigation in milkfish breeders. A good set-up to recirculate the heated water in order to maintain the desired water temperature in this large volume of tank is needed. This will entail substantial financial resources for its implementation. In addition, the same investigation will be done for tilapia considering its importance to the aquaculture industry. Both milkfish and tilapia are important species that address the food security agenda of the national government and the other AMS, especially tilapia. For these 2 fish species, the scientific literature will be extensively reviewed to assess the temperature tolerance at various life stages.

b. Generate scientific information on the effects of high water temperature on embryonic and early larval development of economically important marine aquaculture commodities

Embryonic development and early larval stages are two stages in the life cycle of an aquatic organism that is highly affected by water temperature. Ensuring that embryonic development and early larval survival will proceed is important since the succeeding culture operations in the nursery and grow-out systems will depend on the success in the seed production for the supply of fry. Some studies addressing this issue is described below.

Marine fishes - milkfish, Asian seabass, rabbitfish. The effect of high water temperature on embryonic development was investigated in economically important marine fishes like milkfish, Asian seabass and rabbitfish. Newly-fertilized eggs of milkfish, Asian seabass and rabbitfish that were spawned in ambient water temperature were incubated in 1-L beakers at egg density of 100/L at 3 different temperatures, namely, ambient (control), 31 and 33°C. Each temperature group had 5 replicates and the experiment was conducted 3-4 times. Embryonic development was monitored during the 24-hour incubation period and hatching rate was determined after incubation. As expected, embryonic development proceeded normally in all 3 species when fertilized eggs were incubated at ambient temperature of 28-29°C (control). In all 3 species, embryonic development was aborted when fertilized eggs were incubated at 33°C. Although embryonic development proceeded normally in embryos incubated in 31°C, hatching rate was lower compared with those incubated in ambient temperature. Hatching rates were always high (>80%) in the control group.

The effect of high water temperature on larval survival after 10 days of rearing of the 3 species was also investigated. Newly-hatched larvae of milkfish, Asian seabass and rabbitfish were reared for 10 days in 250-l fiberglass tanks with water temperatures of 28-29 (ambient, control), 31 and 33°C. Stocking density was 30 larvae/l and larvae were fed rotifers daily. Each treatment had 3 replicate tanks and the experiment was repeated 3 times. Survival of milkfish at ambient water temperature ranged from 8-24 % (mean of 19 %) whereas the survival (ranged from 0.1-3.2%; mean of 1%) was similar at 31 and 33°C. Rabbitfish larvae, being the most difficult to rear in the hatchery, did not survive at 33°C, and barely survived at 31°C (mean of 0.7%). Among the 3 species, Asian seabass larvae survived the best at higher temperatures of 31°C (range of 6-44%; mean of 18%) and 33°C (range of 0.8-21%; mean of 6.5%). Survival of Asian seabass at ambient temperature (range of 15-86%; mean of 45%) was very high.

Mollusks - Abalone (*Haliotis asinina*). The reproductive performance of abalone when exposed to future levels of water temperatures as predicted by IPCC was also investigated. Abalone breeders were exposed for 3 months to temperatures ranging from 27-28°C (ambient) to 33°C. Mature females did not survive the continuous high water temperature of 33°C as all died after 45 days of exposure, whereas a few males (10%) survived until day 60. Only 50% of the breeders survived for 3 months when exposed to 31°C whereas 80% survived in the ambient temperature. A significant reduction in feeding rates and consequently growth were observed in those exposed at higher temperatures. The experiment, however, needs to be repeated since the temperature setting was constant all day throughout the duration of the experiment, a condition that does not exist in the natural environment. The daily diurnal fluctuation in the water temperature where night time water temperature is slightly lower than day time water temperature need to be followed.

Crustaceans - Mud crab (*Scylla serrata*). The technologies for breeding and seed production of mud crab in captivity have been developed and recently were further improved by AQD. There are now mud crab hatcheries in the country and in the region. Some mud crab hatchery operators reported of non-spawning of mud crabs when the water temperature is high. This will be investigated starting 2016.

- c. *Increase the awareness of the fish farmers and general public on the possible effects of climate change to aquaculture operations*

Increasing the awareness of the fish farmers and the general public on the possible effects of climate change to aquaculture operations is a continuing activity of the Program. The more aware the people are of this issue and the better is their understanding of the phenomena, the more prepared they will be in facing the challenges posed by these factors. Towards this, AQD library is continuously sending updates and new information about the effects of climate change to aquaculture to all the staff. In addition, the training courses offered by AQD also contain a lecture on this issue since 2013. From the feedback received from the trainees, the inclusion of this lecture topic in the training courses was very much appreciated since they now become aware of this very important issue since it will most likely affect future aquaculture activities.

4. PROPOSED ACTIVITIES FOR THE YEAR 2016

4.1 Planning of the Project Activities

Major program activity	Duration	Remarks
Studies to generate scientific information on the effects of high temperature and acidity on reproductive performance	2016-2017	will be done on milkfish, mud crab, grouper and seabass
Studies to generate scientific information on effects of increasing temperature and acidity on early development	2016-2017	will be done on marine fishes (pompano, groupers, red snapper)
Investigation on effects of increasing temperature and acidity on susceptibility to diseases	2016-2017	
Investigation on effects of climate change on common microalgae/zooplankton	2016-2017	To be done by thesis students
Investigation on lablab production during wide and abrupt temperature and salinity fluctuations	2016-2017	To be done by thesis students
Studies to determine relationship of environmental parameters on occurrence of diseases, reproduction and seaweed production	2016-2017	
Survey to search for high temperature, more acidic-tolerant species (stocks)	2016-2020	
Trials to develop culture techniques for candidate resilient species	2016-2020	
Production and dissemination of climate	Continuing	

Major program activity	Duration	Remarks
change information relevant to aquaculture		
Review and consolidation of data/studies done	2016-2017	
Mapping of aquaculture sites and areas most vulnerable to effects of climate change	2016-2017	Country: to be done in cooperation with Philippine partners-Bureau of Fisheries and Aquatic Resources and Department of Science and Technology Region: in cooperation with SEAFDEC Member Countries

4.2 Expected Outputs in 2016

- Scientific data on the effects of increasing temperature or pH on: (1) gonadal maturation and spawning in mud crab and milkfish established; (2) embryonic development, larval survival of pompano and red snapper will be generated.
- Scientific data on the effects of increasing temperature or acidity on susceptibility to diseases (ice-ice and epiphytes) of seaweeds will be generated.
- Scientific data on the effects of climate change on reproductive performance, growth, survival and nutritional profile of microalgae and zooplankton commonly used in hatcheries will be generated.
- Scientific data on lablab production and composition in ponds during wide and abrupt temperature and salinity fluctuations.
- Scientific data on the correlation of changes in environmental conditions (high temperature and acidity) on the occurrence of diseases, reproduction and seaweed production.
- Presence and location of high temperature and acidic tolerant species known.
- Culture techniques for resilient candidate species established
- Public will be aware on the effect of climate change to aquaculture activities
- Temperature tolerance of various stages of important aquaculture commodities known
- Vulnerable areas/sites used for aquaculture activities in the country and the region mapped.

PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Meeting Social and Economic Challenges in Aquaculture
Responsible Department: Aquaculture Department
Total Duration: 2012-2020
Funding Sources¹: Philippine Government
Estimated Budget for 2016: USD 78,933

1. INTRODUCTION

Growth of aquaculture in the Southeast Asian region is driven by the scientific and technological breakthroughs developed and the adoption of culture technologies by receptive entrepreneurs. However, the development of aquaculture in the region has brought and caused a number of unintended problematic scenarios, such as: 1) inequitable distribution of opportunities and benefits across adopters of aquaculture; 2) technology and production cost dualism among aquaculturists; 3) social conflicts and economic losses due to competing uses of resources for aquaculture and other purposes; and 4) high cost of rehabilitation of habitats affected by misuse of natural resources for aquaculture.

This Program aims to develop and implement social and economic strategies in aquaculture and resource management to secure food and income through stakeholder collaboration.

2. PROJECT

2.1 Objectives

The main objective is to respond to the specific recommendations for meeting the social and economic challenges in aquaculture identified and adopted during the *ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People"* in June 2011. These include:

- 1) Prioritizing collaborative R&D in aquaculture in the region to have a clear regional assessment and understanding of the role of aquaculture in poverty alleviation and provide basis for policy formulation;
- 2) Allocating R&D resources to address emerging issues on the impacts of climate change and global trade on aquaculture with emphasis on small-holder fish farmers; and
- 3) Enhancing multi-agency collaboration, sharing of information and resources between and among SEAFDEC and its Member Countries and other organizations in addressing the common problems of alleviating the socio-economic conditions of the poor sector of region.

2.2 Outcomes and Expected Outputs

- Economically viable and sustainable aquaculture enterprises adopted
- Prototype aquaculture technology adoption model for securing food and livelihood for inland and coastal communities
- Enabled participation of rural communities in sustainable stock enhancement and aquaculture initiatives
- Policy and governance recommendations on resource management
- Improved multi-agency collaboration in addressing the common problem of alleviating the socio-economic conditions of the rural communities and small-holder farmers
- Establishment of social science regional network initiated

¹ Supplemental funds are also provided by the Government of Japan Trust Fund, JIRCAS, RIHN (Japan)

2.3 Program Description/Framework

The R&D activities of the Program intend to address the four categories of social and economic problems in aquaculture discussed and adopted for development of action plans during the *ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People"*. These issues define the scope and coverage of the Economic Challenges in Aquaculture Program (MSECAP) as follows: (i) enhancing the role of aquaculture in addressing food, income and livelihood security through improved governance, multi-agency collaboration, and comprehensive and interdisciplinary approaches; (ii) promoting sustainable aquaculture through enabling policies that support the management of natural and environmental resources; (iii) enabling mechanisms, institutions and infrastructure to encourage adoption of better aquaculture practices; (iv) understanding and improving linkages from production to marketing and trade of fishery products to support small and medium enterprise (SME) development; and (v) strengthening the capacity of aquaculture stakeholders by mainstreaming specific rural and peri-urban aquaculture programs and policies in local, national and international development programs.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2015

Major program activity	Remarks
<p><u>Prioritizing collaborative R&D in aquaculture</u></p> <p>The hands-on demonstration of hatchery and nursery technology for giant freshwater prawn (GFP), <i>Macrobrachium rosenbergii</i>, enabled the first batch of ten fisherfolks in Binangonan, Rizal to produce their own GFP postlarvae to be polycultured with tilapia in cages. Tilapia seed production and grow-out farming has been an existing livelihood of fisherfolks in Laguna Lake; the combined culture with high-value GFP without additional feeding has offered an opportunity for increase in farmers' income. This study has demonstrated that new aquaculture technologies such as the hatchery and nursery of GFP to produce seeds for grow-out culture in cages can improve income in existing tilapia farming business in Laguna Lake.</p> <p>The important role of aquaculture in stock enhancement has continued to be demonstrated through the production of hatchery-bred juveniles intended for stock enhancement of threatened marine species such as abalone <i>Haliotis asinina</i>, and sandfish <i>Holothuria scabra</i>. Successful community-based enhancement strategies of these high-value export species were continued in Sagay Marine Reserve (SMR) in Negros Occidental through Japan Trust Fund (JTF6).</p> <p>Stock enhancement of tiger prawn <i>Penaeus monodon</i> in New Washington Tributaries in Aklan is being funded by the Research Institute for Humanity and Nature (RIHN). Five releases of tiger shrimps juveniles have been done and fishers reported and surrendered those with tags. Analysis however showed that majority of the released juveniles were immediately caught by most fishing gears. Hence, a review of allowable passive and active fishing gears is needed to complement the shrimp stock enhancement in Batan Bay, Aklan.</p> <p><i>Allocating R&D resources to address emerging issues due to climate change and global trade</i></p> <p>The potential applications of income-generating and eco-friendly culture technologies such as the integrated multi-trophic aquaculture</p>	<p>The sustainability of completed rural aquaculture technology dissemination studies were limited by lack of easy access to breeders and fingerlings.</p> <p>Monthly monitoring of the community-based stock enhancement of abalones continue to show that they established in the release demonstration site in coral areas in Barangay Molocaboc within the Sagay Marine Reserve; women and children gleaners already noted improved catch of abalones to supplement daily subsistence income.</p> <p>Results also showed that technology adoption might be hindered by variable and reactive type of support from local government unit (LGU) and people's organization (PO) collaborators, especially for on-field and community-based technology dissemination strategies.</p> <p>Local fisherfolks and local government unit that host the family-</p>

Major program activity	Remarks
<p>(IMTA) in milkfish mariculture is being demonstrated through family-based culture of milkfish with sandfish and seaweeds in Nueva Valencia, Guimaras. Seminars on the potential benefits from introducing IMTA in commercial mariculture sites in Regions 1, 7 and 11 around the Philippine archipelago were conducted through collaboration with JIRCAS.</p> <p>In anticipation of the declining supply of some indigenous fish species due to overfishing, high demand and degradation of their habitat, a market and consumption study of indigenous high-value species (HVIS) such as giant trevally or <i>maliputo</i> (<i>Caranx ignobilis</i>), silver therapon or <i>ayungin</i> (<i>Leiopotherapon plumbeus</i>), tapiroid grunter or <i>pigek</i> (<i>Mesopristes sp.</i>) and lobed river mullet or <i>ludong</i> (<i>Cestraeus sp.</i>) were conducted.</p> <p><i>Enhancing multi-agency collaboration at the local and international levels</i></p> <p>The program in 2015 continued its collaboration with GOJ-TF6, RIHN, JIRCAS and private sector (local food manufacturing company). Information, education and communication activities for relevant stakeholders including children who gather fishery resources such as abalone, sandfish and other shells and fishes in intertidal flats for food and cash were conducted.</p>	<p>based IMTA set-up expressed appreciation of the livelihood opportunity and aquaculture skills learned under the collaboration.</p> <p>Initiatives have already been made by AQD on the breeding of silver therapon and should be continued in view of market demand. Collaboration for giant trevally breeding has been initiated with partners but needs further negotiations. Private sector funding can be expected for these HVIS.</p>

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2016

4.1 Planned Activities for 2016

Major program activity	Duration	Remarks
Demonstration of giant freshwater prawn grow-out, nursery, hatchery technology to fisherfolks in Laguna Lake	2016-17	
Continuation of community-based stock enhancement studies	2015-2019	
Value chain analysis of seaweed farming	2016-2020	
Implementation of the second run of the IMTA demonstration with fisherfolk collaborators	2016-2017	
Enhancement of multi-agency collaboration at the local and international levels.	2016-2017	

4.2 Expected Outcomes/Outputs

- Strategies for enhancing adoption of freshwater prawn grow-out culture in net cages (Laguna Lake in Luzon) established.
- Community-based abalone stock enhancement protocol, and socio-economic and governance strategies for coastal communities in the Sagay, Negros Occidental developed.
- Value chain analysis of seaweed farming initiated.
- Strategies defined for intermediate culture and release of shrimps to enhance stocks and contribute to area capability development in Batan Bay, Aklan province.
- Findings of the ex-ante study of IMTA in milkfish mariculture validated with stakeholders.

TRAINING DEPARTMENT

1. OVERALL REVIEW

In 2015, TD conducted three projects under Departmental program. The project of Promotion on strengthening of SEAFDEC Visibility and Image was implemented to strengthen and encourage TD and SEAFDEC visibility to public. Imparting knowledge of fisheries information through SEAFDEC's role to public was the main output by conducting exhibition, AFT magazines. Moreover, the electronic files of AFT magazine and other information were produced and distributed to TD network by this channel. In 2016, the project will be continued. Understanding on SEAFDEC /Departments 'roles and activities, delivery of fisheries information to stakeholders and the public, tools and management information system of organization are expected to be outputs of this project implementation.

Ten Tailor-made Training Programs was organized through training courses and study tour programs, based on the need and requirement from the partners to develop of human capacity building of partner and also Member Countries. According to this, the tailor-made training courses and study tour programs will be continued to conduct, designed and planned out by through the consultation and agreement between 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 based on the cost recovery and actual expenses

Moreover, the project of Improvement of Fisheries Technology and Reduction of the Impact from Fishing will be continued. The main activities are promotion of appropriate technologies and practices of fishing marine engineering, fisheries research, and database for deep-sea fisheries resource survey. The outcomes and expected outputs are technology transfer and development through enhancement of strengthening on coordination and collaboration with other relevant agencies on the issues related to fishing technology, marine engineering, fisheries information and database. In 2015, seven sub-activities under main activities will be continued as follows; Sea trial on reducing the energy use in trawlers – low energy consumption trawl net (LEC-trawl), Manual for fishing gear survey, Advanced Sustainable Technology: Underwater camera system for observing trawl net, FAO Energy Audit for Trawlers in the Gulf of Thailand, Study on Bycatch in Bottom Gillnet Fisheries along the coast of Rayong Province, Technical support to Department of Fisheries Thailand to formulate Fisheries Management Plan in Trat Province , and Development of database system for management of data from the cruise surveys.

2. List of Projects

1. Promotion of strengthening of SEAFDEC Visibility and Image
2. Tailor-made Training Programs
3. Improvement of Fisheries Technology and Reduction of the Impact from Fishing

TRAINING DEPARTMENT

1. Promotion on Strengthening of SEAFDEC Visibility and Image

The fishery information through SEAFDEC's roles and TD implementations activities was imparted to public via three national exhibitions. More than 89,000 audiences visited TD booths in totally. Three issues of Advance Fisheries Technology (AFT) Magazine under the themes of "Fishing Technology of Tuna", "Fisheries Resource Enhancement", and "Vessel Monitor System to combat IUU fishing" were produced respectively and disseminated to TD network by hard and soft copies. As for the management of information system, the project was carried out in collaboration with the Secretariat to develop a database system for managing overall SEAFDEC programs through developing electronic questionnaire survey on the existing human resources. Additionally, an information staff took a training course on Magazine Design for developing her skill for applying to information work.

2. Tailor-made Training Programs

More than 124 participants attended in six tailors-made training courses and study tour programs, based on the need and requirement from the partners. The programs were designed and planned out through the consultation and agreement between TD and training partners. This included the choice of subjects, duration, location, and the target participants to build up human capacity on the fisheries related fields.

3. Improvement of Fisheries Technology and Reduction of the Impact from Fishing

Eight sub-activities from three main activities as promotion of appropriate technologies and practices of fishing marine engineering, fisheries research, and database for deep-sea fisheries resource survey were conducted to transfer appropriate technologies and practices to support sustainable utilization of coastal and marine fisheries resources, including capture fishery, marine engineering, and fishery information, and strengthen collaboration with relevant agencies at national and regional levels.

PROJECT DOCUMENT

Program Categories: Departmental Programs

Project Title: Promotion on strengthening of SEAFDEC Visibility and Image

Responsible Department: Training Department

Total Duration: 2016

Funding Sources: Training Department

Estimated Budget for 2016: 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
- Tools and database of TD information system
- 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 management information system of the Training Department will be continued and developed as information data warehouse to meet internal and external requirement. Strengthening of TD information network such as an electronic mail group and integration of relevant website, *etc.* has been maintained as sub-activity.

Activity 4: Human capacity building for SEAFDEC information staffs

The knowledge, skill and experience of information staff will be enhanced and developed by relevant ICT training program with outside institutions such as strategy of Public Relation, website design, *etc.*

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2015

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 Agriculture Museum and Pomprachunlajomklao Naval Base was organized. More than 6,000 audiences visited TD's booth.	10 Jan 15	
- Exhibition at the annual national fisheries fair "Pramong Nomklao" was organized in collaboration with the Thai Department of Fisheries. TD presented fisheries activities under the theme of "IUU Fishing and Vessel Monitor System". With the distribution of various technical publications, brochures, and fishery-related souvenirs to the audience, the SEAFDEC visibility was promoted. More than 80,000 audience visited TD's booth.	26 Jun- 5 Jul 15	
- Exhibition at Burapha University was organized. TD presented fisheries activities under the theme of "Fishery Oceanographic Survey and Deep Sea Fisheries". Through the distribution of various technical publications, brochures, and fishery-related souvenirs, the promotion of SEAFDEC visibility was made to more than 3,000 audiences	18-20 Aug 15	
2) Production of Information Materials - Three issues of Advance Fisheries Technology in theme of "Fishing Technology of Tuna", "Fisheries Resource Enhancement", and "Vessel Monitor System to combat IUU fishing" were produced and distributed about 6,000 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, May, and Sep 15	
- A manual of "Safety at sea for fishing vessels" was produced in Thai version about 1,500 copies. The manual was distributed to fishermen, fishery officers and relevant stakeholders.	Jan 15	
3) Management Information System - TD in collaboration with Secretariat is developing database system for managing overall SEAFDEC Programs. The information collected includes detail of training course such as list of training courses, list of participants and download of training documents.	Jun-Dec 15	
- Initiation of the database on personal data record for SEAFDEC/TD and SEC staff.	Jan-Dec 15	

Project Activity Title	Duration	Remarks
- TD in collaboration with Secretariat is developing electronic questionnaire on the existing human resources in SEAFDEC Member Countries, aims to determine the existing human resources of fisheries department and other relevant institutions.	Aug-Dec 15	
- Development of integration website on "SEAFDEC symposium on strategy for fisheries resources enhancement in the region".	Jul 15	
4) Human capacity building for SEAFDEC information staff - An information staff attended a training course on Magazine Design with "Adobe Indesign CC 2015" to develop her skill and apply to her information work.	Oct 15	

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2016

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1: Promotion and Enhancement of SEAFDEC Visibility and Image National and international exhibitions as required will be organized to promote and enhance SEAFDEC role, visibility and image through present knowledge on fisheries information in collaboration with other SEAFDEC Departments.	Jan-Dec	
Activity 2: Production of Information Materials - Three issues of Advance Fisheries Technology (AFT). - Fisheries information package to promote awareness understanding for fishermen, stakeholder and public will be produced. The package will include books, brochures, CD-ROM, <i>etc.</i>	Jan-Dec	
Activity 3: Management Information System The management information system of the Training Department will be continued and developed as information data warehouse to meet internal and external requirement. Strengthening of TD information network such as an electronic mail group and integration of relevant website, <i>etc.</i> has been maintained as sub-activity.	Jan-Dec	
Activity 4: Human capacity building for SEAFDEC information staff The knowledge, skill and experience of information staff will be enhanced and developed by participating in relevant ICT training program with outside institution such as strategy of Public Relation, website design, <i>etc.</i>	Jan-Dec	

4.2 Expected Outcomes/Outputs

- Strengthening of SEAFDEC and Departments visibility and image
- Understanding on role and SEAFDEC Departments activities
- Delivery of fisheries information to stakeholder and public
- Tools and database of TD information system

PROJECT DOCUMENT

Program Categories: Departmental Programs
Project Title: Tailor-made Training programs
Responsible Department: Training Department
Total Duration: 1 year (2016)
Funding Sources: Training Department
Estimated Budget for 2016: -

1. INTRODUCTION

In each year, TD conducts 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 is 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 2015

3.1 Activities Achievements in the Year 2015

Achievements based on Activities	Duration	Remarks
1. Study Tour Visit for Marine Fisheries Association Members (Anchovy), Pangkor Island, Perak Malaysia to Thailand, there were 11 fishers and 2 officers from Malaysia participated in the program.	6 days (12-17 January 2015)	
2. Study Visit to Sectors Concern on Fisheries in Thailand (in collaboration with Kagoshima University). There were 5 University students and 1 University resource person participated in the program.	8 days (14-21 February 2015)	
3. The Short-term Training Course for University Students on Ecosystem Approach to Fisheries Management" (Batch-58). The training course was conducted at SEAFDEC/TD, there were 40 students from seven difference Universities attended in the training course.	11 days (2-12 June 2015)	
4. Training Course on Essential Ecosystem Approach to Fisheries Management Batch-1, the course was conducted in collaboration with Thai-DOF. There were 25 DOF-Thailand officers who work in the Southern part of Thailand participated in this training course; the course was conducted in Songkla province	6 days (22-27 June 2015)	
5. Training Course on Essential Ecosystem Approach to Fisheries Management Batch-2, the course was conducted in collaboration with Thai-DOF. There were 25 DOF-Thailand officers who work in the Central and Eastern parts of Thailand participated in this training course; the course was conducted in Rayong province	6 days (6-11 July 2015)	
6. A long-term training course on fishing operation for Tinsulanonda Fisheries College Students (located in Songkhla, Thailand). 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 industry of Thailand. There were 15 students attended on this training course for this batch.	4 months, from 30 September 2015 to 12 Feb. 2016.	

4. PROPOSED ACTIVITIES FOR THE YEAR 2016

At least three tailor-made training programs will be conducted in the year 2016. (The course titles, programs and activities will be designed based on the requirements/needs from the training partners).

4.1 Expected Outcomes/Outputs of the Year 2016

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 based 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: 2014-2017

Funding Sources: Department of Fisheries, Thailand, Research Institute of Humanity and Nature – RIHN, Japan, etc.

Estimated Budget for 2016:

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, National Agricultural Training Council – Malaysia, and Research Institute of Humanity and Nature – RIHN, Japan, SmartCatch Co Ltd) It also includes technical assistances, research and development, sea trials, and demonstrations. Project activities implementing since 2014 include:

- 1) Promotion of appropriate technologies and practices of fishing and marine engineering
 - a. Sea trial on reduction of energy use in trawlers – low energy consumption trawl net
 - b. Manual for fishing gear survey
 - c. Improvement for fish landing facilities of the fishing port
 - d. Advanced Sustainable Technology: Underwater camera system for observing trawl net
 - e. FAO Energy audit for trawlers in the Gulf of Thailand
- 2) Fisheries research on impact of fishing practice to marine ecosystem
 - a. Research on bottom sediment around set net area in Ban Phae, Rayong Province
 - b. Coastal Area Capability Enhancement in Southeast Asia: Study on Bycatch in Bottom Gillnet Fisheries along the Coast of Rayong Province, Thailand
- 3) Database for fisheries resources survey
 - a. Development of database system for management of data from the cruise surveys

2. PROJECT

2.1 Goal /Overall Objectives

- 1) 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; and
- 2) 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

1) Promotion of appropriate technologies and practices of fishing and marine engineering

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 trawl net 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, Advanced Sustainable Technology: Underwater camera system for observing trawl net “SmartCatch®” has been proposed and introduced to perform a limited scope study in partnership with SEAFDEC/TD to conduct field test and demonstrate the advantage of using underwater camera system, so-called CatchCam real-time video/lighting system as a sustainable productivity tool in Thai trawl fisheries. SEAFDEC/TD in collaboration with Department of Fisheries, Thailand has carried out the improvement of fishing port facilities in Rayong Province, eastern part of Gulf of Thailand.

There are 5 Sub-activities under this program as follows;

Sub-Activity 1: Sea trial on reducing of energy use in trawlers – low energy consumption trawl net (LEC-trawl)

Sub-Activity 2: FAO Energy Audit for trawlers in the Gulf of Thailand

Sub-Activity 3: Advanced Sustainable Technology: Underwater camera system for observing trawl net “SmartCatch®”

Sub-Activity 4: Manual for fishing gear survey

Sub-Activity 5: Improvement on fishing port facilities.

2) Fisheries research on impact of fishing practices to marine ecosystem

This program has been focused on impact of fishing practices to marine ecosystem. Activities have been jointly implemented by SEAFDEC, EMDEC (Eastern Marine Research and Development Center, Department of Fisheries Thailand, stationed in Rayong Province), 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;

Sub-Activity 1: Research on bottom sediment around set net area in Ban Phae, Rayong Province

Sub-Activity 2: Study on Bycatch in Bottom Gillnet Fisheries along the Coast of Rayong Province, Thailand

3) Database for fisheries resources survey

SEAFDEC Training department in collaboration with Deep Sea Fisheries Technology Research and Development Institute (DFTRDI), 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 and DFTRDI 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.

Sub-Activity 1: Development of database system for management of data from the cruise surveys

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2015

Project/Activity Title	Duration	Remarks
1. Sea trial on reducing of energy use in trawlers – low energy consumption trawl net (LEC-trawl)	Jan - Dec 2015	Data analysis is on-going
2. FAO Energy Audit for trawlers in the Gulf of Thailand	Jan - Jun 2015	Report is under verification
3. Advanced Sustainable Technology: Underwater camera system for observing trawl net SmartCatch®	Jan - Jun 2015	Communicate to improve the agreement between Smart Catch and SEAFDEC
4. Manual for fishing gear survey	Jan - Dec 2015	Manual format is under development and editing.
5. Improvement on fishing port facilities	Jun - Dec 2015	Improvement of fishing port is on-going

Project/Activity Title	Duration	Remarks
6. Research on bottom sediment around set net area in Ban Phae, Rayong Province	Jan - Dec 2015	Data collection completed, Analysis Process is on-going
7. Study on Bycatch in Bottom Gillnet Fisheries along the Coast of Rayong Province, Thailand	Apr - Dec 2015	Mid-year data collection, researchers are working on summarizing the update
8. Development of database system for management of data from the cruise surveys	Jan - Dec 2015	Verification of data collection system is on-going

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2016

4.1 Project Description/Framework

1) Promotion of appropriate technologies and practices of fishing and marine engineering

Series of activity have been focused on promotion on appropriate technology and practices of fishing and marine engineering. Activities on energy saving in fishing emphasized on trawl net 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, Advanced Sustainable Technology: Underwater camera system for observing trawl net SmartCatch® has proposed to perform a limited scope study in partnership with SEAFDEC/TD to conduct field test and demonstrate the advantage of using underwater camera system, so-called CatchCam real-time video/lighting system as a sustainable productivity tool in Thai trawl fisheries. In order to support the policy to reduce number fishers in marine fishing activities, an introduction of deck machineries to assist fishing operations, *e.g.* purse seiners, trawlers, gillnetters, and etc, will be surveyed and studied. A proposal of this study is under development. There are 5 Sub-activities under this program as follows;

Sub-Activity 1: Sea trial on reducing of energy use in trawlers – low energy consumption trawl net (LEC-trawl)

Sub-Activity 2: FAO Energy Audit for trawlers in the Gulf of Thailand

Sub-Activity 3: Advanced Sustainable Technology: Underwater camera system for observing trawl net “SmartCatch®”

Sub-Activity 4: Study on deck machinery for fisheries installed in Thai fishing vessels-

Sub-Activity 5: Improvement on fishing port facilities.

2) Fisheries research on impact of fishing practices to marine ecosystem

This program focuses on impact of fishing practices to marine ecosystem and formulation of Fisheries Management Plan in the Eastern Gulf of Thailand. Activities will be jointly implemented by SEAFDEC, EMDEC (Eastern Marine Research and Development Center, Department of Fisheries Thailand, stationed in Rayong Province), RIHN (Research Institute of Humanity and Nature, Japan), and Department of Marine Technology of Burapha University, aiming to monitor the change of bottom sediment around the set net area and monitoring discard in small-scale gillnet fisheries operating in the coastal area of Rayong Province.

In addition, to apply the concept of Ecosystem Approach to fisheries management, SEAFDEC will technically support EMDEC in formulation of planning.

There are 2 Sub-activities under this program as follows;

Sub-Activity 1: Study on Bycatch in Bottom Gillnet Fisheries along the Coast of Rayong Province, Thailand

This research study is on-going and will be updated as midterm progress report in April 2016.

Sub-Activity 2: Technical support to Department of Fisheries Thailand to formulate Fisheries Management Plan in Trat Province Developing Proposal

This activity will be initiated in 2016. A proposal of activity is under development.

3) Development of database system for management of data from the cruise surveys

SEAFDEC Training department (TD) in collaboration with Department of Fisheries, Thailand (DOF, Thailand) will continue onto developing database system for management of data from the cruise resource surveys. SEAFDEC/TD and DFTRDI of DOF Thailand, as well as verifying 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.

Sub-Activity 1: Development of database system for management of data from the cruise surveys

4.2 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1. FAO Energy Audit for Trawlers in the Gulf of Thailand	Jan-Dec 2016	Develop new project phase
2. Sea trial on reducing of energy use in trawlers – low energy consumption trawl net (LEC-trawl)	Jan-Dec 2016	Writing report
3. Study on deck machinery for fisheries installed in Thai fishing vessels	Apr-Dec 2016	Planning process
4. Advanced Sustainable Technology: Underwater camera system for observing trawl net SmartCatch® and Follow the update improvement remotely observation vehicle of SEAFDEC/TD	Jan-Dec 2016	Formulate the MOU between between Smart Catch and SEAFDEC
5. Improvement on fishing port facilities	Jan-Dec 2016	Ongoing project
6. Study on Bycatch in Bottom Gillnet Fisheries along the Coast of Rayong Province, Thailand	Jan-Dec 2016	Continue the data collection
7. Technical support to Department of Fisheries Thailand to formulate Fisheries Management Plan in Trat Province	Feb-Dec 2016	Planning process
8. Development of database system for management of data from the cruise surveys	Jan-Dec 2016	Verifying data collection method

4.3 Expected Outcomes/Outputs

1. Report of FAO energy audit for trawlers in the Gulf of Thailand
2. Report of the sea trial on reducing the energy use in trawlers – low energy consumption trawl net (LEC-trawl)
3. Memorandum of Understanding on the advanced sustainable technology: underwater camera system for observing trawl net
4. Progress report on Improvement on fishing port facilities.
5. Report on deck machinery for fisheries installed in Thai fishing vessels
6. Study on discard and trash in bottom gillnet fisheries along the coast of Rayong Province
7. Report and Plan of formulation on the Fisheries Management Plan in Trat Province
8. Progress report of the database system from the cruise surveys and improvement plan

OTHER PROGRAMS

Project Title	Lead Department	Period	Appendix No.
Coastal Area Capability Enhancements in Southeast Asia (SEAFDEC/RIHN Collaborative Project)	TD	2012-2016	1
Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region (SEAFDEC/ACIAR Collaborative Project)	SEC/TD	2015-2016	2
Technical Exchange between Thailand and Myanmar Fisheries Scientists (FAO/BOBLME-SEAFDEC Collaborative Project)	SEC	2015	3

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: 2012010201
Program Categories:	Other Program		
Project Title:	Coastal Area Capability Enhancements in Southeast Asia (SEAFDEC/RIHN Collaborative Project)		
Lead Department:	Training Department	Total Duration:	2013-2017
Donor/Sponsor:	RIHN (Research Institute for Humanity and Nature, Japan)	Total Donor Budget:	USD 304,700
Project Partner:	(Japanese Institutes, Fac. of Fisheries-Kasetsart Univ., EMDEC-DOF-Thailand)	Budget for 2016:	USD 14,300 (Proposed)
Project leader:	(Nopporn M./Project Coordinator)	Involved Country	The Philippines, Thailand and Japan

1. INTRODUCTION/BACKGROUND

The coastal areas of Southeast Asia contain great biodiversity, where livelihoods of the people of Southeast Asia directly and indirectly depend on this biodiversity. However, there are some difficulty to achieve harmonization between sustainable development of fishery community and coastal conservation, as their complex linkage between natural resources and ecosystem services and utilizations. Hereby the Research Institute for Humanity and Nature (RIHN) and some Japanese Universities and research institutes would like to start a cooperative research project named “Coastal capability enhancement in Southeast Asia” in corporation with the Southeast Asian Fisheries Development Center (SEAFDEC), Eastern Marine Fisheries Research and Development Center (EMDEC) of Department of Fisheries, Thailand, Faculty of Fisheries of Kasetsart University, Thailand, the University of Philippines Visayas, Aklan State University and other related institutions/organizations. In this project “holistic approach” will be adopted to give a full understanding how people utilizes the coastal resources, for the purpose to establish the rational and practical measures both for social and ecological sustainability. Based on the holistic data and information, we try to create new development concept named “Area Capability” that can show us how the ecosystem health can be harmonized with the welfare of the people. Through this project, we expect several inventories of ecosystem services and livelihoods of coastal area to complete the guideline of new research approach using the concept on Area Capability.

Target Sites

3 Main Sites:

Panay Is.-the Philippines
Rayong Prov./Prachuab Kiri Khan Prov.– Thailand and,
Ishigaki Is.-Japan

3 Sub Sites:

Guimaras Is.-the Philippines
Trang, Surat Tani Prov.- Thailand and,
Mikawa Bay-Japan

Participating Organizations/Institutions:

- **Regional Institute**

- Southeast Asian Fisheries Development Center (SEAFDEC-Training Department , Samut Prakan, Thailand and Aquaculture Department-the Philippines)

- **Japanese Institutes**
 - Research Institute for Humanity and Nature (RIHN)
 - The University of Tokyo (Graduate School of Agricultural and Life Sciences, Atmosphere and Ocean Research Institute, Institute for Advanced Studies on Asia)
 - Tokyo Univ. Marine Science and Technology (TUMSAT)
 - School of Marine Science and Technology, Tokai University
 - School of contemporary sociology, Chukyo University
 - Kyoto University (Center of Southeast Asian Studies, Graduate School of Science, Kyoto University, Graduate School of Agriculture)
 - National Fisheries University
 - Kagoshima University (Faculty of Fisheries, The Kagoshima University Museum)
 - National research institute of fisheries science, Fisheries Research Agency of Japan

- **Thailand Institutes**
 - Faculty of Fisheries, Kasetsart University, Bangkok
 - Eastern Marine Fisheries Research and Development Center-EMDEC, Department of Fisheries of Thailand, Rayong Prov.

- **Philippines' Institutes**
 - University of Philippines of Visayas
 - Aklan State University

2. PROJECT

2.1 Goal/Overall Objectives

The coastal area, consisting of the eco-tone between land and the sea, naturally provides a wide range of habitat for flora and fauna. It has one of the richest biodiversity and the highest primary productivity on the earth. Its ecosystem is also characterized with the complexity and vulnerability. Fluctuation of water flows such as river water discharge, tidal flow and sea current easily affects the food chains and material flows of the ecosystem, causing irreversible shift of ecosystem in some cases. In Southeast Asia, coastal areas are characterized by the close linkage between ecosystem and local people. The coastal area is the basis of the livelihood of local people, and human intervention is deeply embedded in ecosystem. This linkage enhances the complexity and affects the vulnerability of the ecosystem in the region.

2.2 Expected Outcomes and Outputs:

- 1) Inventory database and reference books on coastal fishery in Southeast Asia
- 2) Inventory database and taxonomic field guide books of coastal resources in Southeast Asia and Population structure map of major marine fisheries target species in Southeast Asia
- 3) Research protocol guideline and reference books on ecosystem health for coastal area
- 4) Research protocol guideline and reference books on social aspects for coastal area
- 5) Acoustic survey methodology and analysis system for coastal area
- 6) Guideline of community based Set-net fishery installation and utilization for coastal management
- 7) Guideline of community based restocking activities for co-managements of coastal resources
- 8) Establishment of "Area Capability Approach" and its guidelines, through the human networks among SEAFDEC Member Countries

2.3 Project Description/Framework

Component 1: Capture Capability survey for coastal fisheries

Activity 1: Standardization of Capture Capability survey and compilation of data
Share the experiences for Capture Capability survey for standardizing the data format and analysis methods. And assemble existing data and information of Capture Capability.

Activity 2: Fishing gear/boat and target species survey

Data and information on Capture Capability including fishing gears and boats including size, materials, structure, operation, fishing ground, initial and operational cost, average daily catch amount and species compositions etc., are collected through observation and interview survey at fishing sites. Data and information are installed into data base which can be accessed through web site. The field survey of Capture Capability will be conducted at target sites.

Activity 3: Publication of the field guides of Capture Capability of coastal fisheries

Inventory books of fishing gears/boat and operations of Southeast Asian coastal area will be published with photos and illustrations.

Component 2: Biological resource survey**Activity 1:** Standardization of Taxonomic and DNA analyses

Several participating researchers will be invited to Japan for several weeks to exchange ideas and experiences and standardize methodologies of taxonomy and DNA studies. And the visiting researchers discuss about joint research activities and publications of outcomes among members.

Activity 2: Specimen collection for biological resource analysis

Biological Specimen will be collected in target sites. Size, Location, Species name of specimens will be recorded and tissue specimen for DNA analyses will be preserved (the tissue specimen will be also used for Material and Stable Isotope analyses). Specimens will be stored in accordance with the standardized methods. Taxonomic and DNA analyses will be conducted at RIHN and collaborative institutes. All data and analyses results will be installed into the data base.

Activity 3: Publication of the field guide books of biological resources

Inventory database and reference books on biological resources in Southeast Asian Coastal area will be published with photos and illustration.

Component 3: Environment assessments and ecosystem health survey**Activity 1:** Standardization of environment assessments and ecosystem health analyses

Several participating researchers will be invited to Japan for several weeks to exchange ideas and experiences and standardize methodologies of material flow analyses including stable isotope analyses and biomass surveys. And the visiting researchers discuss about joint research activities and publications of outcomes among members.

Activity 2: Specimen collection for material flow analyses and biomass surveys

Specimen for material flow analysis and biomass survey will be collected in target sites. Specimens will be preserved in accordance with the standardized methods. Data and information of specimen will be installed into the database. Material flow analyses and biomass estimation analyses will be conducted at RIHN and collaborative institutes.

Activity 3: Publication of the Research Protocol guideline on ecosystem health

Research Protocol guideline on ecosystem health of coastal area will be published including material flow, chemical and stable isotope analyses and biomass evaluations.

Component 4: Human capability survey for Coastal Area**Activity 1:** Standardization of Human capability survey for Coastal Area

Several participating researchers will be invited to Japan for several weeks to exchange ideas and experiences and standardize methodologies of social and human capability surveys. And the visiting researchers discuss about joint research activities and publications of outcomes among members.

Activity 2: Household and Social survey

Household data including member list, Job history, Sex, Age, Education, incomes, properties, health conditions, hopes, and participation to social activities, experiences of migration, religion and ethno-linguistic groups are collected through interview and questioner scurvies. Inter-industrial structures are examined based on the data and survey. Regulation, registration and other official administrative affairs are examined. All data and information will be installed into database. Approximate 100 households' data will be collected at each area.

Activity 3: Publication of the research protocol guideline on social aspects and inventory books on coastal livelihood and society

Research Protocol guideline on social aspects of coastal area including interview and questioner surveys and analyses will be published. And inventory books of social and livelihoods in Southeast Asian Coastal area will be published with photos and illustration.

Component 5: Development of acoustic survey equipments and systems for shallow waters

Activity 1: Developing the new data collection equipments and analysis systems of acoustic survey at coastal area

Acoustic data collection system including equipment modification will be conducted for coastal area survey. And analysis methodology is also developed.

Activity 2: Field test of the developed equipments and system

Newly developed equipments and systems will be tested at field.

Activity 3: On-site-Training of new acoustic survey equipments and systems

The operation of the new acoustic survey equipments and systems will be demonstrated around set-net area. And the analysis of the data is also shown to expected users.

Activity 4: Publication of the research protocol guideline of acoustic survey for coastal area

Operation manual and guide books of acoustic survey in coastal area will be published.

Component 6: Community-based Set-net introduction for coastal management and HRD

Activity 1: Support of the set-net installation and operation

Technical support of installation of set-net at coastal area will be provided from experts.

Activity 2: Impact evaluation of set-net fishery on environment and livelihood

Species and size compositions of the fish catch of set-net and other fishery are examined based on the log book, statistics and observation data. And the biodiversity aspects of target species will be examined by DNA and material analyses. Water quality and material flow condition around set-net will be examined. Information of fishing grounds and operation time of the fishery conducted around set-net will be collected for impact evaluation. Income and time allocation data and information of villagers who live around set-net are analyzed to clarify the linkage among set-net installation and livelihood changes.

Activity 3: Publication of the Set-net installation manual and management guide book

Set-net installation manual and management guide books will be published.

Component 7: Community-based fishery resource rehabilitation for coastal management and rural development (Based and implemented in the Philippines*)

Activity 1: Technical support of the hatchery works

Technical supports to establish and to manage local hatchery activities will be conducted from experts.

Activity 2: Conduct stock enhancement works with local institutions

Release works of larvae and/or fly of important species in Batan Bay in the Philippines

Activity 3: Impact evaluation of rehabilitation on environment and livelihood

Environment of coastal area around rehabilitation sites including water and material flows, species diversity and biomass will be examined using the scientific analyses. And data and information of fishy catch, incomes of the fishermen, social capital, linkages among sectors, job opportunity, time allocation, food safety and health condition of fishermen will be gathered to evaluate impact from rehabilitation activity

Activity 4: Publication of the local hatchery management and rehabilitation activities for local development

Manual and guide books of the small scale community based hatchery activities and its management are published.

Component 8: Database construction, Workshops and Wrap-up Activities

Activity 1: Developing the new database system

Integrated database will be established. Main server is installed at RIHN. Mirror servers will be installed at local areas.

Activity 2: Workshops and Seminar of Area Capability Approach

Workshops and Seminar will be held for exchange data, information, experiences, ideas, and results of this study.

Activity 3: International Symposium of Area Capability Approach

International symposium for Area Capability Approach for coastal development will be held.

Activity 4: Area Capability Guidebook Publication

Area Capability Approach guide book will be published based on the collaborative research results.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2015

3.1 Activities Achievements in the Year 2015

The over-all activities of standardization of methods on existing data collection, monthly field surveys and tests, equipments and system development and all data collection on environment are in progress at the present.

The first 4 years of the project implementation emphasized on the preliminary surveys to examine the present status of the resources, biology, livelihoods, social activities, environment that would contribute to the future evaluation of the area capability in the coastal areas which uses the set-net as a core of the project activity.

Physical conditions such as wind, current and oceanographic parameters are key factors for catch-ability and performance of the set-net and other fishing activities. A series of preliminary surveys have been repeatedly made, monitored and followed-up periodically. However, since the fishing season for set net is limited for only 7 months (Oct-April), therefore, periodical monitor and follow up surveys on the fishing activities and oceanography are considered incomplete for the whole year and must be fulfilled. While for the land surveys (social, livelihoods and fish sampling) are in progress.

Some survey results were disseminated in the public by means of oral and poster presentations through annual RIHN Seminar for the first, second and third year of the project implementation.

The SEAFDEC Publication: Fish for the People, Volume 13 No. 1: 2015. The Area Capability Study in SE Asian region especially in the Eastern Gulf of Thailand focusing on the Rayong Set-net is one of the interesting issues as originally prepared by Dr. Ishikawa S. and the team, entitled "Balancing Fishery Resource Utilization and Conservation for Environmental Sustainability and Socio-economic Stability". This article appears on pages 13-20. (It's available for download on the SEAFDEC's website: <http://www.seafdec.org/publications/>)

Summary of all activities and findings would be reported in the 4th RIHN Project Seminar held in November 2015, in Kyoto, Japan.

Project/Activity Title	Duration	Remarks
Component 1: Fishing Capability survey	April 2015-March 2016	Data analysis/Compilation and Publication
Component 2: Biological Survey	April 2015-March 2016	Field survey and Data analysis/Compilation and Publication
Component 3: Environmental Survey	April 2015-March 2016	Field survey and Data analysis/Compilation and Publication

Project/Activity Title	Duration	Remarks
Component 4: Social and Livelihoods Survey	April 2015-March 2016	Field survey and Data analysis/Compilation and Publication
Component 5: Acoustic Survey	April 2015-March 2016	Compilation and Publication
Component 6: Set-net Impact Evaluation	April 2015-March 2016	Compilation and Publication
Component 7: Re-stocking Impact Evaluation	April 2015-March 2016	Compilation and Publication
Component 8: Workshop and Meeting	April 2015-March 2016	Database Development/ Meeting, Workshop, Seminar, Study tour/Compilation and Publication

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2016

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Component 1: Fishing Capability survey	April 2016-March 2017	Data analysis/Compilation and Publication
Component 2: Biological Survey	April 2016-March 2017	Data analysis/ Compilation and Publication
Component 3: Environmental Survey	April 2016-March 2017	Data analysis/ Compilation and Publication
Component 4: Social and Livelihoods Survey	April 2016-March 2017	Data analysis/ Compilation and Publication
Component 5: Acoustic Survey	April 2016-March 2017	Compilation and Publication
Component 6: Set-net Impact Evaluation	April 2016-March 2017	Compilation and Publication
Component 7: Re-stocking Impact Evaluation	April 2016-March 2017	Compilation and Publication
Component 8: Workshop and Meeting	April 2016-March 2017	Database Development/ Meeting, Workshop, Seminar, Study tour/Compilation and Publication

4.2 Expected Outcomes/Outputs

- 1) Inventory database and reference books on coastal fishery in Southeast Asia
- 2) Inventory database and taxonomic field guide books of coastal resources in Southeast Asia and Population structure map of major marine fisheries target species in Southeast Asia
- 3) Research protocol guideline and reference books on ecosystem health for coastal area
- 4) Research protocol guideline and reference books on social aspects for coastal area
- 5) Acoustic survey methodology and analysis system for coastal area
- 6) Guideline of community based Set-net fishery installation and utilization for coastal management
- 7) Guideline of community based restocking activities for co-managements of coastal resources
- 8) Establishment of “Area Capability Approach” and its guidelines, through the human networks among SEAFDEC Member Countries

PROJECT DOCUMENT

Project id: 2015060201			
Program Category:	Other Program		
Project Title:	Application of Fish Passage Design Principles to Enhance Sustainability of Inland Fishery Resources in the Southeast Asian Region (ACIAR supported Project)		
Lead Department:	TD and Secretariat	Total Duration:	May 2015 – Sep 2016
Donor/Sponsor:	ACIAR	Total Donor Budget:	AUD 150,000
Project Partner:	DOF Thailand	Budget for 2016:	~ AUD 100,000
Project leader:	Chumnarn Pongsri	Involved Country	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 fishways, 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.

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 2015

3.1 Activities Achievements in the Year 2015

Project/Activity Title	Duration	Remarks
<p>Preparatory works prior to the main project activities were undertaken as follows:</p> <ul style="list-style-type: none"> • Informal Group Discussion for Preparation of the Project. The discussion was participated in by key project staff of SEAFDEC and the DOF Thailand to discuss on key factors to be considered in designing model of fishway, and came up with suggestion on initial model design and research plan to be undertaken under the project. 	8-10 May 2015, Nakhon Nayok, Thailand	

Project/Activity Title	Duration	Remarks
<ul style="list-style-type: none"> • Development of initial model of experimental fishway. Initial model of small-size fishway was constructed at the Training Department, with initial trials on hydrological aspect and applicability for migration of some fish species. Results from this preparatory activity would serve as a basis for further discussion during the Expert Workshop. 	Aug-Nov 2015	
<p>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.</p>	January 2016	
<p>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.</p>	Jan-Mar 2016	
<p>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.</p>	Apr-Aug 2016	

3.2 Expected Outcomes/Outputs

This project seeks to design a laboratory fishway which, upon completion, will provide scientists, engineers and students opportunity to perform focused experiments on fishway design with a small number of key species under controlled conditions, and hydraulic modeling to understand critical design parameters. Based on the laboratory fishway model, detailed experiments with a range of different fishway designs and fish species could be performed. It is anticipated that this project would come up with fishway designs that could be practical and applicable for the Southeast Asian specificity, and contribute to sustainability of inland fishery resources for countries in the Southeast Asian region.

PROJECT DOCUMENT

ACHIEVEMENTS FOR YEAR 2015
AND PROPOSED ACTIVITY FOR YEAR 2016

			Project id: 20015060202
Program Categories:	Other Program		
Project Title:	Technical Exchange between Thailand and Myanmar Fisheries Scientists		
Lead Department:	Secretariat	Total Duration:	2015
Donor/Sponsor:	FAO/BOBLME & SEAFDEC	Total Donor Budget:	~USD20,000
Project Partner:	FAO/BOBLME, DOF-Myanmar and DOF-Thailand	Budget for 2016:	-
Project coordinator:	Ms. Sawitree Chamsai	Involved Country	Myanmar & Thailand

1. INTRODUCTION/BACKGROUND

Hilsa (*Tenualosa ilisha*) is an important fish in Bangladesh, India and Myanmar, and its distribution stretches into Thailand where it is most common in the Andaman Sea area, and east as far as Malaysia, Indonesia and Viet Nam. Hilsa is one of the focus species of the Bay of Bengal Large Marine Ecosystem (BOBLME) Project and the Project Work plan for 2014, includes a range of activities relating to it; including: stock assessments, meeting of the Hilsa Working Group, and national activities for the improvement of data and knowledge *e.g.* on life history parameters, stock structure, genetics, morphometrics, interaction of different fisheries sub-sectors, critical habitats for life-history stages.

At a recent meeting of the Myanmar Minister for Fisheries and Livestock and the Secretary-General of SEAFDEC it was agreed that SEAFDEC would facilitate a technical exchange between Thailand and Myanmar fisheries scientists in order to develop capacity of Myanmar scientists, and to improve the understand of the biology and life history stages of hilsa.

In a subsequent meeting of the BOBLME Project Regional Coordinator and the Secretary General of SEAFDEC, the Regional Coordinator agreed that BOBLME project could provide financial support to get this initiative started.

The technical exchange will include sending fisheries scientists from SEAFDEC and the Department of Fisheries Thailand to Myanmar, to work with Myanmar counterparts undertaking field work to investigate the biology and life cycle of hilsa. At a later date, Myanmar scientists will visit Thailand research facilities to continue the work.

2. PROJECT (January – June 2015)

2.1 Goal/Overall Objectives

This technical exchange aims to enhance knowledge on biology of hilsa and transportation technique of live fish of Myanmar scientists as well as better the lives of the coastal populations through improved regional management of the Bay of Bengal environment and its fisheries.

2.2 Expected Outcomes and Outputs:

Outcomes:

- 1) Improved understanding of the biology and life-history of hilsa in Myanmar waters
- 2) Strengthened collaboration and communication between Thailand and Myanmar fisheries scientists
- 3) Improved understanding of the biosecurity issues associated with transboundary movements of fish

Output:

A report on the results of the technical exchange between Thailand and Myanmar fisheries scientists, including an assessment of the biosecurity issues associated with the movements of fish, and the results from the rearing of the fry.

2.3 Project Description/Framework

Activity 1: Technical Exchange: Thai Scientist to Myanmar (including pre-survey in Myanmar)

The DOF Thailand dispatches a team to conduct a survey at study areas and tests on collection of hilsa. The team also checks the facilities of two hatchery and nursing centers as well as observes catch landing from two fishing grounds from local buyers and interviews middlemen and fishers at two landing sites.

Activity 2: Collection of Hilsa Juveniles

Three types of fishing gear/method were used to collect hilsa juveniles and transport to a hatchery. Hands-on training for the collection and transportation of hilsa for Myanmar staff has been carried out.

Activity 3: Transportation of Juveniles to Thailand, and conduct of experiments on juvenile rearing etc.

Exportation and importation clearance for hilsa to Thailand had been done before a pack of specimen would be shipped to Thailand. Biosecurity concerns along the process of transportation of hilsa to Thailand are actively implemented.

Activity 4: Technical exchange: Myanmar scientists to Thailand

Scientists from Myanmar visited Thailand to observe handling techniques for live fish especially Indo-pacific Mackerel and facilities at the Samutsakhon Coastal Fisheries Research and Development Center where hilsa will be kept once transported from Myanmar to Thailand. The Myanmar scientists also observed the collection of *moina* and other zooplankton using paddlewheel in a pond.

3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2015

3.1 Activities Achievements in the Year 2015

Through the conduct of hands-on operations, the knowledge and experience of scientists from Myanmar and Thailand had been shared at desirable level. The Myanmar scientists enhanced their knowledge on the biology of hilsa as well as improvement of their skills on the collection and transportation techniques of live fish especially pelagic species. As envisioned, they could now plan for modified techniques to suit their available resources and facilities. They have also become aware of the importance of their role in the conservation of the resources, and with their technical knowledge on aquaculture, they would be able to start activities that would lead to the development of a whole system of hilsa production and conservation.

Project/Activity Title	Duration	Remarks
Activity 1: Technical exchange: Thai Scientist to Myanmar (including Pre-survey in Myanmar) The DOF Thailand dispatched three scientists to Myanmar to conduct a survey at study areas and tests on collection of hilsa. The team also checked the facilities of two hatchery and nursing centers as well as observed catch landing from two fishing grounds from local buyers and interviews middlemen and fishers at two landing sites.	1-6 March 2015	
Activity 4: Technical Exchange, Myanmar Scientists To Thailand After arriving Bangkok, the scientists from Myanmar were briefed at the SEAFDEC Secretariat on the program and activities during their visit. The second day, A demonstration of collecting live Indo-Pacific Mackerel from the set-net fishing in Ban Laem, Petchburi province.	11-15 May 2015	

Project/Activity Title	Duration	Remarks
<p>Activity 2: Collection of Hilsa Juveniles Three types of fishing gear/method which are bamboo stake trap and net, floating net, and beach seine were used to collect hilsa juveniles and transport to a hatchery. Hands-on training for the collection and transportation of hilsa for Myanmar staff had been carried out.</p>	5-10 June 2015	
<p>Activity 3: Transportation of Juveniles to Thailand Exportation and importation clearance for hilsa to Thailand had been done before a pack of specimen would be shipped to Thailand. Biosecurity concerns along the process of transportation of hilsa to Thailand are actively implemented.</p>	11 June 2015	

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2016

SEAFDEC developed a proposal to conduct the next phase of activities. The draft would be sent to DOF Myanmar for consideration and that the DOF Myanmar could make use for exploring financial and technical support from potential donors.

Annex 8

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

Project Title	Lead Department	Appendix No.
Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand (UNEP/GEF/SEAFDEC/SCS)	TD/SEC	1

CONCEPT NOTE OF ESTABLISHMENT AND OPERATION OF A REGIONAL SYSTEM OF FISHERIES *REFUGIA* IN THE SOUTH CHINA SEA AND GULF OF THAILAND

Project Title: Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand

Prospect Funding Agency: UNEP/GEF

Lead Department: Training Department

Proposed Budget: USD 3,000,000

Duration: 2015 -2019

1. BACKGROUND/INTRODUCTION

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 characterised 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. These include the use of destructive fishing gear and practices, such as the operation of demersal trawls and push nets in seagrass areas, and the detonation of explosives and release of fish poisons in coral reef areas. Small-scale inshore fishing pressure has therefore been identified as a significant cause of the degradation and loss of coastal habitats in the South China Sea.

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. It is executed regionally by the Southeast Asian Fisheries Development Center in partnership with the government agencies responsible for fisheries in the 6 participating countries as Cambodia, Indonesia, Malaysia, Philippines, Thailand and Viet Nam.

2. GOAL/OVERALL OBJECTIVES

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 the 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.

3. PROJECT DESCRIPTION

The project is comprised of the following 4 project components:

Component 1 will result in the establishment of operational management at 14 priority fisheries *refugia*, with community-based *refugia* management plans being key outputs. Supporting activities include

consultative processes to facilitate agreement among stakeholders on the boundaries of fisheries *refugia*, identification of key threats to *refugia* sites, recording of fishing community views regarding appropriate fisheries and habitat management measures, and eliciting stakeholder inputs to management plan review. *Refugia* management plans will provide rules *inter alia* on operating requirements for the use of particular classes of fishing vessels or fishing gear within *refugia*, procedures for adjusting management measures over time, and mechanisms for enforcement. Specific direction is given to drafting of regulations and ordinances required in support of plan implementation.

Component 2 focuses on strengthening the enabling environment for the formal designation and operational management of *refugia*. Preparatory activities include legal reviews to identify, *inter alia*: legal terminology for describing *refugia*; formal procedures for demarcating boundaries of spatial management areas such as *refugia*, including requirements for assessing the socio-economic impacts of management measures and stakeholder consultation; and provisions for decentralising *refugia* management to the community level via development of co-management and rights-based approaches. These national reviews are aimed at informing the drafting of required policy and legislative amendments for adoption by competent authorities. This component will also build the national and site-level science and information base required to inform the monitoring and evaluation of the effectiveness of individual *refugia* and the regional network of sites.

Component 3 focuses on strengthening information management and dissemination aimed at enhancing the national uptake of best practices in integrating fisheries management and biodiversity conservation, and in improving community acceptance of area based approaches to fisheries and coastal environmental management. Supporting activities involve the development of national knowledge management systems on the use of fisheries *refugia* in capture fisheries management, and the establishment of a Regional Education and Awareness Centre that will operate as a facility for the production and sharing of information and education materials on fisheries and critical habitat linkages in the South China Sea. Importantly, Component 3 will support the development of indicators to monitor the effectiveness of coastal fisheries management systems established for priority fisheries *refugia*. A regional programme for the compilation of standardised fisheries statistics for use in identifying and managing fisheries *refugia* will also be developed to support longer-term management.

Component 4, At the national-level, Component 4 will strengthen cross-sectorial coordination for integrated fisheries and environmental management and will harness the national scientific and technical expertise and knowledge required to inform the policy, legal and institutional reforms for fisheries *refugia* management in the participating countries. Local community action and strengthened ‘community to cabinet’ linkages will be facilitated via establishment and operation of site-based management boards for fisheries *refugia* at the 14 priority locations in the South China Sea. Regionally, Component 4 will foster regional cooperation in: the establishment and operation of a regional system of fisheries *refugia*; and in the integration of scientific knowledge and research outputs with management and policy making. This component also includes project coordination and management activities aimed at: ensuring the timely and cost effective implementation of regional and national-level activities; and satisfying the reporting requirements of UNEP and the GEF.

4. EXPECTED OUTPUTS/OUTCOMES

Related end of project targets are:

- By 2018, 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 2018, 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.

5. PROGRESS AND STATUS

Proposed project document was submitted to UNEP/GEP for CEO Endorsement.

STATEMENT

*By Dr. Cherdasak Virapat
Network of Aquaculture Centres in Asia-Pacific (NACA)*

The Chairperson,
Distinguished Delegates at the 38th Meeting of the SEAFDEC Programme Committee,
Delegates from Regional and International Organizations,
Ladies and Gentlemen,
Greeting from Network of Aquaculture Centres in Asia-Pacific.

On behalf of the Network of Aquaculture Centres in Asia-Pacific I would like to express my sincere gratitude to SEAFDEC for inviting NACA to participate at the 38th Meeting of the SEAFDEC Programme Committee. Due to prior commitment, I will not be available to attend the Meeting.

I would like to inform you concerning areas of focus by NACA and common interest which have been promoted and implemented in the Asia-Pacific region. This is to enhance future collaboration and cooperation between NACA and SEAFDEC.

The NACA development objectives are to increase production of fish for human consumption by mean of sustainable aquaculture practices, improve rural income and employment; diversity rural farm production; and enhance foreign exchange earning and saving through coordination action programmes implemented by a network of regional and national centres and associated institutions and bodies in 19 countries in Asia Pacific region, namely: Australia, Bangladesh, Cambodia, China, Hong Kong, India, Indonesia, Islamic Republic of Iran, Democratic People Republic of Korea, Lao People Democratic Republic, Malaysia, Maldives, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Viet Nam. These serve as platforms for the implementation of activities in the region. NACA implements its mission by means of capacity bulding through education and training; collaborative research and development through network among centres and people; development of information systems and communicaton networks; policy guidelines and support to policies and institutional capacities; aquatic animal health and disease management; gender, genetics, biodiversity and governance.

NACA will seek collaboration with SEAFDEC in pursuing such common interest, development projects, organizations of forums, workshop, meetings, and various technical training course in the near future as follows:

1. NACA Regional Lead Centre in the Philippines

At the 12th Session of the Technical Advisory Committee of NACA held recently during 10-12 March 2015 at the Regent Hotel in Cha-Am. Petchaburi, Thailand, NACA had discussed with Director of the NACA Regional LEAD Centre in the Philippines reactivating collaboration through the establishment of an MoU between NACA and SEAFDEC Aquaculture Department, Iloilo, Philippines in particular areas of training and education, information sharing and exchange and aquaculture development in areas of the farming of fishes, crustaceans, mollusks and seaweeds for food, livelihoods, equity, and sustainable development, as well as aquaculture feed development, etc. The SEAFDEC Aquaculture Department, Iloilo, Philippines will also consider putting up signage of it's NACA Regional Lead Centre status at the Department. A draft MoU between NACA and SEAFDEC/AQD was recently sent to SEAFDEC/AQD for consideration since 27 July 2015.

2. Capacity building programme in Aquaculture Governance

NACA will develop a syllabus of its capacity building programme in Aquaculture Governance for the Asia-Pacific Regiona and will collaborate with its partners including SEAFDEC to implement such a training programme starting in 2016. The Training programme will provide a holistic picture of aquaculture governance including institutional structures, policy and decision making process and rules related to aquaculture that determine how aquaculture policies, laws and regulations are exercised, how actions are implemented at different levels, and how aquaculture communities have decided for aquaculture development and management. The target groups will be about 20-25 middle level

management from NACA/SEAFDEC Member Countries with equal geographical distributions and gender equity.

3. 11th Asian Fisheries and Aquaculture Forum and Celebration of the Silver Jubilee of NACA from 3 to 7 August 2016, Bangkok International Trade and Exhibition Centre (BITEC) in Bangkok, Thailand

The Asian Fisheries Society (AFS) and NACA will be organizing the 11th Asian Fisheries and Aquaculture Forum & Seafood Exhibition jointly with the ASEAN Fisheries and Aquaculture Conference and Seafood Exposition in collaboration with Thailand's Department of Fisheries and SEAFDEC from 3 to 7 August 2016 at the Bangkok International Trade and Exhibition Centre in Bangkok, Thailand. In addition, NACA will take this opportunity to celebrate its Silver Jubilee Anniversary on 3rd August 2016 at the NACA Headquarters, Suraswadi Building, Kasetsart University Campus in Bangkok, Thailand. The 11th AFAF will address important and emerging global, regional and national issues on fisheries and aquaculture in the Asia-Pacific region through organization of technical session for better fisheries and aquaculture governance and management, within a sustainable development framework and increasing awareness of the need for maintaining environmental integrity.

I hope that NACA and SEAFDEC will find opportunities to strengthen their collaboration and coordination on these important activities related to aquaculture development in the near future.

Thank you.

MONITORING AND EVALUATION OF SEAFDEC PROGRAMS FOR 2015 AND ONWARDS

Executive Summary

Refers to the 32nd Meeting of the Program Committee (32PCM) recommended that a monitoring and evaluation system should be established to assess the outputs and outcomes of the programs and their contributions to the sustainable development of fisheries in the region. The 34PCM also urged SEAFDEC to consider re-arranging the existing individual projects having the same goals or with similar outcomes which should be grouped together into thematic programs in order to facilitate funding from other sources/organizations. In addition, SEAFDEC was also asked to group some activities which are of common interest to Member Countries, such as tuna fisheries, IUU fishing, among others, in a special report so that clearer picture of the actual situation could be easily understood. In order to avoid confusion and to achieve clarity, the PCM could be restructured in such a way that reporting of activities is grouped based on the program thrusts of SEAFDEC. Moreover, as the 45th Meeting of the Council (45CM) expressed the concern on the lack of overall strategy for activities conducted by SEAFDEC and linkages among the SEAFDEC programs should be clarified, so that the programs could be implemented in a more coherent and strategic manner. Secretariat examined one of the main causes that make difficulty to evaluate the results after implementation is that most of SEAFDEC program in the past are activity-based project in which it is quite difficult to align the achievements/results with the objectives and/or goals. Secretariat also finds difficulty to evaluate for the cost benefit of each project/program due to many criteria information and data are not recorded.

Taking into accounts the recommendations and suggestions by SEAFDEC program committee and council directors as above mentioned, the Secretariat proposed a new format of project documents as well as the template of project evaluation that were developed based on the Results-Based Management (RBM) approaches at the 37PCM for consideration and comments. The project document (Appendix 1) and evaluation sheet (Appendix 2) were later endorsed by the 37PCM by mail as a referendum to be used in 2015 and onwards.

For long-term effective management, Secretariat as a center to manage overall SEAFDEC Programs therefore develops the SEAFDEC Program Database System as a tool for managing SEAFDEC Programs with the support from SEAFDEC/TD Database Developer. The system is developed based on the new project template while include several tools for generating the results that users required. The database system is a closed online system for SEAFDEC administrator and project leader to access using an authorized user name and password. It is expected that after trails for 1-2 years (2015-2016), all SEAFDEC Departments responsible for SEAFDEC program/projects will be requested to input all details of the project documents and submit to Secretariat via this system online.

REQUIRED CONSIDERATION BY THE MEETING

The Program Committee is requested to take note the improvement for monitoring and evaluation of SEAFDEC Programs and development of the program database system as a tool for effective management. The Program Committee is also invited to provide advice or suggestion to SEAFDEC for further improvement for effective monitoring and evaluation taking into accounts the highest benefit from project results to the region and country in the future.

**PROJECT DOCUMENT
ACHIEVEMENTS FOR YEAR 2015
AND
PROPOSED ACTIVITY FOR YEAR 2016**

			Project id: YYYAABBXX
Program Categories:	Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title:	<i>Project Titles</i>		
Program Thrust:	<i>Program Thrust No.</i>	Total Duration¹:	<i>2013 - 2017</i>
Lead Department:	<i>Department Name</i>	Lead Country:	<i>Thailand</i>
Donor/Sponsor:	<i>Name</i>	Total Donor Budget:	<i>USD XXXXXX</i>
Project Partner:	<i>None</i>	Budget for 2016:	<i>USD XXXX</i>
Project leader:	<i>Name</i>	<i>Involved Country</i>	

PART I: OVERALL PROJECT DESCRIPTION

1. Brief Project Description (300 words max)

This could be an executive summary thus it should be specific and concise, without going into the detailed aspects of the document since these are further clarified at the later part. The overview should include: the problem statement; the project's objectives; implementing organizations; key project activities; and the expected outputs of the project.

2. Background and Justification

This part included the problem analysis, baseline data and information (describe the underlying causes of the problem and the present situation), regionality, participation and beneficiaries. Include any related and relevant ASEAN-SEAFDEC Resolution, policies and plans of action

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:	Output 1:	Activity 1:
Objective 2:	Outcome 2:	Output 2:	Activity 2: Activity 3: (if any)
		Output 3: (If any)	Activity 4:

¹ For an example of 5 years project starting from 2013-2017, but in case of new project then the starting year should be from 2015.

3.2 Overall Scope/Description of Project

Activity	Description
Activity 1	
Activity 2	
.....	
Activity 4	

3.3 Activity, Sub-activity and Proposed Budget for 2013-2017) (in case of 5 year project from 2013)

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1:	Sub-activity 1.1	xxxx	xxxx	xxxx	xxxx	xxxx
	Sub-activity 1.2	xxxx	xxxx	xxxx	xxxx	xxxx
Activity 2:	Sub-activity 2.1:	xxxx	xxxx	xxxx	xxxx	xxxx
Activity 3	Sub-activity 3.1:	xxxx	xxxx	xxxx	xxxx	xxxx
.....	Sub-Total Budget	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx

PART II: ACHIEVEMENT OF 2015 PROJECT IMPLEMENTATION

1. Achievements of the Project Implementation for the present year <2015>

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

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					
Activity 2					
Sub-activity 2.1					
Sub-activity 2.2 (if any)					
Activity 3					
Sub-activity 3.1					
Sub-activity 3.2 (if any)					
Activity 4					
Sub-activity 4.1					
Sub-activity 4.2 (if any)					

3. Achievements and Expected Outcome/Outputs of the Activity

Planned activity	Expected outcome/output	Achievements
Activity 1		
Sub-activity 1.1		
Sub-activity 1.2		
Activity 2		
Sub-activity 2.1		
Sub-activity 2.2 (if any)		
Activity 3		
Sub-activity 3.1		
Sub-activity 3.2 (if any)		
Activity 4		
Sub-activity 4.1		
Sub-activity 4.2 (if any)		

4. List of Completed Publications and Others (e.g. technical report, VDO, presentation file, etc.)

List of completed publications for the year 2015	Type of media	Attached e-file

5. Evaluation from Participants of Member Countries for WS and Training Course (if available)

Planned activity	Evaluation/ Views from Participants
Activity 1	
Sub-activity 1.1	
Sub-activity 1.2	
Activity 2	
Sub-activity 2.1	
Sub-activity 2.2 (if any)	
Activity 3	
Sub-activity 3.1	
Sub-activity 3.2 (if any)	

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.

PART III: PROPOSED ACTIVITIES FOR YEAR 2016

1. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2016

(Unit: USD)

Proposed Activity	Description of Proposed Activity	Proposed Budget
Activity 1		
Sub-activity 1.1		
Sub-activity 1.2		
Activity 2		
Sub-activity 2.1		
Sub-activity 2.2 (if any)		
Activity 3		
Sub-activity 3.1		
Sub-activity 3.2 (if any)		
Activity 4		
Sub-activity 4.1		
Sub-activity 4.2 (if any)		

2. Expected Outcomes/Outputs of Activity for the Year 2016

Proposed Activity	Expected Outcomes/Outputs of Activity
Activity 1	
Sub-activity 1.1	
Sub-activity 1.2	
Activity 2	
Sub-activity 2.1	
Sub-activity 2.2 (if any)	
Activity 3	
Sub-activity 3.1	
Sub-activity 3.2 (if any)	
Activity 4	
Sub-activity 4.1	
Sub-activity 4.2 (if any)	

3. Schedule of Activity for the Year 2016

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												
Sub-activity 2.2 (if any)												
Activity 3												
Sub-activity 3.1												
Sub-activity 3.2 (if any)												
Activity 4												
Sub-activity 4.1												
Sub-activity 4.2 (if any)												

Project id.

YYYYAABBXX				
YYYY: Started Year	AA: 01 = TD 02 = MFRD 03 = AQD 04 = MFRDMD 05 = IFRDMD 06 = SEC	BB: 01 = FCG/ASSP 02 = Other	XX: Running number of project	Remarks:

Type of activity*

<p>*There are 5 types of activity (R, T, I, P, and O) as follows;</p> <p>I. Research and Development activities: Conduct of technical/scientific research, fact-finding activities, Generation/verification of technologies that could be used by target users (e.g. fishers, farmers, processors).</p> <p>II. Training activities:</p> <p>III. Information activities: activities that aim to enhance collection of fisheries data and information, and improve visibility of SEAFDEC (e.g. production of publications, tool kits, SOP, information materials, conduct of exhibitions, etc.)</p> <p>IV. Policy development activities: Activities that aim to develop fisheries policies, e.g. expert consultation, regional consultations, development of regional guidelines, policy frameworks, etc., including desk studies on policy issues</p> <p>V. Collaborative Program: such as SEAFDEC Research Vessels and others</p> <p>VI. Others: Activities related to project administration; communication; project planning, monitoring and evaluation (including project review meeting); staff capacity building, including participation of project staff to non-SEAFDEC events, etc.</p> <p><i>(some activities may fall into more than one category, but Departments should specify which category the activity would fit best).</i></p>

PROJECT EVALUATION FORM

				Project id: YYYAABBXX
Program Categories:				
Project Title:				
Total Duration:		Program Thrust:		
Components			Priority	
Priority Issues				
Country involved				
Lead Department:		Lead Country:		
Donor/Sponsor:	JTF	Project leader:		
Total Proposed Budget:		Budget spent as of (year):		

PART I: Report of Actual Result of Activities and Invested Budget/Manpower by Project Leader/Secretariat**1. Result of Activities and Invested Budget/Manpower**

Planned-activity	Expected outcome/output	Achievement	Spent Budget	Invested manpower
Activity 1				
<i>Sub-Activity 1.1</i>				
<i>Sub-Activity 1.2</i>				
<i>Sub-Activity 1.3</i>				
Activity 2				
<i>Sub-Activity 2.1</i>				
<i>Sub-Activity 2.2</i>				
<i>Sub-Activity 2.3</i>				

2. Actual Outcome/Output

Objective	Expected Outcomes	Expected Outputs	Actual Outcomes	Actual Outputs
Objective 1	Outcome 1:	Output 1:		
	Outcome 2:	Output 2:		
Objective 2	Outcome 1:	Output 1:		
	Outcome 2:	Output 2:		

3. Remarks on implementation of the project

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PART II: Evaluation by SEAFDEC Member Countries

1. Evaluation sheet

	Criteria	Score✕	Comments
Effectiveness: How is the effectiveness of project activities?			
1	Project activities are able to meet the desires and needs of target beneficiaries/Priority issues of the region?		
2	Objectives/outcomes could be achieved or are likely to be achieved		
3	How much of satisfaction to the achievement by the project		
4	How much of validity of outputs/publications		
Efficiency: How is the efficiency of project activities?			
5	Objectives/outcomes are achieved in the project period		
6	Project activities are implemented within allocated budget		
7	Project activities are implemented within appropriate manpower		
Total Score			

✕Scores should be given in a scale from 0 to 5, where 5 means enough satisfaction, while 0 means dissatisfaction. The total perfect score for all the criteria should be 35.

Total Score: ≥ 30 objectives and target have been achieved;
 18-29 fairly achieved;
 6-17 partially achieved;
 ≤ 5 not achieved

2. Additional Input on the Following Aspects:

<p>1. Relevance (<i>Objectives of the project are still valid with respect to the current situation</i>)</p> <p>2. Impact (<i>Positive and negative changes obtained the project's interventions, directly or indirectly, intended or unintended, where the positive and negative impacts of external factors, such as changes in political will, donor funding support and others, are taken into account</i>).</p> <p>3. Sustainability (<i>Benefits of the project could be sustained after project ends and funding ceases</i>)</p> <p>4. Others</p>
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**REVIEWS OF THE IMPLEMENTATION OF
THE 2011 ASEAN-SEAFDEC RESOLUTION AND PLAN OF ACTION ON
SUSTAINABLE FISHERIES FOR FOOD SECURITY FOR THE ASEAN REGION
BY THE ASEAN MEMBER COUNTRIES (2011-2014)**

The “Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020” were prepared by the ASEAN-SEAFDEC Member Countries in collaboration with ASEAN and SEAFDEC and were adopted by the Ministers and Senior Officials responsible for fisheries of the ASEAN-SEAFDEC Member Countries during the Ministerial and Senior Official Meetings of the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 “Fish for the People 2020: Adaptation to a Changing Environment” held during 13-17 June 2011 in Bangkok, Thailand. The Resolution and Plan of Action are envisaged to serve as policy framework and priority actions to support sustainable development of fisheries and enhancing the contribution from fisheries to food security and better livelihood of people in the region towards the coming decade.

On the occasion of 5-year implementation of the 2011 ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 in 2015, SEAFDEC Secretariat as a coordinating body of the SEAFDEC would propose to review the progress and results of programs implementation based on the 2011 ASEAN-SEAFDEC Resolution and Plan of Action, and the priority issues to be addressed in ensuring sustainable fisheries development and enhancing the contribution of fisheries to food security in the Southeast Asian region. This is also to ensure that the implementing programs and activities are in line with the Resolution and Plan of Action and maintained in the track towards 2020.

To monitor the progress of the programs and activities, SEAFDEC Secretariat has prepared a survey questionnaire and sent to all SEAFDEC Member Countries which would seek cooperation and contribution to the said purposes.

The followings are the feedback of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 contributed from the SEAFDEC Member Countries (as of July 2015):

1. Brunei Darussalam
2. Malaysia
3. Myanmar
4. Philippines
5. Thailand
6. Viet Nam

5-year Implementation of the 2011 ASEAN-SEAFDEC RES⁸ & POA⁹ on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020

Contents

- I. Preparation of this document
- II. Priority issues in implementing the 2011-RES & POA
- III. Conclusion and way forward

I. PREPARATION OF THIS DOCUMENT

1. This document presents the results of programs and activities that have been implemented in the Southeast Asian region based on the *2011 Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020* (2011-RES&POA), and compiled by the SEAFDEC Secretariat using a survey questionnaire. Based on inputs from the Member Countries, the priority issues, concerns and activities for implementing 2011-RES&POA are consolidated in this document. Details of information from the Member Countries are shown in **Appendix 1**.

2. Based on information from the countries, their activities had been rearranged where appropriate. This document is therefore meant to provide better understanding on the priority issues addressed by the countries for ensuring sustainable fisheries development and enhancing the contribution of fisheries to food security in the Southeast Asian region. It is also envisaged that this document will be used as a regional reference for the Member Countries. In this regard, the Member Countries are kindly requested to review and provide comments/amendments for improvement of this document. For clarification and questions with regards to the results indicated in this document, please kindly contact worawit@seafdec.org.

II. PRIORITY ISSUES IN IMPLEMENTING THE 2011-RES&POA

2.1 RESOLUTION

3. In Brunei Darussalam and Malaysia, noticeable progress has been gained in various activities related to managing fishing capacity through a number of approaches, such as limiting the number of fishing licenses, establishing fishing zones, strengthening enforcement of fishery regulations, promoting responsible fishing gear and practices, and improving fisheries information collection systems. This has been attained through HRD and research programs to support better management of the fisheries, and enhance competitiveness in fish trade through improvement of food safety standards.

4. As reported, some countries have experienced varying degrees of success. In Malaysia for example, the National Plan of Action on Sustainable Fisheries for Food Security Towards 2020 has been developed which is currently being implemented. In Brunei Darussalam, fishery and habitat management programs/activities are well developed and integrated based on the results of the national research survey of fishery/habitat resources. Public awareness programs on such activities were also launched as form of national campaign in Brunei Darussalam to promote the reduced use of destructive fishing gear and practices in the country.

PLAN OF ACTION – PLANNING AND INFORMATION

5. Currently, a number of activities related to enhancing the fisheries resources have been implemented in Philippines through habitat protection. Various human resources capacity building programs were conducted by targeting the fisheries officers at the Department of Fisheries Malaysia to effectively gather fisheries-related information. In Viet Nam, the Master Plan of Fisheries Development (so-called Vision 2030) was approved and being implemented until the year 2020. To enhance sharing of

⁸ RES – Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020: <http://www.seafdec.org/download/resolution-and-plan-of-action-2011/>

⁹ POA – Plan of Action: A. Planning and Information; B. Fisheries Management; C. Aquaculture; D. Optimal Utilization of Fish and Fishery Products; E. Fish Trade; and F. Regional and International Policy Formulation

such information, Officials of the Directorate of Fisheries of Viet Nam has been participating in relevant international and regional workshops.

2.2 PLAN OF ACTION – FISHERIES MANAGEMENT

6. In the Philippines, many fisheries resource management plans were developed where activities are implemented through consultation and engagement of key stakeholders, such as the management plans for tuna, sardines, and blue swimming crabs. In the case of Viet Nam, the national guidelines for commercial fisheries management had been successfully developed.

7. Using the ecosystem approach to manage fisheries, a number of national frameworks and plans of action had been developed in some countries and currently implemented through resources survey, stakeholders' consultations and knowledge sharing programs. For example, results from resources survey had been used as basis for developing the management plan for habitat and fisheries resources in Myanmar. In Malaysia, the National EAFM Steering Committee and EAFM Technical Committee were established for the development of national EAFM framework and its plan of action. Tuna fisheries management plan in Viet Nam was drafted by integrating the ecosystem approach.

8. To ensure that climate change responses are integrated into fisheries policy framework, a variety of activities related to promotion of co-management have been undertaken in some countries including the Philippines. In addition, the capacity of fisheries communities and fisheries related organizations has been built in the Philippines to adopt alternative livelihoods that adapt to climate change in support to achieving sustainable development.

9. To enhance and promote participation of local communities, the Department of Fisheries Malaysia successfully established "Fishery Volunteer Community Program" with over 5000 members throughout the country. In the Philippines and Thailand, formulation of fisheries management policies always involved various stakeholders and achieved through support activities by research.

10. In the Philippines, a number of small fishing boats use sails and supplemental fuel such as biofuel/gas as means of promoting the use of alternative energy source for fishing boats.

11. To enhance appropriate employment practice in accordance with domestic laws and regulations, the Philippines is now being compliance of Labor Laws in employment of fishers.

12. A survey on non-traditional fishing grounds was conducted in Philippine waters to obtain information and knowledge on improving/finding potential fisheries resources that could be used for developing necessary guidelines and enhancing the capacity of relevant authorities and communities to collaboratively resolve conflicts with other stakeholders.

2.3 PLAN OF ACTION – MARINE FISHERIES

13. The NPOA-IUU Fishing is one of the major activities that have been formulated by a number of countries in the region, including Brunei Darussalam, Malaysia, Viet Nam, and Thailand. Moreover, Malaysia published the national guidelines on fishing licensing, boat registration, and port state measures to facilitate the implementation of the NPOA-IUU Fishing.

14. In many countries, such as Malaysia, Philippines, Thailand, and Viet Nam, there has been a significant increase in the conduct of research on the impact of various fishing gear types and methods on the marine ecosystem. For example, a research on reduction of by-catch in trawl net was carried out in Malaysia, and studies on the impacts of various fishing gears and lights were conducted in the Philippines. In Viet Nam, trials on the use of circle hooks in line fishing to minimize the incidental catch of sea turtles was carried out. In some countries, such as Philippines, by-catch reduction program with its relevant fisheries management measures have been implemented and enforced.

15. One of main activities under resource enhancement program is the deployment of artificial reefs, which is being conducted in some countries in the region including Malaysia and Thailand. Study on the possible impacts of fish aggregating devices had been carried out in Philippines.

16. To ensure the inclusion of fisheries objectives in management plans of future MPAs and promote the adoption of the *refugia* concept in line with the ASEAN-SEAFDEC Regional Guidelines on the Use of Fisheries *Refugia* in Capture Fisheries Management, the Philippines has been exploring the possibility of applying the fishery *refugia* concept as means of increasing productivity of fishing grounds. In Malaysia, improvement of its national coordination and management of fish stock and critical habitats has been undertaken. Furthermore, Malaysia challenges to improve the sustainability of fish stocks through habitats management.

17. With regards to strengthening the efforts to address safety at sea, Viet Nam issued Decree No. 66/2005 to ensure the safety of fishers onboard and fishing vessels operating at sea. In the Philippines, monitoring of the working conditions of fishers onboard has been carried out. At the same time, providing safety materials and promoting appropriate boat design are also being sustained for the safety of fishers onboard as well as the vessels at sea.

18. A number of countries including Malaysia, Myanmar, and Viet Nam fully recognize the need to establish fishery policies and legal frameworks for inland fisheries management using the ecosystem approach. In Malaysia, the Fisheries Regulation and National Plan for Integrated Lake and Reservoir Management has been established. A number of scientific information and research activities have been conducted in Viet Nam for the development of management plan for inland fisheries, such as the study on environment-friendly fishing gears for inland, alternative livelihoods (tourism) to reduce the impacts of capture fisheries on the resources and environment.

19. In Malaysia, school children, village communities and working committees are being made aware of the importance of freshwater fisheries for food security, through a number of national activities on restocking of depleted fish stocks, conservation and reintroduction of endangered species, and improvement of fishing opportunities. As means of maintaining the natural fish stocks, Thailand has been implementing various fisheries resources restocking programs.

20. Indigenous freshwater fish sanctuaries and protected areas have been established in Malaysia with the specific objective of promoting coordinated planning on the use of inland waters. Community-based management system (so-called Tagal system practiced by Sabahan local traditional fishers in Sabah waters of Malaysia) was established to enhance inland fishery resources. Moreover, Malaysia developed national water resource policy and management measures through a wide range of stakeholders' consultation processes. In Viet Nam, the technology to enhance inland fisheries has been improved in close coordination with other relevant sectors such as rice farming and water resources management. A study on fishing capacity in inland fisheries was conducted in Viet Nam for the development of a co-management model.

2.4 PLAN OF ACTION – AQUACULTURE

21. Malaysia addresses social, economic, and environmental aspects of sustainable aquaculture through the development and implementation of national policies to transform and restructure freshwater aquaculture system, rearrange aquaculture activities for SMEs, encourage the involvement of young agropreneurs, promote good aquaculture practices, and enhance mobile marketing of agriculture products. Myanmar devolves co-management to the local authorities and stakeholders through the national project on sustainable development and mangrove friendly small-scale aquaculture and fisheries aimed at building the capacity of communities for co-managing fisheries and aquaculture systems within the mangrove ecosystem. The Philippines initiated a national program on mariculture development for fisherfolk, providing infrastructures, equipment and technical support.

22. Replanting of mangroves in the Philippines had been implemented through rehabilitation program, in the priority areas including abandoned, underdeveloped and underutilized fishponds. The activities were implemented under Fish Pond Lease Agreements where the key biodiversity areas were identified by Department of Environment and Natural Resources. In addition to that of promoting environment-friendly aquaculture, the Philippines implemented a number of programs/activities for establishment of aquaculture livelihoods, including community-based multi-species hatcheries, organic aquaculture, organic farming protocols known as the Philippine National Standard on Organic Aquaculture, and seaweeds development at national level.

23. With regards to the development and implementation of the ASEAN guidelines for environment-friendly and responsible aquaculture and good aquaculture practices, various activities to build the capacities of human resources (fish farmers) were carried out in Brunei Darussalam fulfilling the minimum requirements in biosecurity, and in Malaysia for promoting responsible aquaculture. A number of farms complying with Good Aquaculture Practices had increased in Malaysia and Thailand. Monitoring program on the use of drugs and others is being carried out in Malaysia to ensure the safety of food for consumption, and improvement of the quality of aquaculture products.

24. Malaysia established its aquaculture industrial zoning to increase production and create additional employment. In addition, knowledge of fisheries officers of Malaysia on new techniques has been improved through its national training program on management of freshwater aquaculture for rural area development. This aims to support the integration of aquaculture into rural development activities. In Myanmar, the number of small-scale fish farmers had increased through its national project on small-scale aquaculture extension for promotion of livelihood of rural communities (4-year project from 2009-2012). The results showed that the livelihoods of farmers in 5 townships had been improved, and the capacity of DOF local staff working in the project areas had been enhanced.

25. With regards to the implementation of measures and strategies at national level to monitor/regulate aquaculture operations, a number of countries (Brunei Darussalam, Malaysia, Thailand, and Viet Nam) have developed and implemented national programs of activities related to management of aquaculture operations. In Brunei Darussalam, several R&D activities were carried out to develop and increase aquaculture production within the context of environmental friendly concept. In Malaysia, environmental impact assessment has been conducted and reported, initiating a national regular monitoring program for aquaculture development. Moreover, Malaysia provides technical advice to fish farmers on aquaculture site selection, fish handling, and diseases and culture management through the establishment of E-Aquaculture. The capacity of Thai farmers has been enhanced on breeding and other aspects in response to the needs of farmers, resulting in increased aquaculture production. In Viet Nam, the capacity of fish farmers has been enhanced in the aspect of fisheries products improvement to meet the requirements of the importers.

26. To provide support for R&D in improving the existing genetic resources, Nucleus Broodstock Center and Broodstock Multiplying Center have been established in Malaysia, resulting in the improvement of the genetic characteristics of red tilapia. Regarding the production and distribution of specific pathogen-free (SPF) and quality seeds being promoted in Malaysia, SPF *Macrobrachium rosenbergii* has been produced, domesticated and improved. In Brunei Darussalam, good quality seeds have been produced to supply industries. Moreover, fish husbandry practices were introduced through a model-farming project for promoting fish cage culture operations in Brunei Darussalam.

27. In Malaysia, quality broodstocks have been provided and introduced to local farmers through training programs on broodstock management, for them to apply the concept of aquatic biosecurity, especially the small-scale hatchery operators and farmers. In addition, a number of farmers have adopted the appropriate technology for their hatcheries.

28. To encourage good employment practices in accordance with domestic laws and regulation, Malaysia established the guidelines on occupational safety and health “Act 1994” based on results of survey on safety conducted at workplaces.

29. Malaysia established the national committee on risk assessment and importation of alien species since 2011 to reduce negative environmental impacts in accordance with the Regional Guidelines on the Responsible Movement of Live Aquatic Animals and Plants. The Malaysian Quarantine and Inspection Services was also established covering 52 entry points around the country for monitoring the transfer of aquatic organisms.

30. In Malaysia, a national mechanism and several programs were established and developed to continue the efforts of controlling serious disease outbreaks, including the establishment of fish disease mechanism for surveillance and notification.

31. The following activities were implemented in some countries to enhance their capabilities in the diagnosis and control of fish diseases:

Brunei Darussalam

- Periodic surveillance program for diseases in aquaculture farms
- Establishment of diseases early warning system

Malaysia

- Capacity building program of the National Fish Health Lab
- Capacity building program for farmers, extension staff, and state biosecurity staff
- Proficiency testing on aquatic animal diseases
- Establishment of Reference Lab for timely access to disease control experts in the region

Thailand

- Establishment of trade agreement to conduct disease surveillance program for raw products from bivalves, shrimp, and fish

32. With regards to raising awareness of new diseases that may pose risks, Malaysia makes sure to immediately report any occurrences of diseases. In Viet Nam, there is an ongoing project on environmental monitoring for aquaculture on fish diseases implemented from 2015 until 2020.

33. To support the development of suitable alternative protein sources that will reduce the dependence on fishmeal, Malaysia has conducted R&D to find suitable alternative protein sources to replace fishmeal by focusing on locally-available ingredients.

34. To enable the aquaculture sector to mitigate and adopt better to the impacts of climate change, Malaysia developed the national policy on climate change in 2010, and conducted several R&D activities on climate change, for example, assessment of the effects of climate change on aquaculture, water quality, and aquaculture production. Malaysia also plans to develop inshore and offshore aquaculture management plan.

2.5 OPTIMAL UTILIZATION OF FISH AND FISHERY PRODUCTS

35. In order to support the development/application of technologies to optimize the utilization of catches and reduce onboard and onshore post-harvest losses, capacity building programs have been implemented in Brunei Darussalam, Malaysia, Philippines, and Thailand, focusing on seafood processing technology, fish handling, food safety and standards of fisheries products. A research activity for value-added marine products was conducted in Thailand. In Philippines, a comprehensive plan on post-harvest and ancillary industries has been developed and implemented.

36. To promote traditional fish products, the Philippines provides technical assistance program including training on food safety and safety requirements (GMP/SSOP/HACCP and HALAL Certifications), and information campaign by disseminating IEC materials.

37. Malaysia and Philippines have established the national traceability system with mechanism to certify or validate information for the supply chain of fishery products in line with international standards. In Malaysia, such systems include traceability system for ornamental and food fish; traceability system for all supply chain (since 2011); E-Biosecurity system for fish (since 2012); and E-Permit for live fish movement at the entry/exist point (since 2013). As for monitoring and implementing its national program on traceability, the Philippines implement traceability system and enforcement scheme in various production stages of the whole supply chain of fish and fishery products.

38. With regards to promoting the system for quality and safety of fish and fishery products, National Reference Lab was established in Malaysia for fish health inspection. In order to support the competitive position of ASEAN fish products in the world market, six (6) laboratories in Malaysia were accredited with ISO/IEC17025. In Thailand, focus was given to inspection and certification of fishery products for standard and monitoring from farm to table including certification for quality of marine products for export. Facilities and services of laboratories in the Philippines have been upgraded for implementing risk-based inspection and recognition scheme to test those laboratories.

39. To encourage relevant control agencies in applying appropriate legislation and coordinated activities regarding handling, processing, quality and safety of seafood, distribution, etc., Malaysia established Market Access Group Meeting consisting of Central Competent Authority and other competent authorities on fish and fisheries products. In the Philippines, Codes of practice on proper handling, processing, storage, and distribution of fish and fishery products were developed and implemented. In addition, mandatory accreditation of cold storage warehouse and assurance of fish/fishery products for safety and quality have been developed.

40. Philippines delivered capacity building programs and technology transfer to BFAR regional offices, industries, and other stakeholders on post-harvest technologies, GMP, SSPO/HACCP and HALAL Certifications. These were aimed at upgrading the technical skills and competencies of personnel in the public and private sectors on fisheries post-harvest technology and food safety management systems.

41. Malaysia developed and implemented Good Aquaculture Practice Guidelines and Hygiene Onboard Guidelines for handling and transportation, and hygiene. Furthermore, harmonization of Malaysia's GAP Guidelines with that of the ASEAN was conducted. In the Philippines, standard and guidelines for fish handling, transport of fishery and aquaculture products were formulated and established.

PLAN OF ACTION – FISH TRADE

42. To increase the competitiveness of its fishery products in regional and international markets, Malaysia has established and implemented the following activities:

- Promoting the ASEAN-GAP Standard
- Controlling transportation of live finfish (since 2010) in accordance with WTO notification of import requirements for live fish
- Controlling movement of live fish (since 2011) in accordance with the guidelines on responsible movement of live food finfish
- Controlling the use of chemicals in aquaculture (since 2014) in accordance with the guidelines on the use of chemicals in aquaculture
- Branding of fish and fishery products including HALAL foods

43. On the activities related to strengthening the cooperation among Member Countries of SEAFDEC to work towards common understanding on positions reflected in international fish trade fora, Malaysia has been actively participating in and providing inputs to various relevant meetings (ASWGFi, CITES, CODEC, FTA, RCEP-SWGSPS, SEAFDEC, etc.).

44. With regards to the implementation of appropriate international, capacity of officials of Department of Fisheries Malaysia has been built for biotoxin analysis.

45. To strengthen risk assessment and R&D related to the use of GMO products in fisheries and aquaculture, including food safety issues, Malaysia presented, discussed and shared information on the use of GMO products in fisheries and aquaculture at the GMO Meeting under arrangement by the Department of Biosafety – Ministry of Natural Resources and Environment Malaysia.

PLAN OF ACTION – REGIONAL AND INTERNATIONAL POLICY FORMULATION

46. Brunei Darussalam has developed national fishery policy based on relevant regional management policy frameworks. Malaysia participated in various international fora to reflect the country's position on relevant issues.

III. CONCLUSION AND WAYS FORWARD

47. A number of programs and activities had been implemented in the Member Countries in line with the 2011-RES&POA since its adoption in 2011. It can be said that the 2011-RES&POA is effective in addressing a range of programs/activities that the countries aimed to tackle. Based on the information from

the countries, it seemed that the most priority area is on “management” of marine and inland fisheries, followed by aquaculture. More involvement and interactions among key stakeholders to formulate/develop national policies and frameworks were also observed.

48. A summary of major findings based on inputs from the countries is as follows:
- Brunei Darussalam, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam actively participated in reviewing the programs/activities implemented in line with 2011-RES&POA;
 - Malaysia accomplishes the development of 2020 NPOA on Sustainable Fisheries for Food Security while the other countries also implemented a number of relevant programs/activities in line with the 2011-RES&POA;
 - Malaysia, Myanmar, Philippines, and Viet Nam increase their efforts in promoting the involvement of key stakeholders in the process of developing/formulating/ implementing specific fishery management plans;
 - Ecosystem approach for fisheries management is one of the key aspects that have been adopted for the development of national policies and frameworks;
 - Various capacities of local communities and fisheries-related organizations have been built and prepared for adopting alternative livelihoods that adapt to climate change in support to achieving sustainable development;
 - Fisheries resource surveys are being used as source of information for management planning, while fish restocking program is still a conventional way of enhancing fisheries resources;
 - Efforts of the countries in monitoring and regulating the development of aquaculture are within the context of environment-friendly concept; and
 - Efforts have been made by the countries in promoting traditional fish and fishery products to be more competitive in the world market in compliance with international standards.
49. It is possible that still a lot more relevant activities are not being reported in this document due to limited information provided and the period for information compilation. In this connection, the countries are kindly requested to provide inputs and information regarding the implementation of the 2011-RES&POA in the next 5 years.

**NATIONAL ACTIVITIES OF THE MEMBER COUNTRIES IN IMPLEMENTING
ASEAN-SEAFDEC RESOLUTION AND PLAN OF ACTION FOR FOOD SECURITY
TOWARDS 2020**

RESOLUTION

Resolution	Activities
<p>RES#1 Sustain the supply of fish and fishery products from the ASEAN region to improve food security, facilitate poverty alleviation, and improve the livelihoods of ASEAN people dependent on the harvesting, farming and marketing of fish and fishery products, by enhancing the necessary national fisheries policy, legal and institutional frameworks that encourages and support small-scale fisheries/farmers, including providing alternative livelihood opportunities.</p> <p>RES#10 Strengthen knowledge/science-based development and management of fisheries through enhancing national capacity in the collection and sharing of fisheries data and information.</p>	<p>Brunei Darussalam - Fisheries resource and habitat survey:</p> <ul style="list-style-type: none"> - Moratorium of fishing and zonation established - Marine protected area established - Fishery and habitat management programs developed/revised based on data collected through a survey using the MV SEAFDEC2
<p>RES#5 Further develop regional initiatives to promote a responsible fisheries management mechanism, taking into account the specific social, economic, cultural, ecological and institutional contexts and diversity of ASEAN and ASEAN fisheries in the spirit of development of the ASEAN Economic Community and the ASEAN Socio-Cultural Community</p> <p>RES#7 Promote better management of fishing capacity and use of responsible fishing technologies and practices, recognizing the movement towards replacing the “open access” to fisheries resources with “limited access: through rights-based fisheries, and at the same time, secure the rights and well-being of inland and coastal fisheries communities.</p> <p>RES#8 Foster cooperation among ASEAN Member Countries and with international and regional organizations in combating IUU-fishing</p>	<p>Brunei Darussalam - Promotion of CCRF:</p> <ul style="list-style-type: none"> - Enforcement of: square mesh size regulation for cod-end of trawl net, subsequently, capacity of enforcement officers built on investigation and arresting procedures in accordance with Fisheries Order 2009 and collaboration with other enforcement agencies established - Legal framework on MPAs updated and strengthened - Public awareness has risen through roadshows and awareness campaign resulting in gradual phasing out of unethical methods of fishing and use of destructive fishing gear <p>Brunei Darussalam - Issues related to fishing zonation:</p> <ul style="list-style-type: none"> - Freezing trawl fishing licenses for demersal trawlers fishing in zone 2 through moratorium on the issuance of new licenses (since 2000) - Limiting entry/access to fishing zone of all fishing operations in Brunei waters by: i) prohibiting commercial in all forms to fish in zone 1 area or near shore (3 nm from shoreline); and ii) allowing full time small-scale fishers to fish in zone 1 - Fishing gear license quota by zone adopted - 500 m safety zone in area of oil structure enforced in compliance to Merchant Shipping Act 2009 - Safety at sea for fishers from dangers encountered at nearby oil structures improved - Registration of all fishing boats with the Marine Department was made compulsory
<p>RES#10 Strengthen knowledge/science-based development and management of fisheries through enhancing national capacity in the collection and sharing of fisheries data and information.</p>	<p>Brunei Darussalam</p> <ul style="list-style-type: none"> - User-friendly fishery database developed - Human resources capacity built on data collection and analysis - Publication of fisheries statistics improved

Resolution	Activities
<p>RES#14 Promote inter-agency coordination of multiple uses of freshwater resources for sustainable development of the resources and conservation of freshwater habitats</p> <p>(related to Inland Fisheries Management)</p>	<p>Brunei Darussalam</p> <ul style="list-style-type: none"> - Study on population status of freshwater prawn conducted - Study on socio-economic for prawn fisheries conducted for future management for prawn fisheries
<p>RES#18 Promote joint ASEAN Approaches and positions in international trade in fish and fishery products indigenous to the region by harmonizing the standards, criteria and guidelines and developing mutually-recognized agreements on sustainability and safety management system.</p> <p>RES#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</p> <p>RES#20 Optimize the utilization of catch from water to market by reducing post-harvest losses and waste to increase fish support and improve economic returns through promotion of appropriate technologies and facilities along the supply chain</p> <p>RES#21 Improve technologies and facilities to ensure fish quality assurance and safety management systems, taking into account the importance of traditional fishery products as an alternative livelihood for fisheries communities.</p>	<p>Brunei Darussalam</p> <ul style="list-style-type: none"> - Guidelines on good manufacturing practices and HACCP in all seafood processing plants adopted - Certification program endorsed by National Standard Centre, Ministry of Industry and Primary Resources - Opportunity for market at global level increased - Safety seafood measures adopted - Processing plants certified for HACCP - Brunei Halal Brand trademark established and recognized
<p>RES#22 Support the Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020 adopted by the ASEAN-SEAFDEC Senior Officials; and</p> <p>RES#23 Pledge our commitment to fully support this Resolution and task ASEAN Senior Officials to implement necessary actions and report the progress in the advancement of sustainable fisheries that contribute to a prospectus, stable and peaceful ASEAN Community.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - National Plan of Action on Sustainable Fisheries for Food Security Towards 2020 developed

PLAN OF ACTION

PLANNING AND INFORMATION

Plan of Action	Activities
<p>POA#1 Integrate planning of marine capture fisheries, inland capture fisheries and aquaculture sub-sectors to promote sustainable development of fisheries sectors, including harvesting and post-harvest in both capture fisheries and aquaculture.</p>	<p>Philippines</p> <ul style="list-style-type: none"> - Management plans implemented to enhance fishery resources through habitat protection and law enforcement implementation accepted by various stakeholders <p>Viet Nam</p> <ul style="list-style-type: none"> - Master Plan of Fisheries Development approved by Prime Minister (Vision 2030 – for implementation until 2020)

Plan of Action	Activities
<p>POA#3 Strengthen national statistical mechanisms for fisheries and aquaculture and the exchange of statistical data and related information. Include other non-routine data and information such as fish consumption surveys as well as mobilizing local knowledge with the aim of improving the valuation of fisheries and monitoring their performance, to address the needs of the ecosystem approach to fisheries and adaptation to climate change.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - Capacity built for Fisheries Officers to effectively gather information
<p>POA#6 Coordinate, decentralize and enhance the sharing of relevant statistics and information of fisheries-related statistical data and information between the national fisheries and other authorities including those responsible for food security, environment, trade, aquaculture, water resources, agriculture/forestry, wetlands, migration/employment and rural development.</p>	<p>Viet Nam</p> <ul style="list-style-type: none"> - Officials of Directorate of Fisheries participated in relevant international and regional workshops

FISHERIES MANAGEMENT

Plan of Action	Activities
<p>POA#7 Regular review, update and strengthen national fisheries policy, legal and institutional frameworks through consultation and engagement of government agencies, private sectors, civil society and other relevant stakeholders.</p>	<p>Philippines</p> <ul style="list-style-type: none"> - Management plan for tuna, sardines, and blue swimming crab implemented through participatory approach and engagement of stakeholders (ongoing) expecting to improve stocks, productivity, production of the environment, increase income and reduce poverty of fishers <p>Viet Nam</p> <ul style="list-style-type: none"> - Guidelines for commercial fisheries management established
<p>POA#8 Accelerate the development of fisheries management plans based on an ecosystem approach, as a basis for fisheries conservation and management.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - National EAFM Steering Committee and EAFM Technical Committee established - EAFM framework and national plan of action developed/implemented based on stakeholders' consultation and knowledge sharing, including: training courses on EAFM; EAFM Pilot Projects (2014-2015); and Establishment of map on areas suitable for coral reef rehabilitation in some areas <p>Myanmar</p> <ul style="list-style-type: none"> - Marine fisheries resources survey conducted for the development of national and regional frameworks for the implementation of EAFM to fisheries management and to acquire additional knowledge on marine ecosystems for planning and monitoring programs <p>Philippines</p> <ul style="list-style-type: none"> - Approval and implementation of management plans using EAFM in a more holistic and effective manner <p>Viet Nam</p> <ul style="list-style-type: none"> - Draft plan for tuna fisheries management formulated/developed by integrating the eco-system approach in its action plan
<p>POA#11 Adopt co-management at all levels and with relevant stakeholders in the process of planning and policy formulation for management, conservation, and rehabilitation of habitats and</p>	<p>Philippines</p> <ul style="list-style-type: none"> - Co-management applied in planning and policy formulation for fisheries management including climate change

Plan of Action	Activities
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.	
POA#12 Strengthen capacity of fisheries communities, fisheries related organizations, NGOs and private sector to better implement necessary actions towards enabling the communities and local organizations to increase resilience improve livelihoods, alleviate poverty, adopt alternative livelihoods adapt to climate change in support to achieving sustainable development, and encourage participation of woman and youth groups in the process.	<p>Philippines</p> <ul style="list-style-type: none"> - Capacity building programs included the fisherfolks, NGOs and private sectors in programs formulated and implemented.
POA#13 Enhance and promote 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 assessment by providing data, local ecological knowledge, and status of the stocks.	<p>Malaysia</p> <ul style="list-style-type: none"> - Fishery volunteer community program established in 2015 with 5,000 members in whole Malaysia <p>Philippines</p> <ul style="list-style-type: none"> - Formulation of fisheries management policies always involved various stakeholders, and through support activities in research <p>Thailand</p> <ul style="list-style-type: none"> - Participation of communities in every level for effectively management of fisheries - Awareness of key stakeholders on the value of resources had risen
POA#15 Increase the efficient use of alternative energy sources and reduce the carbon fossil energy.	<p>Philippines</p> <ul style="list-style-type: none"> - Using sails and biofuel/gas as supplemental sources of energy for small boats - Using simple and responsible fishing gears
POA#16 Encourage good and appropriate employment practice in accordance with domestic laws and regulation	<p>Philippines</p> <ul style="list-style-type: none"> - Compliance of Labor Laws in employment of fishers
POA#17 Develop guidelines and enhance capacity of relevant authorities and communities to collaboratively resolve conflict with other stakeholders	<p>Philippines</p> <ul style="list-style-type: none"> - Survey conducted on non-traditional fishing grounds to obtain knowledge and improve potential fisheries resources

MARINE FISHERIES

Plan of Action	Activities
POA#21 Strengthen regional and national policy and legislation to implement measures to combat IUU fishing, including the development and implementation of national plans of action to combat IUU fishing, and promote the awareness and understanding of international and regional instruments and agreements through information dissemination campaigns.	<p>Brunei Darussalam</p> <ul style="list-style-type: none"> - NPOA IUU Fishing formulated through consultation between DOF and other relevant agencies, and the outputs also included plan and coordination work with relevant agencies in strengthening MCS program to combat IUU fishing <p>Malaysia</p> <ul style="list-style-type: none"> - MOU on fisheries between Malaysia and Indonesia drafted - Interpol trained on IUU-fishing <p>Viet Nam</p> <ul style="list-style-type: none"> - NPOA IUU Fishing developed/strengthened to prevent, reduce and eliminate IUU fishing with provisions relating to the management of fishing ports <p>Philippines</p> <ul style="list-style-type: none"> - NPOA IUU Fishing developed

Plan of Action	Activities
POA#22 Establish and strengthen regional and sub-regional coordination on fisheries management and efforts to combat IUU-fishing including development of regional or sub-regional development of MCS network	<ul style="list-style-type: none"> - Promotion made for sustainable practices and compliance to importing countries' requirements <p>Malaysia</p> <ul style="list-style-type: none"> - Guidelines on fishing licensing, boat registration, and port state measures to combat IUU-fishing developed - National database center set-up for monitoring fishing boats activities - Capacity built for fishery managers on fisheries management to combat IUU fishing <p>Philippines</p> <ul style="list-style-type: none"> - Measures to prevent IUU-fishing well included and issued
POA#25 Conduct research on the impact of various gear types and methods, including light fishing, trawls and push net, on ecosystem and populations of aquatic animals and also the effects of fishing vessel discharges and waste disposal on marine ecosystem, to promote the use of selective fishing gears and sustainable devices.	<p>Malaysia</p> <ul style="list-style-type: none"> - R&D on reduction of by-catch for <i>Acetes</i> spp. and usage of 38 mm mesh size in trawl net conducted <p>Philippines</p> <ul style="list-style-type: none"> - Studies on impacts of various fishing gears and lights conducted to support policy formulation <p>Thailand</p> <ul style="list-style-type: none"> - Aquatic species restored to natural water bodies to maintain economic abundance <p>Viet Nam</p> <ul style="list-style-type: none"> - Testing conducted on the use of circle hooks to minimize incidental catch of sea turtles - Training program conducted on escaping devices for reduction of unwanted catch
POA#26 Take reference from FAO international guidelines on managing by-catch and reducing discards, where appropriate, to identify and find solution to ASEAN by-catch problems, including the excessive catch of juvenile fish.	<p>Philippines</p> <ul style="list-style-type: none"> - By-catch reduction program implemented, including study on trawl by-catch in the Philippines - Policy on reducing discards (FAO237) enforced - Samar Sea Fisheries Management Plan prepared
POA#27 Optimize the use of inshore waters through resource enhancement program 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 resource development for the implementation of such programs.	<p>Malaysia</p> <ul style="list-style-type: none"> - 20 sites of artificial reefs made of concrete and steel materials were deployed - 2 sites of fishery <i>refugia</i> selected <p>Philippines</p> <ul style="list-style-type: none"> - Monitoring of Payao with Fisheries Observer Program conducted to determine its impact on fisheries resources
POA#28 Ensure inclusion of fisheries objectives in management plans of future MPAs and promote the adoption and use of <i>refugia</i> concept in line with the ASEAN/SEAFDEC Regional Guideline on the use of Fisheries <i>Refugia</i> in Capture Fisheries Management, where appropriate.	<p>Malaysia</p> <ul style="list-style-type: none"> - National coordination and management of fish stock and critical habitats improved <p>Philippines</p> <ul style="list-style-type: none"> - Monitoring and exploring the possibility of applying <i>fishery refugia</i> concept to increase productivity of fishing grounds
POA#29 Recognizing the different management approaches that are required, sustainably manage major critical habitats, such as mangrove, coral reefs and sea grasses; and develop and disseminate information and guidance on appropriate tools and interventions.	<p>Philippines</p> <ul style="list-style-type: none"> - Management of habitats to improve stocks sustainability formulated and implemented
POA#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	<p>Viet Nam</p> <p>Decisions (Decree) made and implemented for ensuring safety at sea</p> <p>Philippines</p>

Plan of Action	Activities
authorities while improving monitoring and control of the status of conditions, especially on small fishing boats.	<ul style="list-style-type: none"> - Provision of safety materials and appropriate boats design sustained
POA#31 Assess the possible impact of government subsidies on fisheries, particularly the impact on special requirements and the needs of small-scale fisheries in the region.	<p>Philippines</p> <ul style="list-style-type: none"> - Safety of boats and proper working conditions monitored

INLAND FISHERIES

Plan of Action	Activities
POA#32 Establishment fishery policy and legal framework for ecosystem approach to inland fishery management by integrating fisheries and habitat management that devolves co-management to the local authority and stakeholders, and at the same time strengthens the rights of communities and develops rights-based fisheries.	<p>Malaysia</p> <ul style="list-style-type: none"> - Fisheries Regulation and National Plan for Integrated Lake and Reservoir Management established, approved at the National Water Resources Council (2012) <p>Viet Nam</p> <ul style="list-style-type: none"> - Research on inland fishing capacity conducted for further development of management plan for inland fisheries - Environmental friendly fishing gear for inland fisheries developed and promoted - Result-based scientific information used for applying and implementing regulations related to fisheries management, including gear regulation, fishing area/season - Involvement of stakeholders enhanced for the protection and sustainable use of fisheries resources - Alternative livelihoods (tourism) promoted to reduce fishing pressure and the impact of capture fisheries on the resources and environment
POA#33 Undertake campaigns to promote awareness of importance of freshwater fisheries for local food security, and the importance of rehabilitating and restoring habitats for migratory freshwater fish, restocking indigenous fish species to enhance productivity and encouraging culture-based freshwater fisheries, where appropriate.	<p>Malaysia</p> <ul style="list-style-type: none"> - Awareness of school children, village communities and village working committees on improving fishing opportunity; restocking a depleted fish stock; conservation and reintroduction of endangered species had risen <p>Thailand</p> <ul style="list-style-type: none"> - Important aquatic species maintained in the natural waters through fisheries resources restocking programs
POA#36 Encourage coordinated planning on the use of inland waters, water-bodies and flood plains through (i) resource enhancement program; (ii) inland wetlands and fisheries management programs; (iii) consideration of restocking of locally and/or commercially-important inland fish species; and (v) giving priority to human resources development for the implementation of such programs.	<p>Malaysia</p> <ul style="list-style-type: none"> - Indigenous freshwater fish sanctuaries and protected areas established - Community-based management system (so-called Tagal system practiced by Sabahan local traditional fishers) implemented in Sabah Rivers to improve fish stock for the Kelah fish - National water resources policy and management measures developed through a wide range of consultation processes <p>Viet Nam</p> <ul style="list-style-type: none"> - Method/technology improved to enhance inland fisheries in harmony with other sectors such as rice farming and water resources management - Research on inland fishing capacity conducted for further development of co-management model

AQUACULTURE

Plan of Action	Activities
<p>POA#39 Ensure that national programs and policies on aquaculture address social, economic and environmental aspects of sustainable aquaculture to improve food security, livelihoods, employment and poverty alleviation by (i) providing the mechanisms and enabling environment for good aquaculture practices, efficient markets and fair trade; (ii) strengthening the capacity of small-holders farmers; and (iii) promoting inter-agency collaboration.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - National policies developed and implemented for transformation and restructuring of freshwater aquaculture; rearrangement of aquaculture activities for SMEs; enhancement of the involvement of young agropreneurs; and promotion of good aquaculture practices - Mobile marketing of agricultural products established with good quality of products and good price for farmers <p>Myanmar</p> <ul style="list-style-type: none"> - Project on sustainable development and mangrove friendly small-scale aquaculture and fisheries implemented → capacity of communities enhanced for co-managing fisheries and aquaculture systems within mangrove ecosystems; formulation and co-management plan and its promotion developed; post-harvest processing of fisheries products and market access improved; and vulnerability of community reduced <p>Philippines</p> <ul style="list-style-type: none"> - National Mariculture Development Program provided livelihood opportunities on mariculture for fisherfolk in order to accelerate socio-economic growth and food security, provide appropriate infrastructures, equipment and support services to operate cost-effectively and securely as well as develop skills and technical-capable manpower to support the mariculture industry - Mangrove Rehabilitation Program implemented through replanting of mangroves in priority areas such as abandoned, underdeveloped and underutilized fishponds under the Fish Pond Lease Agreements (FLAs) and identified key biodiversity areas by the Department of Environment and Natural Resources (DENR), involving also coastal fisherfolk in planting 100 million mangrove propagules within 3 to 4 years of project implementation - Aquaculture Livelihood to be established through the aquasilviculture projects targeting at least 1,000 coastal fisherfolk - Community-Based Multi-species Hatchery to be developed in 62 State Universities and Colleges - Organic Aquaculture Program implemented through the promotion of polyculture production system using indigenous/endemic species under the extensive and semi-intensive systems to produce safe aquaculture products of premium quality - Organic farming protocols known as the Philippine National Standard on Organic Aquaculture developed for the following species: milkfish monoculture using natural food, tilapia monoculture, ulang monoculture, mangrove crab monoculture, giant gourami monoculture, pangasius monoculture, milkfish and crab polyculture, tilapia and ulang polyculture

Plan of Action	Activities
	<ul style="list-style-type: none"> - National Seaweeds Development Program aims to strengthen collaboration/ partnership with private sectors by providing adequate supply of quality seedlings/planting materials to seaweed farmers, livelihood assistance by providing farming implements, and capability building of farmers to become NC II certified by TESDA. The project included the establishment of seaweed nurseries to provide farmers with start-up seedlings, establishment of solar dryers, promotion/development of other seaweed species with market and economic importance (<i>Caulerpa racemosa</i> and <i>Gracilaria</i>), and the development of Philippine Nori Seaweed Industry Program (PhilNori)
<p>POA#40 Develop and implement ASEAN guidelines for environment-friendly and responsible aquaculture and good aquaculture practices that cover (i) the integration of quality and safety management system for products with significant trade potential; (ii) the harmonization for chemical use and food safety in aquaculture; (iii) the development of product traceability systems from farm to market; and (iv) harmonization of the quarantine and inspection/sampling procedure and Sanitary and Phytosanitary (SPS) measures for aquaculture products to secure food safety.</p>	<p>Brunei Darussalam</p> <ul style="list-style-type: none"> - Capacity built for farmers in fulfilling the minimum requirements in biosecurity <p>Malaysia</p> <ul style="list-style-type: none"> - A number of farms are complying with the Malaysian Good Aquaculture Practice - Involvement in developing ASEAN-GAP - Monitoring the use of drugs, antibacterial, etc. to ensure safety food for consumption (Aquaculture Residue Monitoring System – ARMS) - Human resources capabilities for responsible aquaculture enhanced/built <p>Thailand</p> <ul style="list-style-type: none"> - Quality of aquaculture products improved - GAP certification for aquaculture farms developed
<p>POA#41 Integrate aquaculture into rural development activities within context of multiple-use of land and water resources through inter-agency coordination in policy formulation, project planning and implementation, stakeholder consultation, extension services and technology transfer, participate in and provide support to regional initiatives that will assess the role of aquaculture in poverty alleviation for better policy formulation.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - Aquaculture industrial zoning established to increase production and create additional employment - Permanent food production park established - General knowledge and new techniques of fisheries officers improved and obtained through training programs for managing freshwater aquaculture for rural area development <p>Myanmar</p> <ul style="list-style-type: none"> - Project on small-scale aquaculture extension for promotion of livelihood of rural communities implemented (2009-2012) → number of farmers on small-scale aquaculture increased for 5 townships and livelihoods of those increased; and capacity of DOF local officers developed <p>Viet Nam</p> <ul style="list-style-type: none"> - Two (2) model of aquaculture applying VietGAP developed and associated with program on new rural development to improve income of the farmers
<p>POA#42 Implement measures or strategies at national and local levels to (i) monitor and regulate aquaculture operations; (ii) prevent over development; and (iii) ensure that activities are carried out in an environment-friendly manner. This also includes effectively enforcing regulations to avoid conflict in the use of common resources and adopting the concept of environmental capacity as a strategy to prevent aquatic pollution brought about</p>	<p>Brunei Darussalam</p> <ul style="list-style-type: none"> - Measures for waste water management developed based on environment-friendly concept - Specific pathogen-free (SPF) <i>P. Monodon</i> broodstocks and fry produced and commercialized - Production and grow out culture farms of giant freshwater prawn (<i>Macrobrachium rosenbergii</i>) developed - Proper culture and fish husbandry practices

Plan of Action	Activities
intensification of aquaculture activities.	<p>introduced through a model farm project for fish cage culture operators</p> <ul style="list-style-type: none"> - Shrimp production from aquaculture increased through establishment of new shrimp culture areas, offshore cages, and freshwater culture areas - Model shrimp farm producing big size shrimps of over 50 g developed through the introduction of recirculating system - Results from R&D on oyster culture (to be completed in 2016) improved <p>Malaysia</p> <ul style="list-style-type: none"> - Report on environmental impact assessment (EIA) published - Regular monitoring of aquaculture development project implemented - e-Aquaculture established to provide technical advice to farmers concerning site selection, fish handling, diseases and culture management - SPF broodstocks from approved source imported <p>Thailand</p> <ul style="list-style-type: none"> - Transportation and information technology (Green Project) linked - Activities related to carbon footprints prepared - Protein from fish and income from aquaculture increased through the Royal Project - Capacity of farmers enhanced on breeding and others in responding to the needs of farmers resulting in increased aquaculture production <p>Viet Nam</p> <ul style="list-style-type: none"> - Decision made for producing fisheries products that can meet requirements of importers, including GAP standard, conserving the environment, and protecting the rights of labor in fisheries - Original broodstock of white shrimp (<i>P. vannamei</i>) for hatchery produced/introduced - Training on management technology of shrimp broodstock conducted
<p>POA#43 Provide government support for R&D on (i) improving existing genetic resources; (ii) assessing the impact of climate change on broodstock management; and (iii) the feeding and disease management of broodstock.</p> <p>POA#44 Promote the production and distribution of specific pathogen-free (SPF) and quality seed through the (i) establishment of certified government or private hatcheries as sources of quality seed; (ii) dissemination of new breeding technologies and techniques for effective distribution and maintenance of genetically improved strains; and (iii) implementation of sound policies that will improve better hatchery management practices, including the responsible collection and use of wild broodstock and seed.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - Nucleus Broodstock Center (NBC), and Broodstock Multiplying Center (BMC) established - Genetics of red tilapia improved - Produced SPF of <i>M. rosenbergii</i> broodstock domesticated and genetically improved <p>Brunei Darussalam</p> <ul style="list-style-type: none"> - Good quality of seed supply produced for the industry - Production of marine fish at sustainable level increased - Proper culture and fish husbandry practices introduced through a model farm project for fish cage culture operators
POA#45 Apply concept of aquatic biosecurity by providing support to (i) research for development of domesticated, genetically improved, specific pathogen-free (SPF) cultured species; (ii) the small-scale hatchery operators and farmers so as to	<p>Malaysia</p> <ul style="list-style-type: none"> - Quality broodstock introduced/provided to local farmers through training program on broodstock management - Appropriate technology for small-scale hatchery

Plan of Action	Activities
enhance their access to healthy broodstock and improve their ability to adopt, at the farm level, the established techniques for aquatic animal health care.	adopted
POA#47 Encourage good and appropriate employment practices in accordance with domestic laws and regulation.	<p>Malaysia</p> <ul style="list-style-type: none"> - Guidelines on occupational safety and health in accordance with Act 1994 established based on results of survey on safety at workplaces
POA#49 Reduce the risk of negative environmental impacts, loss of biodiversity, and disease transmission by regulating the introduction and transfer of aquatic organisms in accordance with the Regional Guidelines on the Responsible Movement of Live Aquatic Animals and Plants.	<p>Malaysia</p> <ul style="list-style-type: none"> - National committee on risk assessment and importation of alien species established in 2011 - Malaysian Quarantine and Inspection Services established at 52 entry points all over the country for monitoring the transfer of aquatic organisms
POA#50 Continue the national efforts to control serious disease outbreaks by providing government support to (i) R&D to improve the ability to handle new and emerging diseases and surveillance of transmission of diseases to wild populations; and (ii) regional initiatives on harmonization of regional disease control standards, disease reporting and implementation of contingency plans to handle new and emerging diseases.	<p>Malaysia</p> <ul style="list-style-type: none"> - Disease surveillance program established - Fish disease contingency plan developed - Fish disease notification mechanism established - Disease monitoring on AHPND (previously known as EMS) implemented
POA#51 Further enhance the capabilities in the diagnosis and control of fish diseases within the region through (i) continued support in development of technology and techniques for diseases identification; (ii) promotion of the widespread use of affordable, field-friendly, rapid and standardized diagnostic tests; and (iii) establishment of regional and inter-regional referral systems, including the designation of reference laboratories and timely access to disease control experts within the region.	<p>Brunei Darussalam</p> <ul style="list-style-type: none"> - Periodic surveillance program for diseases in aquaculture farms implemented - Diseases early warning system established leading to increased survival rate of up to 80% - Spread of diseases minimized <p>Malaysia</p> <ul style="list-style-type: none"> - Capacity of the National Fish Health Lab built through training programs - Proficiency Testing (PT) on aquatic animal diseases established - Capacity of farmers, extension staff and state biosecurity staff built through training programs - Reference Lab (NAFISH) established for timely access to disease control experts in the region <p>Thailand</p> <ul style="list-style-type: none"> - Trade agreement established between member countries to conduct disease surveillance program for raw products from bivalves, shrimp, and fish in order to minimize losses caused by disease outbreaks
POA#52 Develop regional warning systems on aquatic animal health and diseases to inform other Member Countries of relevant epidemiological events and to raise awareness of new diseases that may pose risks. Build emergency preparedness capacity through rapid and timely responses to reduce potential catastrophic consequences of diseases.	<p>Malaysia</p> <ul style="list-style-type: none"> - Aquatic animal health and occurrences of diseases reported <p>Viet Nam</p> <ul style="list-style-type: none"> - Ongoing project on environmental monitoring for aquaculture, and national program on fisheries diseases (2015 to 2020) carried out
POA#53 Improve the efficient use of aquatic feeds by strictly regulating the quality of manufactured feed and feed ingredients and support continued research for developing suitable alternative protein sources that will reduce the dependence on fish meal and other fish-based products. This effort will include the consideration of ingredients not derived	<p>Malaysia</p> <ul style="list-style-type: none"> - R&D in finding suitable alternative protein source to replace fishmeal focusing on locally available ingredients to support fishery production conducted

Plan of Action	Activities
from wild caught fish, encouraging the culture of species requiring no or low fish meal content in their feed and applying effective feeding management practices, taking into account the need for cultural and social acceptance of alternative feed ingredients.	
POA#55 Formulate and implement national policies and strategies that will enable the aquaculture sector to mitigate and/or adapt better to the impacts of climate change. These strategies should include providing support to R&D on climate change, increasing resilience, and strengthening the overall capacity of various stakeholder groups and fostering cooperation within the aquaculture sector and with other sectors.	<p>Malaysia</p> <ul style="list-style-type: none"> - National policy on climate change (2010) developed - Results from R&D on climate change to be reported - Water monitoring to assess the effect of climate change on aquaculture conducted - Impact of climate change on water quality, aquaculture production and fish health mitigated
(POA#57) Encourage Member Countries to take a precautionary approach to safeguard the environment from the acceleration of offshore aquaculture, and to consider developing regional guidelines on responsible marine (inshore to offshore) aquaculture.	<p>Malaysia</p> <ul style="list-style-type: none"> - Plan for inshore and offshore aquaculture developed

OPTIMAL UTILIZATION OF FISH AND FISHERY PRODUCTS

Plan of Action	Activities
POA#58 Introduce and provide support for the development and application of technologies that optimize the utilization of catches, reduce post-harvest losses, wastes and discards in commercial and small-scale fisheries and processing operation, through improved processing, facilities and infrastructure development, on-board and on-shore handling, storage, distribution and marketing of fish and fishery products.	<p>Brunei Darussalam</p> <ul style="list-style-type: none"> - Production from the seafood processing industries increased and upgraded - Capacity built for seafood processors on processing technology, safety and quality of seafood products with some processors penetrating the export market - Quality of seafood maintained <p>Malaysia</p> <ul style="list-style-type: none"> - Capacity built for over 8,000 participants (capture, aquaculture, fishery products) during 2012 to 2015 - Fisheries officials trained on fish handling, fish processing - Certification systems for HALAL & MEST developed - Training courses conducted on fish related to public health to upgrade the technical skills and competences of DOF personnel (e.g. HACCP, ISO, Audit, Sampling, etc.) <p>Philippines</p> <ul style="list-style-type: none"> - Technology verification and transfer promoted - Implementation of comprehensive post-harvest and ancillary industries plan - Distribution, upgrading and monitoring of fisheries post-harvest facilities <p>Thailand</p> <ul style="list-style-type: none"> - Research on aquatic products conducted for value-added marine products - Aquaculture farms developed in compliance with good access to green urban agriculture
POA#59 Promote the production of and preserve the diversity of traditional fish products by assisting producers to secure stable supplies of quality raw materials, meet food safety requirements and to improve product identity, nutritive value and	<p>Philippines</p> <ul style="list-style-type: none"> - Technical assistance program (training on food safety requirements for GMP/SSOP/HACCP and HALAL certifications) and information campaign (IEC material dissemination)

Plan of Action	Activities
marketing. In the process, promote local fishery products.	<ul style="list-style-type: none"> - Participation to trade fairs and international seafood fora
POA#60 Develop traceability system with mechanism as needed to certify or validate the information, for the whole supply chain, and establish regulations and enforcement schemes in line with international standards. Align Member Countries' inspection systems and incorporate strengthened port inspections in the process as a means to improve inspection systems.	<p>Malaysia</p> <ul style="list-style-type: none"> - Traceability system for ornamental and food fish established - Traceability system for all stages in the supply chain (2011 to present) established - e-Biosecurity system for fish (2012 to present) - e-Permit for live fish movement at the entry/exit point (2013 to present) - Certification of processing plants <p>Philippines</p> <ul style="list-style-type: none"> - Traceability system and enforcement scheme in various productions of the whole supply chain of fish and fishery products
POA#61 Strengthen fish quality and safety management systems that support competitive position of ASEAN fish products in the world market, 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.	<p>Malaysia</p> <ul style="list-style-type: none"> - 6 lab accredited with ISO/IEC 17025 - National Reference Lab for fish health established <p>Philippines</p> <ul style="list-style-type: none"> - Upgrading facilities and services of laboratories, implementation of risk-based inspection and recognition scheme for testing laboratories - Technical skills of laboratory analysts enhanced <p>Thailand</p> <ul style="list-style-type: none"> - Inspection and certification of fishery products for standard and monitoring from farm to table including certification quality of marine products for export
POA#62 Encourage relevant control agencies in applying appropriate legislation and coordinated activities regarding the handling, processing, distribution, storage, marketing, quality and safety of fish and fishery products.	<p>Malaysia</p> <ul style="list-style-type: none"> - Cooperation between Central Competent Authority with Competent Authority on fish and fisheries products established through the conduct of Market Access Group Meeting <p>Philippines</p> <ul style="list-style-type: none"> - Codes of practices on proper handling, processing, storage, and distribution of fish/fishery products implemented - Mandatory accreditation of cold storage warehouse implemented - Assurance of fish/fishery products safety and quality
POA#63 Promote and conduct training programs and develop training materials to upgrade technical skills and competencies of personnel in the public and private sectors on fisheries post-harvest technology and food safety management system.	<p>Philippines</p> <ul style="list-style-type: none"> - Capacity building program and technology disseminated to BFAR regional offices, industries, other stakeholders on various fisheries post-harvest technologies, GMP, SSPO/HACCP and HALAL Certifications to maintain access in the global market
POA#66 Develop standard and guidelines for aquaculture products handling and transportation, hygienic vessel design and construction, and include training of fish handling as part of the requirement for issuance of permits at all vessel crews, and encourage new workers to enter the industry where needed.	<p>Malaysia</p> <ul style="list-style-type: none"> - Malaysia Good Aquaculture Practice Guidelines developed and implemented - Hygiene on Board Guidelines developed and implemented - Posters on animal diseases of susceptible characteristics published. - Harmonization of Malaysia GAP Guidelines with those of the ASEAN conducted <p>Philippines</p> <ul style="list-style-type: none"> - Formulation and establishment of standards and guidelines for handling, transport of fishery and aquaculture products

FISH TRADE

Issues/Activities	Countries
<p>POA#68 Establish regional/ASEAN standards applicable for fishery and aquaculture products that are in line with international requirements and applicable to the region. Harmonize standards, technical regulations and conformity assessment procedures as inputs for the establishment of the ASEAN Policy Guidelines on Standards and Conformance, to increase the competitiveness of fishery products on regional and international markets.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - ASEAN-GAP standard implemented - Live fish movement well controlled (since 2011) in accordance with the Guidelines on responsible movement of live food finfish - Chemical use in aquaculture well controlled in accordance with the Guidelines on the use of chemicals in aquaculture (since 2014) - Importation of live finfish well controlled (since 2010) in accordance with the WTO notification of import requirements for live fish - Development of branding of fish and fishery products including Halal requirements encouraged
<p>POA#69 Strengthen cooperation among Member Countries to work towards common positions reflecting international fish trade related fora, such as WTO, FAO, OIE, Codex Alimentarius Commission, CITES.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - Inputs on Malaysia's position provided at relevant international meetings (SEAFDEC, CODEX, OIE, CITES, ASWGF, RCEP-SWGSPS, FTA, and others)
<p>POA#71 Assist small-scale producers to comply with standards on safety and quality of fish and fishery products by providing support programs including training.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - Training on fisheries biosecurity measures conducted for educating stakeholders to fulfill biosecurity
<p>POA#74 Encourage implementation of appropriate international standard and strengthen program relevant to Sanitary and Phytosanitary (SPS) measures, Technical Barriers to Trade (TBT) measures, R&D, as well as capacity building and awareness raising on fish trade-related issues, and information dissemination recognizing the different status of development in Member Countries.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - Capacity built for Officials on techniques for biotoxin analysis
<p>POA#75 Strengthen risk assessment and R&D related to the use of GMO products in fisheries and aquaculture, including food safety issues.</p>	<p>Malaysia</p> <ul style="list-style-type: none"> - Discussion made with GMO meeting under Department of Biosafety – NRE on the use of GMO products in fisheries and aquaculture and share information and lessons learned

REGIONAL AND INTERNATIONAL POLICY FORMULATION

Issues/Activities	Countries
<p>POA#76 Increase participation and involvement of Member Countries in International fora and technical commitment such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), <i>Codex Alimentarius Commission</i>, Food and Agriculture Organization of the United Nations (FAO), Office International des Epizooties (OIE), Regional Fisheries Bodies (REBs), 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 the global level.</p>	<p>Brunei Darussalam</p> <ul style="list-style-type: none"> - National fishery policy developed based on regional management policy <p>Malaysia</p> <ul style="list-style-type: none"> - Inputs provided to various international fora to reflect Malaysia's position

HIGH-LEVEL CONSULTATION ON REGIONAL COOPERATION IN SUSTAINABLE FISHERIES DEVELOPMENT TOWARDS THE ASEAN ECONOMIC COMMUNITY: COMBATING IUU FISHING AND ENHANCING THE COMPETITIVENESS OF ASEAN FISH AND FISHERY PRODUCTS

Executive Summary

The Concept Note for the High-level Consultation on Regional Cooperation In Sustainable Fisheries Development Towards the ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products was addressed at the 47th Meeting of the SEAFDEC Council and later supported by the 23rd Meeting of the ASWGFi. The High-level Consultation has objectives to: 1) Enhance the awareness on the significance of regional cooperation in sustainable fisheries development; and 2) Seek high-level policy support from the ASEAN Member States through the “Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products”

This paper, consists of concept note and the work plan, aims to update the preparatory process, regional technical consultation(s) and multi-stakeholders consultation(s) that have been organized (prior to the High-level Consultation) to review the fisheries situation and the emerging issues that hinder the sustainable development of fisheries in the region. Considering the progresses of actions taken by the region, and practical steps toward addressing such IUU fishing issues, the results from these consultation(s) would serve as basis for formulating the Draft “Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products”, to be submitted for consideration by the SEAFDEC Council of Directors prior to the High-level Consultation for endorsement by high-level officials of the ASEAN Member States.

REQUIRED CONSIDERATION BY THE MEETING

The Program Committee is requested to take note proposed work plan and preparatory process for formulating the Draft “Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products”. The Committee is also invited to advise and comments to SEAFDEC and Member Countries on the cooperation in formulating of the Draft Joint ASEAN-SEAFDEC Declaration.

CONCEPT NOTE

HIGH-LEVEL CONSULTATION ON REGIONAL COOPERATION IN SUSTAINABLE FISHERIES DEVELOPMENT TOWARDS THE ASEAN ECONOMIC COMMUNITY:

Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products

(Revised after 47th Council and 23rd ASWGFi Meetings)

I. BACKGROUND AND INTRODUCTION

SEAFDEC in collaboration with the ASEAN organized in June 2011 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”. During the Conference, the Ministers and Senior Officials responsible for fisheries of the ASEAN-SEAFDEC Member Countries adopted the “Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020” which has since then served as policy framework for sustainable development of fisheries and enhancing its contribution to food security and the well-being of people in the region.

While the Member Countries with technical support from SEAFDEC have been implementing activities at the national and regional levels guided by the Resolution and the Plan of Action, the region has been encountering emerging issues that require closer cooperation among countries, e.g. the more stringent measures applied by importing countries both within and outside the region, toward combating Illegal, Unreported and Unregulated (IUU) fishing and ensuring that fish and fisheries products are derived from responsible fishing activities. Therefore, cooperation among relevant national agencies as well as among countries in the region is necessary in order to come up with practical and harmonized approaches that would enhance the competitiveness of fish and fishery products traded in intra-regional or international markets.

SEAFDEC considers that after five years of promoting the Resolution and the Plan of Action in the region, it is an opportune time to conduct an in-depth review of the emerging regional issues that hinder fisheries development, identify measures particularly those that require regional cooperation and intervention, and seek the countries’ high-level commitment and continued efforts to address such issues in an efficient manner.

As preparatory process, regional technical consultation(s) and multi-stakeholders consultation(s) would be organized (prior to the High-level Consultation) to review the fisheries situation and the emerging issues that hinder the sustainable development of fisheries in the region as well as the progress of actions taken by the region, and recommend practical steps toward addressing such issues. Results from these consultation(s) would serve as basis for formulating the Draft “*Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products*”, to be submitted for consideration by the SEAFDEC Council of Directors prior to the High-level Consultation for endorsement by high-level officials of the ASEAN Member States.

It is expected that the said “*Joint Declaration*” would assure high-level policy support and cooperation from relevant national agencies towards sustainable fisheries development. In addition, the “*Joint Declaration*” would also provide a framework to enable SEAFDEC and relevant agencies and donor organizations to sustain support for enhancing regional cooperation in sustainable fisheries development in light of the unification of the ASEAN Economic Community after the year 2015 and beyond.

The Concept Note for the conduct of the High-level Consultation was supported by the 47th Meeting of the SEAFDEC Council and the 23rd Meeting of the ASWGFi.

II. THE EVENTS

2.1 Regional Technical Consultation(s)

The Regional Technical Consultation(s) (RTCs) would be convened as preparatory process, with **objectives** to:

- 1) Review updated information on emerging issues and challenges that hinder the sustainable development and management of fisheries in the region; and
- 2) Recommend the ways and means of addressing emerging issues and challenges, as well as the possible roles and responsibilities of concerned agencies.

The **participants** of the RTCs would include the senior officers of the agencies responsible for fisheries, and officers of SEAFDEC, researchers from academic and research institutions, and representatives from other international/regional organizations.

Issues (tentative) to be discussed at the RTCs include:

- Current situation in ASEAN Member States (reviewed and presented by countries)
- Regional cooperation for combating IUU fishing
 - Preventing entry of IUU fishing products to supply chain
 - Catch documentation scheme (including ACDS)
 - Fishing vessel registration, licensing, and regional fishing vessels record (including RFVR)
 - Management of fishing capacity (including RPOA-Capacity)
- Enhancing the competitiveness of ASEAN fish and fishery products
 - Labor issues, migratory workforce, working conditions and safety at sea
 - Safety/hygiene of fish and fishery products
 - Others (to be identified during the consultations)

In addition, relevant issues that may emerge after the monitoring of progress in implementation of the Resolution and Plan of Actions Towards 2020 could also be incorporated.

It is expected that the RTCs would come up with **outputs** as follows:

- 1) Updated information on current situation, progress and remaining issues/challenges that hinder the sustainable development of fisheries and the competitiveness of ASEAN fish and fishery products; and
- 2) Recommendations on way forward in addressing the issues/challenges, as well as the possible roles and responsibilities of concerned agencies, at national and regional levels, to enhance regional cooperation.

2.2 Multi-stakeholders consultation(s)

Multi-stakeholder consultation(s) has **objective** to inform the relevant stakeholders of the results from the preparatory RTCs, particularly the recommendations on ways and means of addressing emerging issues and challenges, in order to see the applicability for the relevant stakeholders and private sector.

The **participants** of the Multi-stakeholder consultation(s) would include officers from agencies responsible for fisheries as well as other concerned agencies (at operational levels), and relevant stakeholders including the private sector (including producers, processors and traders).

The **expected outputs** from the multi-stakeholders consultation(s) would be the views from participants which could be accommodated with the recommendations from the preparatory RTCs, to serve as a basis for development of the Joint Declaration.

2.3 The High-level Consultation

The SEAFDEC Secretariat would analyze the results from the preparatory Regional Technical Consultation(s) and the multi-stakeholders consultation(s) in order to come up with the draft “*Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products*” for consideration by the SEAFDEC Council. Upon the endorsement by the Council, SEAFDEC would convene a “*High-level Consultation on Regional Cooperation in Sustainable Fisheries Development Towards the ASEAN Economic Community: Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products*”.

Objectives

The High-level Consultation has objectives to:

- 1) Enhance the awareness on the significance of regional cooperation in sustainable fisheries development; and
- 2) Seek high-level policy support from the ASEAN Member States in addressing emerging issues and challenges, and to ensure regional cooperation in sustainable fisheries development.

Date and Venue

The High-level Consultation would be organized on 3 August 2016, in Bangkok, Thailand, and hosted by the Department of Fisheries of Thailand. The event is to be held back-to-back with the ASEAN Fisheries and Aquaculture Conference and Exposition to be organized on 4-6 August 2016 in Bangkok, Thailand.

Expected Participants

It is expected that the High-level Consultation would be attended by:

- 1) High-level officials (SOM level) from the ASEAN-SEAFDEC Member Countries;
- 2) SEAFDEC Council Directors, together with delegates from fisheries authority of the respective ASEAN-SEAFDEC Member Countries;
- 3) SEAFDEC: Secretary-General, Deputy Secretary-General, Department Chiefs and senior officers from SEAFDEC Secretariat and Departments;
- 4) High-level officials or representatives from the ASEAN Secretariat; and
- 5) Representatives from donor agencies and regional/international organizations, *e.g.* FAO, Government of Sweden, USAID, etc.

Expected Outputs

The expected outputs from the High-level Consultation is the Adoption of the “*Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products*” by high-level officials of the ASEAN Member States.

Tentative Programs

3 August 2016 (Wednesday)

9.00-10.30 (Open session)	1) Opening of the Consultation <ul style="list-style-type: none"> • Welcome Address by Minister of Agriculture and Cooperatives of Thailand • Remarks by the SEAFDEC Secretary-General • Remarks by the ASEAN Secretariat: Policies Towards Fisheries Development under the ASEAN Economic Community
	2) Report of the SEAFDEC Secretary-General
10.30-11.00	Coffee Break
11.00-12.30	3) Challenges and Opportunities for ASEAN Cooperation in Fisheries in a Changing Environment (<i>summary of issues, challenges and recommendations on way forward -- as a result of multi-stakeholders consultation</i>)
12.30-14.00	Lunch Break
14.00-15.30 (Closed session)	4) Statements by High-level Officials of the ASEAN-SEAFDEC Member Countries. 5) Adoption of the “ <i>Joint ASEAN-SEAFDEC Declaration on Regional Cooperation for Combating IUU Fishing and Enhancing the Competitiveness of ASEAN Fish and Fishery Products</i> ”
15.30-16.00	Coffee Break
16.00-17.00 (Open session)	6) Cooperation with Donors and International/Regional Organizations (<i>Statement on areas of mutual interest and possible scopes for future cooperation</i>) 7) Closing of the Consultation 8) Press Statement

III. SCHEDULE OF WORKS

- 1) 47th SEAFDEC Council Meeting (**early April 2015**) – Endorsement of the Concept Note.
- 2) 23rd ASWGF Meeting (**June 2015**) – Endorsement of the Concept Note.
- 3) Submission of the Concept Note for consideration by high-level authority of ASEAN (as appropriate)
- 4) Conduct of regional technical consultation(s) and multi-stakeholders consultation(s) (**September-April 2016**) – Preparation of technical inputs for the “*Joint Declaration*”
- 5) Drafting of the “*Joint Declaration*” (**May 2016**) – Drafting committee from the ASEAN-SEAFDEC Member Countries and SEAFDEC will work on this.
- 6) Circulation of the “*Joint Declaration*” to the ASEAN-SEAFDEC Member Countries (SEAFDEC Council) (**June**) – Endorsement of the “*Joint Declaration*” by ASEAN-SEAFDEC Member Countries.
- 7) Conduct of “*High-level Consultation*”, and endorsement of the “*Joint Declaration*” by high-level officials of the ASEAN-SEAFDEC Member Countries (**3 August 2016**)

INTERNATIONAL GUIDELINES FOR SECURING SUSTAINABLE SMALL-SCALE FISHERIES AND WAY FORWARDS FOR SOUTHEAST ASIAN REGION

Executive Summary

The “International Guidelines for Securing Sustainable Small-Scale Fisheries (SSF)” was finally endorsed at the 31st Session of COFI in June 2014. The Guidelines would serve as a fundamental tool to support FAO’s vision of eradicating hunger and promoting sustainable development as outlined in FAO’s new strategic framework. Furthermore, it should be noted that the SSF Guidelines was developed through global consultation processes that involved more than 4,000 representatives from member governments, small-scale fishers, fish workers and their organizations, researchers, development partners, and other relevant stakeholders representing more than 120 countries in six regional and more than 20 civil-society organization-led national consultative meetings.

The SSF Guidelines has the objective of: a) enhancing the contribution of small-scale fisheries to global food security and nutrition, in order to support the progressive realization of the right to adequate food, b) contributing to the equitable development of small-scale fishing communities and poverty eradication, to improve the socio-economic situation of fishers and fish workers within the context of sustainable fisheries management, c) achieving sustainable utilization, prudent and responsible management and conservation of fisheries resources consistent with the CCRF and related instruments, d) promoting the contribution of small-scale fisheries to an economically, socially and environmentally sustainable future for the planet and its people, e) providing guidance that could be considered by States and stakeholders for the development and implementation of ecosystem friendly and participatory policies, strategies and legal frameworks for the enhancement of responsible and sustainable small-scale fisheries, and f) enhancing public awareness and promoting the advancement of knowledge on the culture, role, contribution and potential of small-scale fisheries, considering ancestral and traditional knowledge, and its related constraints and opportunities. The SSF Guidelines clearly states that these objectives should be achieved through the promotion of a human rights-based approach, by empowering small-scale fishing communities—including both men and women, to participate in decision-making processes and to assume responsibilities for sustainable use of fishery resources, by placing emphasis on the needs of developing countries and for the benefit of vulnerable and marginalized groups.

As the SSF Guidelines is voluntary in nature, even if it includes specific focus on the needs of developing countries, **it is global in scope**. The high concentration of small-scale fisheries in the Southeast Asian region that continues to contribute to the economies of the countries, the diversity and complexity of small-scale fisheries based on the way it is nested in, and the characteristics of fisheries for subsistence and other small-scale which vary between regions and among developing-developed countries, should be considered during the development of the Regional Guidelines on small-scale fisheries. Nevertheless, gender issues, employment in fishing and post-harvest activities, and occasional fishers and complex livelihoods, could also be considered. Since some provisions in the SSF Guidelines may not be applicable or suitable for small-scale fishers in the Southeast Asian region, SEAFDEC is therefore requested by the Member Countries to propose adaptive measures to regionalize the SSF Guidelines through a regional process of consultations and meetings with the Member Countries and other relevant stakeholders.

At the same time, the South East Asia Regional Consultation Workshop on the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication was held in Bali, Indonesia, on 24-27 August 2015. It was co-organized by the Ministry of Marine Affairs and Fisheries (MMAF) of the Republic of Indonesia and the Food and Agriculture Organization of the United Nations (FAO), while FAO Bay of Bengal Large Marine Ecosystem (BOBLME) Project and SEAFDEC is invited to collaborate on this. The workshop was attended by 116 participants including representatives of governments, regional and international organizations, fisher-folk organizations, Civil Society Organization (CSOs), NGOs, academia and other relevant actors. Nine SEAFDEC Member Countries except Brunei Darussalam and Lao PDR join the meeting. The objectives of the workshop were to raise awareness and develop a draft South East Asian Regional Plan of Action to support the implementation of the Voluntary Guidelines for Securing

Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication in the South East Asia region. The result from this meeting is a proposed zero draft of Plan of Action which is a part of the Summary conclusions and recommendations of the South East Asia Regional Consultation Workshop on the Implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication as appeared in **Appendix 1**.

It is expected that SEAFDEC would further process for the endorsement of the RPOA-SSF, however, SEAFDEC would like to consult with ASEAN-SEAFDEC Member Countries before any further action either to continue finalizing the RPOA-SSF or consider for the Regionalized Guidelines for SSF as suggested by Member Country. In view of SEAFDEC, the RPOA-SSF are also reflect the regional requirements for securing sustainable small-scale fisheries, in addition, the RPOA-SSF is directly translated into the action plan which is useful for AMSs to implement. To support and improve the zero draft RPOA-SSF, SEAFDEC prepared the questionnaires to compile the views of AMSs on International Guidelines and identify the action plan needs, the questionnaires will be circulated to all AMSs in mid November 2015.

REQUIRED CONSIDERATION BY THE MEETING

The SEAFDEC Program Committee is requested to take note of the progress on development of the zero draft RPOA-SSF from Bali Workshop, and also invited to provide comments and advices on the proposed zero-draft RPOA-SSF. In addition, the Meeting is also requested to provide policy guidance and way forward on the securing sustainable small-scale fisheries, either we move forward on the RPOA-SSF or not under the ASSP mechanism.

**Summary Conclusions and Recommendations of the
South East Asia Regional Consultation Workshop on the Implementation of the Voluntary
Guidelines for Securing Sustainable Small-Scale Fisheries
in the Context of Food Security and Poverty Eradication**

*Ramada Bintang Bali Resort, Indonesia
24-27 August 2015*

The South East Asia Regional Consultation Workshop on the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication was held in Bali, Indonesia, on 24-27 August 2015. It was co-organized by the Ministry of Marine Affairs and Fisheries (MMAF) of the Republic of Indonesia and the Food and Agriculture Organization of the United Nations (FAO) in collaboration with the Southeast Asian Fisheries Development Center (SEAFDEC) and the FAO Bay of Bengal Large Marine Ecosystem (BOBLME) Project. The workshop was attended by 116 participants including representatives of governments, regional and international organisations, fisher-folk organizations, Civil Society Organization (CSOs), NGOs, academia and other relevant actors.

The objectives of the workshop were to raise awareness and develop a draft South East Asian Regional Plan of Action to support the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) in the South East Asia region. During 3.5 days, participants examined the current status of small-scale fisheries in the region, shared experiences through country and topical presentations, and discussed elements of a regional plan of action to support the implementation of the SSF Guidelines.

Across the region, small-scale fisheries contribute to livelihoods, food security, and local and regional economies. In most countries, the majority of fishers and fish workers are employed in the small-scale fishery sub-sector.

There is significant diversity amongst the small-scale fisheries of the region in terms the activity and context, but there are also some common characteristics. Small-scale fisheries are typically characterized by open access, low level of empowerment and general lack of organizational structures and formal representation in decision-making processes. Small-scale fisheries also typically involve rather complex livelihood strategies combining fishing and other activities.

Threats to small-scale fisheries include declining resources, habitat degradation, IUU fishing, post-harvest quality issues, increasing competition for access to resources and fishing areas between small-scale fisheries and commercial fisheries and other sectors, high levels of poverty and vulnerability to natural hazards and climate change and low levels of formal representation.

A vision for the implementation of the SSF guidelines

Based on the focus of the Regional consultative workshop and its discussions, a vision for the future was proposed:

“Resource management, rights, social and economic constraints are addressed through the implementation of the SSF guidelines, leading to increased empowerment, improved livelihood and food security and increased resilience of small-scale fisheries and those people which depend upon them”

Ensuring that the implementation of the SSF guidelines receives adequate political and policy support

Promotion of a South East Asian Regional Plan of Action for implementation of the SSF guidelines, to be led by Indonesia and coordinated by SEAFDEC:

- The workshop appreciated the Government of Indonesia's initiative to develop its National Plan of Action for Small-Scale Fisheries, and for taking a leading role in the region in promoting the implementation of the SSF Guidelines.
- The workshop further welcomed the commitment by SEAFDEC, to support the development and implementation of a South East Asian Regional Plan of Action for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication, for subsequent introduction to ASEAN for consideration (see Appendix 2).

The workshop identified the need for additional activities:

- Further consultations addressing specific issues, to inform and guide national and regional implementation planning
- National programmes for awareness raising and mainstreaming of the SSF Guidelines into policies and actions at all levels (following the example set by Indonesia)
- Pro-active partnership and cooperation with relevant non-fisheries institutions and organizations, including National Commissions for Human Rights, to resolve small-scale fisheries issues relating to labour, social development, rights and tenure, which may not lie within the direct area of competence of fisheries agencies or Agriculture Ministries
- Soliciting support for the implementation of the SSF Guidelines by national and regional partners and projects. Encourage recognition and incorporation of the SSF Guidelines implementation priorities into future and, to the extent possible, current regional projects and initiatives, (as exemplified by the BOBLME Strategic Action Programme, SAP)

Overarching objectives of a Regional Action Plan

- Regional and national government policy commitment to promote a national plan of action for the implementation for the SSF Guidelines
- Sustainable and equitable management of small-scale fisheries and access of SSF products to markets
- Small-scale fishers and their communities are empowered to participate in and benefit from sustainable development associated with the fisheries and resources upon which they depend
- Improved livelihoods and working conditions of small-scale fishing communities
- Gender considerations are mainstreamed as an integral part of SSF development strategies
- Reduced vulnerability to natural hazards, climate variability and climate change, and increase climate resilience

Approach and guiding principles of a Regional Action Plan

The workshop acknowledged the importance of all principles of the SSF Guidelines for the region and that these must guide implementation.

The workshop acknowledged that the comprehensive nature of the SSF Guidelines requires a holistic and human rights-based approach to small-scale fisheries governance and development. It was further recognized actions must take regional, national and local characteristics into consideration and be inclusive of all stakeholders. This includes the mainstreaming of gender considerations in implementation.

The workshop recognised that the implementation of the SSF Guidelines should be anchored at the local and national level, but that regional attention and support would also be required to address shared concerns and transboundary issues.

The workshop emphasized the role of governments in the implementation of the SSF Guidelines as well as regional and local fisheries organizations, communities and private sector, to ensure ownership of the SSF Guidelines. The workshop called upon these stakeholders to be pro-active in the implementation of the SSF Guidelines. This implementation should take place in the same inclusive and consultative spirit, which characterised the SSF Guidelines development process.

The workshop recommended that implementation of the SSF guidelines would require the initiation of new actions, but would also build on the existing experiences, good practices and processes supporting small-scale fisheries in the region, some of which have been identified during the workshop.

Principle areas for action identified by the working groups

The identified objectives and actions which emerged from the working groups are presented in the tables in the annex to this document. Potential priority areas for actions to be considered further in national and regional implementation planning processes proposed by the workshop are based on the following three thematic areas, which follow Part 2 of the SSF Guidelines. The full list of objectives and actions is presented in Appendix 3.

Governance of tenure in SSF and resources management (chapter 5 of SSF Guidelines)

The workshop identified six possible priority areas for SSF Guidelines implementation:

- Improve current arrangements for access to fishery resources for SSF. Existing zoning systems giving exclusive access for SSF in coastal and inland waters need strengthening and enhanced systems of user and access rights considered.
- Review existing tenure rights systems (for fisheries and land) to protect SSF including legalizing or recognizing customary tenure systems of indigenous peoples, to ensure access to resources including to coastal/waterfront areas as well as inland waters.
- Follow an ecosystem approach to fisheries (EAF) and apply a human rights based approach (HRBA) to achieve sustainable, productive use, healthy ecosystems and improved well-being of fishing communities. A change of attitude will be needed from seeing SSF as recipients to rights holders and processes should include consultations, capacity development and empowerment at regional and national levels.
- Ensure equitable participation of SSF in co-management and other initiatives and frameworks (such as ICZM and Blue Economy and MPA development). Fisheries advisory bodies need to be established including SSF representation.
- Ensure that appropriate fora, including regional human rights and legal mechanisms, exist to address transboundary issues, including in relation to transboundary resources and migrants and migratory fishers and fish workers.
- Include SSF – and not only fisheries in general – in national and regional climate change adaptation and disaster risk management legislation, strategies and plans. Early warning systems, vulnerability assessments, disaster related social security and insurance systems and other arrangements should be adapted to cater for SSF.

Social development, employment and decent work and gender equality (chapter 6+8 of SSF Guidelines)

The workshop identified six possible priority areas for action in relation to this theme, which also considered the issue of climate change and disaster risk and gender:

- Empower small-scale fishing communities through an integrated ecosystem / holistic approach for small-scale fisheries development. The establishment of national platforms representing all related stakeholders to support the SSF Guidelines implementation in a participatory manner (as indicated in particular in para. 13.4, 13.5 and 10.1 of the SSF Guidelines) and the promotion of inter-departmental collaboration within each country outside the fishery department are key in this context. This includes the incorporation of the SSF Guidelines into the agenda of the ASEAN Ministerial level on Agriculture and Forestry (AMAF). This process could be supported by thematic research on SSF by AICHR/ASEAN, a mapping of ongoing related initiatives and sharing about current empowerment conditions in the region.
- Address tensions generated by transboundary and transborder issues to support an environment for small-scale fisheries communities that have decent work and living conditions. This would require in particular collaboration between Ministry of Foreign Affairs, Ministry of Labour and Fisheries Department as well as a better understanding of issues in relation to transborder/boundary issues at local level (e.g. on risks of IUU fishing, migration for labour) and to seek humanitarian and responsible solutions.
- Enable access to education for all to achieve informed and educated coastal communities. Study visits at the regional level, the participatory development of curricula and the exploration of new technology for education could be supportive in this context.

- Improve living and working conditions and social protection in small-scale fisheries to contribute to ensuring decent work in the region. This should be based on ILO guidance and good practices, in particular in relation to migrant labour and work in fishing. The sharing of experiences in relation to national social protection schemes in this context could support change in the region.
- Actively promote and realize gender equality and equity in small-scale fisheries through the development and implementation of gender-sensitive legal, regulatory and policy frameworks. This could be supported among other through targeted programs and the gathering and sharing of best practices on women empowerment, also through social media and cultural campaigns.
- Ensure effective climate change adaptation, emergency response and disaster risk management in small-scale fisheries by including fisheries and fishing communities, including indigenous people, in related national policies and plans at all levels. At the regional level, the ASEAN Declaration on Climate Change and Resilience should be taken into account in this context and pilot projects should be initiated at national level to learn and inform a regional programme

Value chains, post-harvest and trade (chapter 7 of the SSF Guidelines)

The workshop identified the following five priorities under this theme

- SSF meeting local food security and human development needs, participate as partners in domestic, regional and global value chains and get a fair share of the benefits: Proposed actions include conducting SSF value chain assessments and risk analysis, market analysis, improvement of traditional value-added products and promotion of SSF products and inclusion in traceability systems
- Reduction of fish losses and ensure quality of the product to increase fishers' income and support sustainable fisheries management: Proposed actions include regional assessment on sustainable fish catch and processing capacity and most critical fisheries, potential causes of fish losses, promoting best practices for handling and distribution and establishment of a regional platform to promote exchange of experiences among SSF.
- Develop a conducive policy and business environment to encourage investment in infrastructure appropriate to SSF: Proposed actions include identifying best policies for facilitating investment in infrastructure, establishment of regional and national organization for fishing port managers, capacity development for the maintenance and management of landing site/fishing ports and SSF business skills, and encouraging innovation in the appropriate technology on infrastructure for SSF.
- Establish transparent market information systems for local and international market and trade, facilitate networking between SSF and end users, and promote better access to information through suitable ICT: Proposed actions include identification of information needs of all players in the supply chain, ensuring regional scalability and compatibility of ICT, providing up-to-date and transparent market price information system, and establishment of fishers market.
- Organize SSF associations, facilitate their evolution and strengthening to encourage fair and inclusive environment, improve their bargaining positions through an inclusive legal framework, and promote community-based resource management combining local wisdom and scientific knowledge: Proposed actions include creating and strengthening fishing associations and empowering them to get involved in resources management and capacity building, empowering regional EAFM working group to support SSF, and conducting regional review on how traditional systems have evolved and adapted.

Immediate next steps to follow-up to the regional workshop

The follow-up actions identified by the workshop to progress the Regional Action Plan and further promote implementation of the SSF Guidelines have been clustered thematically according to the structure of Part 3 of the SSF Guidelines.

Policy coherence, institutional collaboration and coordination

- Identify key partners at national and regional levels (NGOs, privates, other government departments), including indigenous peoples and NHRCs.
- Map regional projects/initiatives to explore synergies and opportunities for SSF Guidelines implementation (*e.g.* BOBLME, ATSEA II & the ISLME, which already include references to the SSF Guidelines).

Information, research and communication

- Each participant should bring back the learning from this workshop to colleagues
- Support lobbying at national level with the government to implement the SSF Guidelines
- SSF Guidelines should be translated into national languages (simple version).
- Develop mechanisms for alternative reporting (CSO/non-governmental) on how the SSF Guidelines can support the improvement of SSF
- Select one to two major market and trade activities at regional level (*e.g.* assessment of value chain of SSF; organization of a regional event to promote SSF products)
- National and local level workshop organised to raise awareness on SSF Guidelines (including fishers, local and national governments, partners – *e.g.* ICSF).
- Raise awareness on SSF Guidelines by Mangrove For the Future (MFF) through steering committee and national coordinating bodies

Capacity development

- Understand needs and support capacity building at national level targeting public institutions
- Provide support to CSOs/fisheries organizations who have supported the SSF Guidelines development/are following up on their implementation on the ground, including sharing of best practice between SSF groups
- Strengthen small-scale fishers organizations
- FAO to support development of guidance on implementation of the SSF Guidelines (in partnership with thematic experts/countries), and specific thematic SSF issues

Implementation support and monitoring

- Prepare zero draft of Regional Action Plan and organize a SEAFDEC Regional Technical Consultation to discuss the zero draft (for subsequent introduction into the ASEAN mechanism)
- Initiate national processes to develop NPOA for SSF for each country (*e.g.* example from Indonesia) by sharing the results of the regional workshop with all relevant stakeholders (*e.g.* in Thailand)
- Identify SSF ‘hotspots’ (most numerous, most dependent, most vulnerable, most poor, women, indigenous people etc.) and develop pilot activities at sub national level to demonstrate change through the application of the SSF Guidelines (requires criteria on identifying hotspots and financial support for piloting)
- Organize virtual working groups to work on specific topic and define outcome
- Create channel to report progress on implementation to relevant regional institutions
- Report progress on SSF implementation to the FAO Committee on Fisheries in 2016
- Aim for a comprehensive review of the implementation of the SSF Guidelines in five years
- BOBLME, subject to a second phase, should support the further development of an RPOA for implementation SSF Guidelines.

The workshop extended its gratitude to the Ministry of Marine Affairs and Fisheries (MMAF) of the Government of the Republic of Indonesia for hosting the workshop.

Bali, Indonesia, 27 August 2015

Next Steps for Developing a Southeast Asia RPOA-SSF

Actions	Timeline	Responsibility
Finalized Zero draft of the RPOA-SSF from Bali Workshop	By end of September 2015	Organizer's TEAM
Address the RPOA-SSF at the 18 th Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP)	26-27 November 2015 (Dusit-Thani, Manila, the Philippines)	SEAFDEC in collaboration with ASEAN Lead Country-Indonesia
Regional Technical Consultation on RPOA-SSF (finalize the 1 st draft based on the zero draft RPOA-SSF)	16-18 February 2016 (Venue will be considered)	SEAFDEC, Government of Indonesia, FAO, BOBLME, and other partners
Progress the 1 st draft at The 48 th Meeting of SEAFDEC Council for endorsement	4-7 April 2016 (TBA, Viet Nam)	SEAFDEC with the support from Indonesia and partners
Progress the endorsed RPOA-SSF from 48CM to the 18 th Meeting of the ASEAN-Sectoral Working Group on Fisheries (ASWGFi) for support and further consideration and adoption by the SOM-AMAF	June 2016 (TBA, the Philippines)	SEAFDEC and Indonesia
Submit the Final RPOA-SSF to SOM-AMAF for consideration and adoption	August 2016 (Venue TBA)	ASEAN-SEC and Indonesia

Issue	Vision/Objective	Good practice and ongoing initiatives	Proposed actions
Group 1 – Governance of tenure and sustainable fisheries management			
Access to fishery resources	<ul style="list-style-type: none"> - Zoning - User rights/right based system for SSF are included in legal frameworks 	<ul style="list-style-type: none"> - CAM: Boundaries for management areas are clearly defined in participation with resource users and local government (co-management). - INA: Panglima Laut – building on traditional fisheries management systems/zones. Zoning 12 miles SSF, under provincial management. - Zoning: <ul style="list-style-type: none"> • PHI: SSF (= < 3GT) can fish anywhere and municipal waters (15 km) exclusive for SSF (except for no-take MPAs). Local government unit can make municipal ordinances regarding coastal water (and exclude external fishers). • THA: 6 miles only for SSF – no ‘commercial’ fishers. MYA: 10 miles for < 30 feet boats but need licence. • VIE: zone ..miles for 90CV (SSF) • MAL: 5 zones, including 5 miles for SSF. - Registration (ID cards) of fisheries (PHI, INA, MYA). 	<p>REGIONAL</p> <ul style="list-style-type: none"> - Definition in SEAFDEC Regional CCRF (Code of Conduct for Responsible Fisheries) – revisit? - Strengthen fisheries at ASEAN level. - Make the ASEAN fisheries sectoral WG aware of the SSF Guidelines. <p>NATIONAL</p> <ul style="list-style-type: none"> - Definition of small-scale fisheries - Develop and strengthen existing SSF fishing zones with regard to: <ul style="list-style-type: none"> • Legal recognition; • Enforcement/MCS; • Awareness/information. <p>Responsibility: DOF or local gov’t (depending on decentralisation) in partnership.</p> <p>Demarcation of fishing zones / Cfi boundaries (CAM) Create limited access zones that are enforced Include SSF fishing areas in national and provincial spatial planning (INA)</p>
User/tenure rights (fisheries and land) for SSF:	<ul style="list-style-type: none"> - User/tenure rights for SSF are included in legal frameworks - Securing rights for indigenous peoples and other local communities 	<ul style="list-style-type: none"> - Panglima Laut in INA institutionalised (in Aceh, Lombok), supported by provincial laws – recognised by ‘proper law’. - Some other examples of recognition of traditional law but at local level. 	<p>REGIONAL</p> <ul style="list-style-type: none"> - Exchange of experiences on securing land tenure and access to beaches/waterfront (marine and inland waters) for SSF among SE Asia countries. <p>NATIONAL</p>

Issue	Vision/Objective	Good practice and ongoing initiatives	Proposed actions
	through legal frameworks	National level general recognition of traditional rights.	<ul style="list-style-type: none"> - Review of land tenure rights system and legalise customary rights to protect SSF and indigenous people from competition from other sectors (<i>e.g.</i> tourism) and access to beaches/waterfront (marine and inland water) should be public, as appropriate. - Responsibility: need to involve ministry/local government in charge of land.
Appropriate management systems for long-term conservation:	<ul style="list-style-type: none"> - HRBA to sustainable, productive and healthy ecosystems and improved well-being of fishing communities - Alternative livelihoods exist (switching to tourist activities) - Knowledge (scientific and traditional) based management 	<ul style="list-style-type: none"> - Promotion of EAF (MAL, INA, PHI, VIE), including capacity building of fishers, officials and academics. Adopted for FM in INA, including use of EAF indicators. In VIE EAF support to provincial level including MPAs and LMMAs. MPAs in CAM with multiannual planning. - In PHI, MPA management include fishers. - Programmes in PHI: PPPs, training capacity building for alternative livelihoods, scholarships for fisher children. - In THA, EAF capacity strengthening. - VMS (vessel monitoring system) – still starting in MYA. 	<p>REGIONAL</p> <ul style="list-style-type: none"> - Capacity building of regional partners (organisations and projects, <i>e.g.</i> PEMSEA and CTI). - Incorporate in regular training courses (by MFF, BOBLME, AIT). <p>NATIONAL</p> <ul style="list-style-type: none"> - Follow EAF for fisheries management planning and implementation, <i>e.g.</i> consultation with fishers on and information / communication. - Incentives/compensation to fishers who are directly displaced by coastal development/resource protection. - Capacity development on different topics, including HRBA: <ul style="list-style-type: none"> • For fishers to enable them to apply self-regulation) • For change agents (local government, NGO, government) - Changing attitude of governments from seeing SSF as a recipient to a right holder. - Partner with new (non fisheries) partners, <i>e.g.</i>, Human Rights Commission to ensure HRBA. - EAFM and HRBA training should be promoted and incorporated as part of existing and new courses (fisheries and related education). - Establish inter-ministerial task forces/committees to address SSF issues. - Establish a SSF desk/branch in DOF. - Monitoring, Controlling and Surveillance (MCS).
Co-management, consultations and representation:	<ul style="list-style-type: none"> - Consultation processes at national and regional levels in place 	<ul style="list-style-type: none"> - Areas of self-regulation (THA) - Co-management legally recognised in some areas of MYA. 	<p>NATIONAL</p> <ul style="list-style-type: none"> - Ensure that SSF is given appropriate importance in any ICZM arrangement and other frameworks, <i>e.g.</i> Blue Economy.

Issue	Vision/Objective	Good practice and ongoing initiatives	Proposed actions
	<p>established</p> <ul style="list-style-type: none"> - Equitable participation of SSF actors in co-management (not top down only) 	<ul style="list-style-type: none"> - Co-management can be established if communities want (Cfi) in CAM – for both marine and inland waters. - Legal basis for co-management in VIE (but lack of awareness among SSF). - Institutional development from local to national level (capacity building) in MYA. - 1800 locally managed MPAs and network in PHI. - FARMC (Fishery and Aquatic Resources Management Councils) in PHI, local councils including fishers and other stakeholders. 	<ul style="list-style-type: none"> - Establish fisheries advisory bodies including SSF representation at local and national level (refer Philippines FARMC).
Transboundary issues (at national and regional contexts):	<ul style="list-style-type: none"> - Appropriate fora, including regional human rights and legal mechanisms, exist to resolve internal and external issues, including issues relating to transboundary resources and migrants and migratory fishers and fish workers (HRBA). 	<ul style="list-style-type: none"> - CTI (coral triangle initiatives) – institutional structure. - BOBLME and other projects. - ASEAN sectoral WG on fisheries - Fishing agreement with INA-AUS. - Tolerance of SSF in INA – MAL: bilateral agreements. - In CAM, agreements with THA and VIE on how to manage SSF in some provinces. - CSO organisation at regional level. - Sharing of tools and guidelines in CTI region. 	<p>REGIONAL</p> <ul style="list-style-type: none"> - Promote bilateral agreements to solve transboundary issues among countries in the region. - Make the ASEAN fisheries sectoral WG aware of the SSF Guidelines. <p>NATIONAL</p> <ul style="list-style-type: none"> - Enhance coordination among ministries (and LGUs for Phil) at national level.
Assistance and support to SSF affected by CC and DR			<p>REGIONAL</p> <ul style="list-style-type: none"> - Establish arrangements for regional collaboration on CCA and DRM. - Incorporate SSF in ASEAN Coordinating Centre for Humanitarian Assistance (Jakarta) and Asian Disaster Preparedness Centre (Bangkok). <p>NATIONAL</p> <ul style="list-style-type: none"> - Include SSF specifically in national DR legislation and in

Issue	Vision/Objective	Good practice and ongoing initiatives	Proposed actions
			CCA plans/programmes. <ul style="list-style-type: none"> - Develop assessments specific to SSF for CC and include SSF as specific part of CC plans/programmes (not only fisheries). - Develop alternative income generating activities. - Longer time frame for weather forecast linked to early warning adequate for SSF. - Carry out vulnerability assessment for SSF. - Social security/insurance for CC & DR for SSF.
Group 2 – Social Development, Employment and Decent Work and Gender Equality and Disaster Risks and Climate Change			
Lack of empowerment of SSF communities at all levels	Integrated ecosystemic holistic approach for small-scale fisheries development	<ul style="list-style-type: none"> - Community-based/collaborative management + meaningful participation in decision making - Responsible/sustainable investment in social infrastructure in coastal areas - Collaboration with Ministry of Communication on the use of Information and Communication Technology for SSF (Indonesia- MoU to supply mobile phones to share information on prices, fishing grounds etc.) - Financial inclusion through the use of mobile phones for social transfers (India) - Commercial banks encouraged to cover remote areas (India) - Corporate Social Responsibility schemes designed with full involvement of SSF communities/based on needs of SSF community (e.g. India - use of old cables from underwater cable industry for fish cages) - Public-private partnership at local level for fish marketing (Philippines) - Indonesia- NPOA SSF included a 	REGIONAL <ul style="list-style-type: none"> - Sharing about empowerment conditions within SEA countries for further national action (applies to all issues) to learn and to develop baseline/indicators/gap analysis for the region - Develop guidance on implementation (FAO) - Promote the endorsement of the SSF Guidelines by ASEAN and other relevant regional associations - Promote the engagement with other relevant ASEAN bodies to consider the SSF Guidelines - Mapping of projects/initiatives relevant to the SSF Guidelines implementation in the region - Review current bilateral and regional agreements and examine how they align with the SSF Guidelines, and consider amendments and changes - Propose SSF as next thematic research issue for ASEAN Inter-governmental Commission on Human Rights (AICHR) NATIONAL <ul style="list-style-type: none"> - Promote the SSF Guidelines with the Ministry/Department of Agriculture in each country to bring them on agenda of ASEAN ministerial level on agriculture and forestry (AMAF) - Promote registration of SSF fishers and fish workers in close collaboration with the fishing communities, their organizations and NGOs - Promote inter-departmental collaboration within each country outside the fishery department - Establish national platforms representing all related

Issue	Vision/Objective	Good practice and ongoing initiatives	Proposed actions
		<ul style="list-style-type: none"> review of the legal and regulatory framework - Japan has support officers for coastal fisheries 	<ul style="list-style-type: none"> stakeholders to support the SSF Guidelines implementation in a participatory manner as indicated in particular in para. 13.4, 13.5 and 10.1 of the SSF Guidelines - Review current (fisheries) laws and regulations to examine how they align with the SSF Guidelines (example from Indonesia) <p>Strengthen extension services for SSF (example from Japan)</p>
Tensions generated by transborder /boundary issues	Environment for small-scale fisheries communities free of crimes	<ul style="list-style-type: none"> - Bilateral agreements to not detain small-scale fisheries in foreign EEZ (e.g. Indonesia-Malaysia) - Promotion of transition from informal to formal migration as collaboration between Ministries of Labour, Foreign Affairs and Fisheries (e.g. Philippines, Myanmar - pre-departure training for the merchant marine sector) - Register of seafarers as already established for the merchant fleet sector 	<p>REGIONAL</p> <ul style="list-style-type: none"> - Identify migration hotspots - Encourage bilateral agreements for appropriate handling of SSF (e.g. through MoUs) in relation to transborder/boundary issue <p>NATIONAL</p> <ul style="list-style-type: none"> - Encourage collaboration between Ministry of Foreign Affairs, Ministry of Labour and Fisheries Department - Increase awareness of and understanding of issues in relation to transborder/boundary issues at local level (e.g. on risks of IUU fishing, migration for labour) - Examine establishment of safe passage for customary movement between countries
Limited or lack of access to education for all	Informed and educated coastal communities	<ul style="list-style-type: none"> - Schools and teachers provided to coastal communities by Civil Society Organizations (e.g. Philippines) - Floating schools in inland and marine areas (e.g. Cambodia, Viet Nam) - Quota of scholarships for students from fishing communities to access public university specialized in fisheries (Indonesia) - Development of context-specific curriculum for primary/secondary school for coastal communities (Thailand) - Indonesia and Rhode Island University have an MoU 	<p>REGIONAL</p> <ul style="list-style-type: none"> - Arrange study visits in the region, including to Japan, facilitated through organizations such as SEAFDEC - Promote discussion in ASEAN on investment mechanism for education infrastructure and partnerships to enable this - Promote regional basic literature programs for SSF <p>NATIONAL</p> <ul style="list-style-type: none"> - Provide training for women in fish processing and marketing (hands on training) - Youth: provide support for education fee, scholarships, university exchange programs (e.g. example from Indonesia) - Develop specific curricula based on SSF needs, in consultation with SSF stakeholders - Promote increased investment in social infrastructure for SSF

Issue	Vision/Objective	Good practice and ongoing initiatives	Proposed actions
<p>Poor working conditions in small-scale fisheries and lack of social protection</p>	<p>Decent work for all is operative in the region</p>	<ul style="list-style-type: none"> - Malaysia has a social protection for SSF - Indonesia has an insurance scheme for fisheries 	<p>communities</p> <ul style="list-style-type: none"> - Explore the use of new technology for education <p>REGIONAL</p> <ul style="list-style-type: none"> - Promote implementation of ILO guidance, including recent regional work on migrant labor (<i>e.g.</i> establishment of seafarer register), in line with ASEAN Declaration on the Rights and Protection of migrant workers - Promote regional agreement on social protection/security for migrant labour - Share experiences from national social protection schemes to encourage establishment/strengthening of national schemes - Establish formal complaints mechanism (example from ILO on forced labour) <p>NATIONAL</p> <ul style="list-style-type: none"> - Establish register of fishers and fishworkers - Establish pre-migration training programs <p>Establish/strengthen health and safety insurance mechanisms for all SSF, including migrants</p>
<p>Need for gender-sensitive legal, regulatory and policy framework and its implementation</p>	<p>Active promotions and realization of gender equality and equity in SSF</p>	<ul style="list-style-type: none"> - Malaysia has ‘women in business’ groups, including for fisheries - Philippines have guidelines on the recognition of women in agriculture which could be adapted to SSF - Indonesia has empowerment programs targeting SSF women 	<p>REGIONAL</p> <ul style="list-style-type: none"> - Ensure the participation of SSF women in the ASEAN Commission on women and children - Gather and share best practices on women empowerment, also through social media and cultural campaigns <p>NATIONAL</p> <ul style="list-style-type: none"> - Develops specific plan for women in SSF and ensure allocation of budget for women programs - Promote SSF women groups (for example, Women in Business groups in Malaysia) - Develop national guidelines for the recognition of SSF women (example for rural women recognition available from the Philippines) - Gather and share best practices on women empowerment, also through social media and cultural campaigns - Develop/strengthen legislation to ensure the realization of

Issue	Vision/Objective	Good practice and ongoing initiatives	Proposed actions
Emergency response and disaster risk management not including SSF enough	Inclusion of fisheries and fishing communities and indigenous people in inland and coastal areas in national policy and plans at all level	<ul style="list-style-type: none"> - ASEAN Declaration on Climate Change and Resilience - Sectoral plan/strategy for climate change adaptation for the fisheries sector (Indonesia) 	<p>women's rights</p> <p>REGIONAL</p> <ul style="list-style-type: none"> - Discussion and monitoring of the implementation of the ASEAN Declaration on Climate Change and Resilience, ensuring the inclusion of SSF <p>NATIONAL</p> <ul style="list-style-type: none"> - Actively involve SSF stakeholders in the development and implementation of national plans for CC adaptation and disaster risk to integrate natural resource management and SSF (ecosystem approach; example from Indonesia on sectoral CC adaptation strategy) - Pilot projects at field level and share learning to inform a regional CC adaptation program
Group 3 - Value Chains, Post-harvest and Trade			
Access to markets	SSF meet local food security needs, participate as partners in domestic and global value chains and get a fair share of the benefits	<p>Ongoing:</p> <ul style="list-style-type: none"> - Fish Auction practices at the landing site - Fishing/fishers cooperative and fishing guilds - Promote the SSF products to the International market - Market certification for SSF products - FIP for SSF - Joint promotion of SSF products among Asia - Pacific countries - Centralized Landing for the SSF <p>Good practices:</p> <ul style="list-style-type: none"> - Direct link between SSF to the retailers - Clustering the SSF in to the Plasma scheme - Seafood festival to bring the consumers directly in to the SSF - Promoting sustainable product from SSF to the market including consumers education 	<p>Regional:</p> <ul style="list-style-type: none"> - Assessment of the small-scale fisheries value chain - Market analysis at regional level to look at the demand trend for fisheries product - Promotion for SSF products at the regional market - Assessment of the impact of ASEAN Economic Community and trade barriers on SSF <p>National:</p> <ul style="list-style-type: none"> - Assessment of the small-scale fisheries value chain and risk analysis on impacts on local food security - Improvement of value-added traditional products such as: Fish sauce, Smoked Fish, Fish Crackers, Fish floss, Fish Balls, souvenirs, etc. - Facilitate market access for traditional product to the retailers - Monitoring of fish prices and supply

Issue	Vision/Objective	Good practice and ongoing initiatives	Proposed actions
Avoiding post-harvest losses	Reduce fish losses and ensure quality of the product to increase fishers' income and support sustainable fisheries management	Ongoing: <ul style="list-style-type: none"> - The improvement of on board preservation - Capacity building for fishers and other players along the value chain for good handling practices on board and distribution - Provide collecting vessels for SSF at sea. - Improvement of traditional processing practices and diversification - Inspection systems for the catches quality and safety at the landing site Good practice: <ul style="list-style-type: none"> - Good cool chain system along the supply chain 	Regional: <ul style="list-style-type: none"> - Regional assesment on the sustainable fish catch and processing capacity - Identify potential causes of fish losses along the supply chain for SSF - Promote best practices for handling and distribution <i>e.g.</i>: standardized fish box - Establish a platform to promote exchange of experiences among SSF in Asean National: <ul style="list-style-type: none"> - Promote best practices for handling and distribution <i>e.g.</i>: standardized fish box - Identify the most critical fisheries in terms of sustainability, loss and waste to establish measures
Investment in appropriate infrastructure	Conducive policy and business environment to encourage investment in infrastructure appropriate to SSF	Ongoing: <ul style="list-style-type: none"> - Partnership with the private sectors in providing better facilities for SSF - Sekaya Maritim Program (Indonesia) - Improvement of landing sites for SSF - Encourage private sectors to invest in infrastructures for SSF - Investment in transition from destructive to more selective fishing gears Good practices: <ul style="list-style-type: none"> - Providing one stop services systems including logistics and license for SSF 	Regional: <ul style="list-style-type: none"> - Case study at regional level to identify best policies for facilitating investment in infrastructure for SSF - Establish regional organization for fishing port managers National: <ul style="list-style-type: none"> - Capacity development for the maintenance and management of landing site/fishing port - Capacity building for SSF business skills - Establish national organization for fishing port and landing site managers <i>e.g.</i> such as in Indonesia - Encourage innovation in the appropriate technology on infrastructure for SSF
Access to information on market and trade	Establish transparent market information systems for local and international market and trade, facilitate networking between SSF and end users, and promote better access to information	Ongoing: <ul style="list-style-type: none"> - www.pipp.com and information board in some landing sites. - www.wpi.kkp.go.id for the fish price information. - Online catch certification system 	Regional: <ul style="list-style-type: none"> - Identify the need for information of players along the supply chain including market requirements - Ensure regional scalability and compatibility for information and communication technology <i>e.g.</i> should be available in different ASEAN languages

Issue	Vision/Objective	Good practice and ongoing initiatives	Proposed actions
	through suitable ICT	<ul style="list-style-type: none"> - SMS for market and fishing related information 	National: <ul style="list-style-type: none"> - Establish fishers market for SSF, like in Malaysia - Establish up-to-date and transparent market price information - Identify the need of information of players along the supply chain including market requirements
Traditional forms of associations	Organize SSF associations, facilitate their evolution and strengthening to encourage fair and inclusive environment, improve their bargaining positions through an inclusive legal framework, and promote community-based resource management combining local wisdom and scientific knowledge	<ul style="list-style-type: none"> - Transition to written contract between SSF and the middlemen - Develop fisher club to link with the buyers and encourage ecotourism - Fisher association provide Capacity building on sustainable fishing and business - Improve fisheries income (premium price) back to the community - Empowering customary law (<i>e.g.: adat & tara bandu</i>) Good practices: <ul style="list-style-type: none"> - <i>Van chai</i> (Viet Nam), <i>tara bandu</i> (Timor Leste), <i>Sasi & Panglima Laot</i> (Indonesia) - Revival and modernization of traditional fisheries management system (<i>e.g. Samoa</i>) 	Regional: <ul style="list-style-type: none"> - Empower regional EAFM working group to support the SSF - Creating and strengthening fishing associations and providing technical support and capacity building - Regional review of how traditional system have evolved and adapted to sustainable resources management and trade requirements National: <ul style="list-style-type: none"> - Empowering local fishing communities to get involved in resources management, capacity building and establish link with the market such as in Malaysia - Creating and strengthening fishing associations and providing technical support and capacity building

PREPARATION FOR SOUTHEAST ASIAN STATE OF FISHERIES AND AQUACULTURE (SEASOFIA) 2017

Background

Information on the status and trends of fisheries is widely recognized as crucial in serving as basis for sustainable development and management of fisheries. SEAFDEC throughout the past decades had undertaken several activities to compile various forms of fishery-related data and information, *e.g.* regional fishery statistics based on the national statistics data provided by the Southeast Asian countries, as well as other data and information from different SEAFDEC programs/projects. In order to ensure that the outputs from these initiatives could be integrated or digested into information that support the development and management for sustainable fisheries of the region, SEAFDEC in 2010 undertook a pilot exercise in developing the publication on “The Southeast Asian State of Fisheries and Aquaculture” or “SEASOFIA”. Such endeavor was meant to provide platform for compilation of synthesized data and information generated from various programs of activities, while incorporating other data and information available in the region, in order to provide better understanding on the status and trends of fisheries and aquaculture of the region. The first SEASOFIA was published in 2012.

While taking into consideration the usefulness of the SEASOFIA especially as a tool in providing a platform for integrating regional data and information and in coming up with information to support policy planning and management of fisheries, the SEAFDEC Council during its 44th Meeting agreed that the SEASOFIA could be published on a regular basis, *i.e.* every 5 years. It was also suggested that future production of the publication should be done in close coordination with other agencies that produce similar publications in order to avoid possible redundancies of the contents. Specifically, the SEASOFIA could focus on the analysis of the specificity of fisheries in the Southeast Asian region and could include the reasons behind the changing trends of fishery production in respective Southeast Asian countries. An analysis of the respective countries’ policy directions and management policies, as well as of over-exploitation or under-exploitation of stocks should also be included in the publication. In order to minimize production costs and enhance dissemination, the publication could be produced in electronic format, *e.g.* in CD-ROM format or make the publication accessible through the SEAFDEC website.

SEASOFIA 2017

In line with the directives given by the SEAFDEC Council, the Secretariat therefore plans to prepare the next SEASOFIA to be published in 2017. The following outline of SEASOFIA 2017 was proposed by SEAFDEC Secretariat and Departments:

Topic	Inputs	Contributor
Part I. Status and Trends of Capture Fisheries and Aquaculture in SEA		
1. Global Production and Utilization of Fish	Write-up on fishery production of the AMSs based on statistics data and analysis (from SEAFDEC Fishery Statistical Bulletin 2000-2014, FAO Yearbook 2000-2014, and other sources). Explanation would also be provided on changing trends of fishery production in respective Southeast Asian countries.	SEC/IPC Office ++
2. Fishery Production of SEA		
3. Production from Marine Capture Fisheries of SEA		
3.1 Economically Important Species		
3.1.1 Tunas		
3.1.2 Small Pelagic Species (<i>e.g.</i> scads, mackerels, anchovies, sardines, etc.)		
3.1.3 Crustaceans and Molluscs		
3.1.4 Demersal Fish Species		
3.2 By Types of Fishing Fleets		
4. Production from Inland Capture Fisheries of SEA		
5. Aquaculture Production of SEA		
5.1 Mariculture		

Topic	Inputs	Contributor
5.2 Brackishwater Culture 5.3 Freshwater Culture		
6. Fish Processing Industry * <i>Subject to contribution from MFRD</i>		
7. Fish Trade 7.1 Global Trading of Fish and Fishery Products 7.2 Southeast Asian Export-Import of Fish and Fishery Products		
8. Summary		
Part II. Issues and Challenges in Sustainable Fisheries Development of the Southeast Asian Region		
1. Marine Fishery Resources	Write-up on status, issues and anticipated challenges (from activities related to implementation of RPOA-Neritic Tunas, available national/regional statistics and other sources) This section covers both oceanic and neritic tunas. <i>TD – Status, trend, anticipated issues on oceanic tuna, with particular focus on Sula and Sulawesi Seas.</i>	SEC/PPC Office, TD
1.1 Important Pelagic Fishery Resources 1.1.1 Tunas		
1.1.2 Scads 1.1.3 Mackerels 1.1.4 Anchovies 1.1.5 Sardines	Write-up on status and trends, issues and anticipated challenges based on inputs from AMSs at relevant workshops, and available national/ regional statistics and other sources of information. Also included are future plans of activities toward management of these species.	MFRDMD (+ PPC Office)
1.2 Important Demersal Fishery Resources 1.2.1 Species as Raw Materials for Surimi	Write-up on status, issues and anticipated challenges on: 1) Species as raw materials for Surimi including the status of Surimi industry; and 2) Live Reef Food Fish species, particularly in the Sulu-Sulawesi sub-region.	PPC Office
1.2.2 Live Reef Food Fish Species		MFRDMD
1.3 Deep Sea/Offshore Fisheries Resources 1.3.1 Status and Trend	Write-up on status, issues and anticipated challenges related to exploitation of deep-sea and offshore fishery resources in the region, with special focus on the Sula and Sulawesi Seas.	TD
1.3.2 Deep sea shrimps		BFAR
1.3.3 Oceanic squids		PPC Office
1.4 Challenges and Future Direction	Summary of challenges and future direction (based on 1.1-1.3)	IPC and PPC Office
2. Inland Fishery Resources		
2.1 Status, Issues and Concerns 2.1.1 Inland Fisheries for Food Security and Poverty Alleviation	Write-up on overview of inland fisheries from the perspective of livelihood for the people in Southeast Asian region. This would specifically describe the contribution of inland fisheries to poverty alleviation, food security and nutritional supply through fishing activity, processing, commodity and consumption.	IFRDMD
2.1.2 Data/Information Collection on Inland Fisheries	Write-up on features, difficulties and possible alternative methods for collecting statistics on inland fishery in Southeastern Asian region.	IFRDMD
2.1.3 Extract of Priority Issues from Different Countries/Areas	Write-up on important priority issues in Southeast Asian region, which are extracted through the comparison of the	IFRDMD

Topic	Inputs	Contributor
	present status of inland fisheries among each region/country.	
2.1.4 Impacts of Water Barrier Construction on Inland Fisheries	Write-up on problems caused by artificial water barrier construction on habitat of aquatic organisms, fish migration and surrounding environment. Measures for mitigation would also be mentioned. <i>TD – Results from SEAFDEC project on development of fish passage models applicable for the SEA region</i>	IFRDMD and TD
2.1.5 Inland Fisheries vs. Aquaculture	Write-up on negative influences from flourishing of freshwater aquaculture on natural resources, such as overuse of water bodies, eutrophication from wasted nutrients and escaped species from fish farms.	IFRDMD
2.2 Challenges and Future Direction 2.2.1 Habitat Conservation	Write-up on the aims, needs and measures taken for conserving habitats of aquatic organisms to enhance fish stocks.	IFRDMD
2.2.2 Negative Effect of Freshwater Aquaculture	Write-up on the negative impacts of unregulated expansion of freshwater aquaculture on inland capture fisheries then propose the measures taken for appropriate use of inland waters.	IFRDMD
3. Species Under International Concern		
3.1 Sharks and Rays	Write-up on status, international-related issues related to utilization, conservation and management of sharks and rays, and existing measures undertaken by relevant AMSs. <i>TD – Recommendations for improving management of sharks, including implementation of the NPOA-sharks in the AMSs.</i>	MFRDMD, TD, PPC Office
3.2 Eels	Overview on global trends of eel production, species found in the region, and production/distribution in AMSs. Information will also be provided on important issues, e.g. current condition, degradation, catch trend, stock status, and recommendations for conservation and sustainable utilization of the species.	IFRDMD, PPC Office
3.3 Sea Turtles	Write-up on status, international-related issues related to utilization, conservation and management of the sea turtles, and existing measures undertaken by relevant AMSs.	MFRDMD
3.4 Sea Cucumbers	Write-up on status, international-related issues related to utilization, conservation and management of sea cucumbers, and existing measures undertaken by relevant AMSs. <i>AQD – Findings and regional updates on technologies developed for seed production, nursery and sea ranching.</i>	AQD, MFRDMD

Topic	Inputs	Contributor
3.5 Seahorses	<p>Write-up on status, international-related issues related to utilization, conservation and management of seahorses, and existing measures undertaken by relevant AMSs.</p> <p><i>AQD – Updated information on aquaculture-based enhancement and restoration initiatives in the Southeast Asian region. AQD’s inputs will include the technologies developed for seed production and nursery culture in cages, including the on-going initiatives aimed at developing release strategies.</i></p>	AQD, MFRDMD
3.6 Coral Reef Ornamental Species	<p>Write-up on status, international-related issues related to utilization, conservation and management of coral reef ornamental species, and existing measures undertaken by relevant AMSs.</p>	MFRDMD, TD, PPC Office
3.7 Challenges and Future Direction		MFRDMD
<p>4. Utilization of Fishery Resources</p> <p>4.1 Status, Issues and Concerns</p> <p><i>Sub-topics to be confirmed – subject to contribution from MFRD</i></p> <p>4.2 Challenges and Future Direction</p>	<p>Write-up on status, issues and anticipated challenges related to utilization of fishery resources in the Southeast Asian region.</p> <p><i>TD – status, issues and anticipated challenges related to onboard fish handling and fish handling technique applicable for various fishing operation in Southeast Asia.</i></p>	MFRD & TD (on post-harvest losses on-board)
<p>5. Fishery Management</p> <p>5.1 Management of Fishing Capacity and Combating IUU Fishing</p> <p>5.1.1 Stock Assessment</p> <p>5.1.2 Fishing Vessel Registration and Fishing Licensing</p> <p>5.1.3 Traceability of Capture Fisheries (including Certification)</p> <p>5.1.4 Port Monitoring and Port Inspection</p> <p>5.1.5 MCS Systems and Network</p> <p>5.1.6 Legal and Institutional Matters</p> <p>5.1.7 Transboundary Issues</p> <p>5.1.8 Other Management Measures (e.g. zoning, seasonal prohibition, etc.)</p>	<p>Write-up on current status of fishing capacity and combating IUU fishing in the region, initiatives related to management of fishing capacity and combating IUU fishing at the national and regional levels. Initiatives undertaken by SEAFDEC should also be included in boxes (i.e. ASEAN GL for prevention the entry of fish and fishery products from IUU fishing activities into the supply chain; Development of the RFVR; Catch Documentation/ Certification; Regional implementation of PSM; Regional MCS network; and Bilateral arrangements.</p> <p><i>TD – development and usage of RFVR database; and issues, constraints, and recommendation for implementation of PSM in the region</i></p>	MFRDMD, PPC Office, TD
5.2 Management of Inland Capture Fisheries	<p>Write up the present status of various fisheries management measures on inland fishery in Southeast Asian region, such as co-management, community-based management and right-based fisheries.</p> <p><i>MFRDMD -- To consider whether management of fishing capacity for inland fisheries could be included.</i></p>	IFRDMD (and MFRDMD)

Topic	Inputs	Contributor
5.3 Responsible Fishing Practices 5.3.1 By Catch Reduction and Management	Write up on status, issues and anticipated challenges related to by catch reduction, management, and strategies for trawl fisheries in the region. With particular focus on the CTI sub-region.	TD
5.3.2 Optimizing Energy Use in Fisheries	Write up on status, issues and anticipated challenges related to optimizing energy use in fisheries	TD
5.3.3 Reducing the fossil fuel use and Carbon emission	Write up on status, issues and anticipated challenges related to the methods of reducing fossil fuel use and carbon emission from fishing activities.	TD
5.4 Community-based Fishery Management Approach in the SEA Region	Write-up on current status on the introduction and implementation of CBFM, co-management by the AMSs, including activities supported by various organizations; issues, challenges and opportunities related to fisheries management; and future direction and way forward for the region.	TD
5.5 Application of EAFM for Fisheries Management	Write-up on importance, concepts and application of EAFM for Fisheries Management through human capacity building on EAFM in the region.	TD, MFRDMD
5.6 Habitats Protection and Coastal Fishery Resources Enhancement	Write up on status, issues and anticipated challenges, <i>e.g.</i> status of fisheries habitats and initiatives on conservation/ enhancement, fisheries <i>refugia</i> , stock release, ARs, linkages between resource enhancement activities and integrated coastal fisheries management.	TD, MFRDMD (and AQD)
5.7 Challenges and Future Direction	Write-up on anticipated challenges related to fisheries management and way forward for the region	PPC Office, IPC Office, TD, MFRDMD
6. Aquaculture Development		
6.1 Control and Prevention of Present and Emerging Transboundary Aquatic Animal Diseases	Based on AQD project findings and literature review, the article will provide the overall picture of what is happening in the AMSs, the policy issues, and directions. Information will also be based on outcomes of the planned “ASEAN RTC on EMS and other Transboundary Diseases”, scheduled to be held in the Philippines in February 2016	AQD
6.2 Overcoming the Fish Meal Dependence in Aquaculture	This will report the recent findings of AQD on research related to protein source substitution in aquafeed formulation; status and directions in the region, based on outcomes of “RTC on Development and Use of Alternative Dietary Ingredients or Fish Meal Substitutes in Aquaculture Feed Formulation”, held in Myanmar in 2014.	AQD
6.3 Producing and Distributing Good Quality Seed	Write-up will provide the updated status, issues and directions on the production and dissemination aspects of quality seed in the Southeast Asian region.	AQD

Topic	Inputs	Contributor
6.4 Producing Safe and Quality Aquaculture Products	In view of the forthcoming ASEAN economic integration, the production of safe and quality aquaculture products has become increasingly important; this article will discuss the findings of studies conducted by AQD on food safety and other initiatives in the region	AQD
6.5 Addressing Environmental Concern Due to Intensification of Aquaculture and Climate Change	Intensification of aquaculture, impacts of climate change and their consequent effects in the environment are important challenges in the Southeast Asian region. This article will be an updated version of what was published in 2012 SEASOFIA.	AQD
7. Vulnerability of Fisheries to Climate Change	Status, issues and anticipated challenges related to climate change and fisheries	Secretariat
8. Fisherfolks, and Workers in Fishing Activities (on-board)		
8.1 Safety at sea, working condition and safety on-board of fishing vessels	Write up on status, issues and anticipated challenges related to safety at sea, working condition and safety on board of fishing vessels including standard of fishing vessels and crews in the Southeast Asian region.	TD, Secretariat
	<i>To decide whether workers in related industries, e.g. processing, and aquaculture, and gender issues should be included?</i>	
9. Human Resources in Fisheries	Summary result from the study on Human Resources in Fisheries being undertaken by RFPN Members	RFPN
Part III. Outlook of Fisheries and Aquaculture for the Southeast Asian Region		
1. Outlook of Fisheries and Aquaculture	Write up on anticipated fisheries-related issues that may arise in the future, and will impact on Southeast Asian fisheries development	PPC Office
2. Future Direction and Way Forward	Write-up on future direction of the region's fisheries	Secretariat

Publication Team

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- SEAFDEC Secretary-General and Chief of SEAFDEC/TD
- SEAFDEC Deputy Secretary-General and Deputy Chief of SEAFDEC/TD
- Chief of SEAFDEC/MFRD
- Chief of SEAFDEC/AQD
- Chief of SEAFDEC/MFRDMD
- Chief of SEAFDEC/IFRDMD
- SEAFDEC Senior Advisor

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- Information Program Coordinator, SEAFDEC Secretariat
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Contributors

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Workplan and Timeframe

Activity	2015			2016												2017			
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
• Discussion on proposed outline of SEASOFIA2017 at 16 th ISP Meeting																			
• Submit the proposed outline to 38 th PCM and DCM																			
• Preparation of inputs from contributors																			
• Submission of inputs from contributors to the Secretariat																			
• Harmonization of inputs																			
• Discussion among SEAFDEC staff on the draft content			Making use of existing SEAFDEC gathering and events, & extra events																
• Finalization of the draft content																			
• Circulation of the draft Member Countries through NC for comment																			
• Finalization of content and layout for publishing																			
• Publication available for the 49 th Council Meeting																			

Required consideration of the PCM

- 1) To provide comment on the proposed outline of the SEASOFIA 2017
- 2) To recommend on how to enhance countries' contribution to the publication

CLOSING REMARKS

By Mr. Hajime Kawamura
Acting SEAFDEC Secretary-General

Distinguished Members of the SEAFDEC Program Committee,
SEAFDEC Senior Officials,
Representatives from our Collaborating Partners,
Ladies and Gentlemen, Good Evening!

After what seems to be three long days of deliberations, we are now closing the Thirty-eighth Meeting of SEAFDEC Program Committee. On behalf of the SEAFDEC Secretariat and Departments, I would like to express our sincere gratitude to all of you for providing us with meaningful ideas, comments and suggestions on the various issues discussed, especially on the SEAFDEC Programs and activities. I would also like to reiterate our gratitude to the Aquaculture Department for making this Meeting possible here in Manila and the Meeting Secretariat for their hard work that made this Meeting successful.

As you are already aware of, the recommendations that we have just adopted especially with respect to the programs of SEAFDEC would be presented to the next Meeting of the FCG/ASSP which will be convened from tomorrow until Friday. The output of such Meeting would be subsequently presented to the forthcoming SEAFDEC Council Meeting for final endorsement and approval, and inclusion in the overall activities of SEAFDEC. We are therefore very thankful to all of you for providing us with significant advice and proper guidance leading to the achievement of the objectives of this Meeting.

Finally, Ladies and Gentlemen, while our meeting is coming to an end, please allow me to extend our wishes to those who will leave this beautiful city before the FCG/ASSP Meeting, for you to have safe journey back to your homes. For the others, I will see you during the FCG/ASSP Meeting from tomorrow until Friday. Finally, I wish you all the best and every 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 Thirty-eighth Meeting of the Program Committee closed.

Thank you.