

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

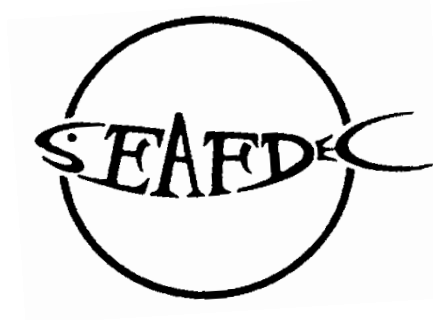
Ubon Ratchathani, Thailand  
1 - 3 December 2014



**THE SECRETARIAT  
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

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

**Ubon Ratchathani, Thailand  
1-3 December 2014**



**THE SECRETARIAT  
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

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

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

## **BIBLIOGRAPHIC CITATION**

SEAFDEC. 2015. Report of the Thirty-seventh Meeting of the Program Committee of the Southeast Asian Fisheries Development Center. Southeast Asian Fisheries Development Center, Thailand. 343 pp.

### **NOTICE OF COPYRIGHT**

This Publication may not be reproduced, in whole or in part, by any method process, without written permission from the copyright holder. Applications for such permission with a statement of the purpose and extent of the reproduction desired should be made through and addressed to:

SEAFDEC Secretariat  
Suraswadi Building,  
Kasetsart University Campus,  
P.O. Box 1046, Kasetsart Post Office,  
Bangkok 10903, Thailand.

All rights reserved

©SEAFDEC 2015

## EXECUTIVE SUMMARY

The Thirty-seventh Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Ubon Ratchathani, Thailand, from 1-3 December 2014 and hosted by the Training Department (TD). The Meeting reviewed the SEAFDEC programs implemented in 2014 and scrutinized the programs to be implemented in 2015 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 2014-2015 appears as *Appendix 1*. The Meeting was chaired by the 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 2014, which comprise the twenty (20) projects categorized under five Program Thrusts, namely: 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'. There were seven new FCG/ASSP Projects proposed for implementation starting from 2015. The Program Committee approved the programs, and provided recommendations which could be summarized as follows:

### *Program Thrust 1: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security*

#### **1. Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement**

- Member Countries should be involved more in site selection for the new phase of the project and on-site training based on cost-sharing scheme;
- SEAFDEC to consider documenting the results of this project and based on the results, fast-tracking of the development of a model for fishing ground rehabilitation that could be used by the countries; and
- In the end-of-project seminar to be organized back-to-back with the International Symposium on Resource Enhancement tentatively in June 2015 in Thailand, the outcomes and impacts of the project should be included in the final report and since many Southeast Asian countries have been conducting national programs on resources rehabilitation, relevant experiences of the countries should be compiled and exchanged during the seminar.

#### **2. Human Resources Development (HRD) Programs on Fisheries Management Approaches for Sustainable Fisheries**

- SEAFDEC/TD to consider developing the guidelines, toolkits on ecosystem approach for fisheries management (EAFM) for fisheries extension officers, and if appropriate conducting an impact assessment of the project implementation of the EAFM approach, and to make the results known to local communities;
- SEAFDEC/TD to consider extending the EAFM concept to Lao PDR and Myanmar through on-site training; and
- SEAFDEC to continue providing the concept for developing appropriate strategy for implementing on-site training on fisheries management based on ecosystem approach with the participating countries providing in-kind support for such training.

#### **3. Optimizing Energy Use/Improving Safety Onboard in Fishing Activities**

- SEAFDEC/TD to consider raising the awareness of stakeholders by disseminating relevant guidelines that made use as reference the lessons learned from affected areas in the Philippines as well as in other countries in the region;
- SEAFDEC/TD to consider developing a standard model for construction of appropriate fishing vessels using as reference the fishing boat designs developed by other fishing nations, e.g. Japan, Taiwan, South Korea;

- Member Countries that have not requested training activities under this project should consider requesting for such activities; and
- Japan to consider supporting such training courses including dispatch of Japanese experts.

**4. Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release**

- AQD to consider transferring the experiences and lessons learnt from the project, through a workshop and the report of which should be distributed to the Member Countries;
- AQD to assist Myanmar in improving the methodology adopted by the country in fish larvae production for some important fish species and mud crab in protected areas;
- AQD to consider intensifying its technology transfer activities on breeding of various commodities such as abalone, sea cucumber, and other economically important species to the Member Countries;
- AQD to consider accommodating technical staff from Malaysia to learn on the mass production of humphead wrasse, mud crab, and corals; and
- AQD to work towards becoming the first in the world to make a breakthrough in the resource enhancement of sea horse and Napoleon wrasse.

**5. Promotion of Sustainable and Region-oriented Aquaculture**

- AQD to provide assistance to Myanmar in the country's effort to conduct studies on the culture of species suitable for different climatic conditions.

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

**6. Chemical and Drug Residues in Fish and Fish Products in Southeast Asia “Biotxin Monitoring in ASEAN”: ASP, AZA and BTX**

- The need to address Harmful Algal Blooms (HABs) and biotoxins issues was recognized as some Southeast countries have faced increasing incidence of HABs in their waters.

**7. Traceability Systems for Aquaculture Products in the ASEAN Region**

- The on-line traceability system to facilitate trading of fish and fish products has already been developed by the private sector for commercial use by the shrimp industry, however, MFRD is in the process of finalizing the Regional Guidelines on traceability system to serve as basic reference for countries to establish their respective traceability systems.

**8. Accelerating Awareness and Capacity Building in Fish Health Management in Southeast Asia**

- AQD to hasten the sharing of its experiences in the implementation of the project's activities to the Member Countries;
- AQD to explore the possibility of undertaking activities in Myanmar that address problems on diseases in *Macrobrachium* spp. although Myanmar may have to provide the specific detailed information about the characteristics of the disease before AQD could extend the appropriate assistance; and
- Some on-site activities in requesting countries could be pursued in collaboration with relevant national institutes of the said countries.

**9. Food Safety of Aquaculture Products in Southeast Asia**

- The proposal to conduct a Regional Technical Consultation on early mortality syndrome (EMS) in white shrimps in 2015 has been developed for the consideration of the ASEAN Foundation.

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

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

- SEAFDEC to consider extending assistance to the countries in a more flexible and timely manner to be able to adjust when implementation plans at national level might have changed; and
- SEAFDEC to sustain the involvement of private sector in the project implementation.

- 11. Promotion of Countermeasures to Reduce IUU Fishing Activities**
  - SEAFDEC to continue extending capacity building activities on data conversion, and technical assistance to Viet Nam and Malaysia to facilitate submission of data to the RFVR database;
  - SEAFDEC to develop a mechanism on data use and confidentiality to ensure that data in the RFVR database is kept under secured system and utilized only for the benefit of the region;
  - ASEAN Member States to intensify their efforts in submitting data according to the agreed minimum requirements of the RFVR database; and
  - Other organizations, *e.g.* FAO, to implement activities that could assist the SEAFDEC Member Countries in combating IUU fishing and support the countries to implement the Port State Measures (PSM) and develop the National Plan of Action for Combatting IUU Fishing (NPOA-IUU fishing).
- 12. Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products**
  - The development of a “Catch Documentation Scheme” is an initial stage to pave the way toward future development of the “Catch Documentation System” for specific target species to enhance intra-regional trade among the ASEAN Member States.

***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**
  - It was noted that more collaboration on offshore tuna research surveys could be established in the South China Sea area such as between the Philippines and Viet Nam;
  - The M.V. SEAFDEC 2 would be utilized for the second fisheries resources survey in Sulu-Sulawesi Seas; and
  - Malaysia proposed to use the M.V. SEAFDEC 2 for two demersal surveys in the waters of Malaysia, the first from 28 February to 23 March 2015, and the second from 4 May to 22 June 2015.
- 14. Offshore Fisheries Resources Exploration in Southeast Asia**
  - SEAFDEC to consider developing appropriate fishing gear for use in untrawlable waters and for exploiting under-utilized deep sea resources in precautionary manner.
- 15. Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters**
  - It was noted that the development of RPOA-Sea Turtles would enhance the country’s effort in developing their respective NPOA-Sea Turtles.
- 16. Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in the Southeast Asian Region**
  - SEAFDEC to continue extending technical assistance and capacity building to Viet Nam on rights-based fisheries and co-management; and
  - SEAFDEC to expand its works and enhance capacity of relevant national staff of Viet Nam to enable them to analyze and link information compiled from local communities as inputs to data collection system at local level.
- 17. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region**
  - SEAFDEC to consider applying the “Total Effort Allowance System” which was developed by Japan and could be more suitable for the region.
- 18. Research and Management of Sharks and Rays in the Southeast Asian Waters**
  - It was noted that Malaysia had obtained funding from the Coral Triangle Initiative (CTI) to carry out a study on sharks and rays in Sabah by the Department of Fisheries Malaysia in collaboration with MFRDMD; and

- It was noted that TD together with MFRDMD and in consultation with CITES Secretariat developed a proposal to conduct a project on sharks and rays landing data collection, for possible financial support from the EU-CITES project.

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

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

- SEAFDEC to continue collaborating with organizations such as FAO and provide platform for development of common views of the Member Countries (*e.g.* on FAO Traceability Guidelines), in order that the region's views could be reflected at relevant FAO Consultations; and
- SEAFDEC to consider wider distribution of its publications and results of its initiatives, *e.g.* development of RFVR database and traceability system, so that relevant organizations would be well informed on the progress of the initiatives that SEAFDEC has been undertaking.

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

- SEAFDEC to continue the RFPN program to strengthen the capability of national fisheries agencies in the Member Countries; and
- SEAFDEC to consider hosting the forthcoming Meeting of the Asian Fisheries Acoustics Society (AFAS) in Bangkok, Thailand in November 2015 as this Meeting would enable SEAFDEC to cooperate with various stakeholders and enhance its visibility.

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

- SEAFDEC to consider establishing the overall linkage of activities implemented in the sub-regions;
- SEAFDEC to undertake follow-up actions after the First Meeting between Malaysia and Thailand and facilitate the development of MOU on bilateral cooperation on the development and management of fisheries between Malaysia and Thailand;
- It was noted that SEAFDEC would formulate activities for the Sulu-Sulawesi Seas Sub-region once the CTI-CFF Secretariat is launched and the collaborative arrangement between CTI-CFF and SEAFDEC is signed; and
- It was noted that SEAFDEC has been invited to be involved in a Meeting to be organized by NACA in March 2015 aiming to enhance the resilience of fisheries and aquaculture to climate change in the Lower Mekong Basin.

On the Proposed New FCG/ASSP Programs for the Year 2015 and Onwards, the Program Committee provided comments and suggestions to enhance the implementation of such projects as follows:

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

- It was noted that SEAFDEC plans to organize a Regional Technical Consultation in early 2015 to serve as platform for sharing of experiences and results of national initiatives on the EMS and would avail of the expertise of Japan in addressing EMS issues.

**2. Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources**

- The plan for the conduct of the RTC on Development and Use of Alternative Dietary Ingredients in Aquaculture Feed Formulations in Myanmar from 9 to 11 December 2014 was noted.

**3. Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region**

- Member Countries should demonstrate the progress made in improving the management of sharks and rays resources, as well as improving data collection of shark species;
- Concern was expressed on the difficulties in identifying shark species in the region;
- Assessment of stocks of specific shark species should be carried out;

- It was noted that Malaysia has launched the movement on “no to shark fins” while Brunei Darussalam would also enforce the banning of sharks catch and importation of sharks and its products by 2015; and
- For the sustainability of shark resources in the region, the development of fishing gear that target sharks should be discouraged.

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

- SEAFDEC to consider the project sites proposed by Thailand for the conduct of resource enhancement activities, such as in the waters of Ranong Province connected with Myanmar for the Indian mackerel and in the waters of Trat Province connected with Cambodia for the Indo-Pacific mackerel;
- SEAFDEC to consider providing technical support in forecasting fishing grounds within the national on-going fisheries resources programs of Viet Nam;
- The project should be implemented in coherent manner with similar activities under the REBYC-II CTI Project; and
- SEAFDEC to compile the outcomes and lessons learned from previous projects that deal with similar objective of improving the habitats of fish in fishing grounds as a basis for development of this project duplicating efforts.

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

- This project should be treated with urgency;
- The project should come up with appropriate sustainable resource management of eel resources to support the establishment of common position of the region if eel species would be proposed for listing in the CITES Appendices with Japan expressing willingness to support this activity; and
- A study on spawning season and spawning grounds should be conducted under the project to promote eel resource enhancement and breeding activities.

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

- The implementation of the project starting in 2015 was supported by the Program Committee.

**7. Cold Chain Management of Seafood,**

- MFRD would consider to address the risks associated with seafood that come with management of cold chains under the project; and
- It was noted that this project would help in reducing spoilage of fish along the supply chain resulting in more benefits to all stakeholders in the fishing industry especially fishers.

The Program Committee also endorsed **Departmental Programs** proposed for 2015 which comprises eight continuing programs from 2014, 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 speed up the dissemination of the results of its R&D such as the development of aquafeeds for selected species at specific growing stages, tissue culture of seaweeds, production of disease-free *Penaeus monodon*, and withdrawal period of antibiotics on important aquatic species, for the benefit of the stakeholders especially the small-scale fish farmers in the region;
- AQD to consider conducting a project on eco-friendly aquaculture in reservoirs in view of the socio-economic challenges that the country has encountered in the management of reservoir fisheries and aquaculture; and
- It was noted that AQD has shared the results of its programs and activities through accessible means of the Department.



## 2. Training Department

- For the project on “Energy Audit for Trawlers in the Gulf of Thailand”, Viet Nam requested the possibility for the country to participate in the project.
- Thailand, while expressing support to the activities that focus on low-energy consumption for demersal trawls, urged SEAFDEC to develop models that could be used for small-scale fishers in the region.

The Program Committee further considered and endorsed one **Other Program** on “Coastal Area Capability Enhancements in Southeast Asia” implemented in 2014 and proposed for 2015, and noted that the experiences gained from the project implementation would be shared with all Member Countries after the completion of this project.

Finally, the Program Committee took note of the status of three **Pipeline Projects** namely: 1) Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (UNEP/GEF/SEAFDEC Project); 2) Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (ASEC/IDB/SEAFDEC Project); and 3) Ocean and Fisheries Partnership Project (USAID/SEAFDEC Project).

The Program Committee took note of the strengthened cooperation with non-member governments and international/regional organizations, *i.e.* the FAO Regional Office for Asia and the Pacific (FAO/RAP); the Network of Aquaculture Centres in Asia-Pacific (NACA); the National Agriculture Training Council (NATC) of the Ministry of Agriculture and Agro-Based Industry Malaysia; the Mekong River Commission Fisheries Programme (MRC-FP); the Swedish Agency for Marine and Water Management (SwAM); the ASEAN-U.S. Project on Maximizing Agriculture through Knowledge, Enterprise Development, and Trade (USAID MARKET Project); and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA).

On Program Management Matters, the Program Committee took note of the development of the Master Plan for SEAFDEC’s Strategic Plan of Operation (2015-2020) which is considered as internal working document of SEAFDEC, and requested SEAFDEC Departments to further develop their respective “Plans of Operations and Programs of Works” taking into consideration the recommendations of the Program Committee for consideration by the SEAFDEC Council at its next meeting in 2015. Furthermore, the Program Committee also agreed in principle to adapt the format of SEAFDEC Project Document and the Evaluation Form as suggested by the representative from Japan to be used for monitoring and evaluation of SEAFDEC programs in the future.

With regards to the “Proposed Revision of the Guidelines on the Cost Sharing Policy for the Operation of the M.V. SEAFDEC 2” and the “Proposed Guidelines for Chartering/Renting of the M.V. SEAFDEC 2”, the Program Committee provided recommendations that should be incorporated in the proposals before submission of the SEAFDEC for consideration at its next meeting in 2015.

After the deliberations, the Program Committee adopted the Report of the 37<sup>th</sup> Meeting of the SEAFDEC Program Committee for submission to the 47<sup>th</sup> Meeting of SEAFDEC Council, and to the ASEAN through the 17<sup>th</sup> Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).

## SEAFDEC PROGRAMS OF ACTIVITIES FOR THE YEAR 2014-2015

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

*Existing Projects*

Program Thrust/Project Title	Lead Department	2014	2015
<b>Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security</b>			
1. Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement	TD	Y	N
2. Human Resources Development (HRD) Programs on Fisheries Management Approaches for Sustainable Fisheries	TD	Y	Y
3. Optimizing Energy Use/Improving Safety Onboard in Fishing Activities	TD	Y	Y
4. Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release	AQD	Y	N
5. Promotion of Sustainable and Region-oriented Aquaculture	AQD	Y	N
<b>Thrust II: Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade</b>			
6. Chemical and Drug Residues in Fish and Fish Products in Southeast Asia "Biotoxin Monitoring in ASEAN": ASP, AZA and BTX	MFRD	Y	Y
7. Traceability Systems for Aquaculture Products in the ASEAN Region	MFRD	Y	N
8. Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia	AQD	Y	N
9. Food Safety of Aquaculture Products in Southeast Asia	AQD	Y	N
<b>Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries</b>			
10. Strategies for Trawl Fisheries By-catch Management (FAO-GEF/REBYC-II CTI)	TD	Y	Y
11. Promotion of Countermeasures to Reduce IUU Fishing Activities	TD	Y	Y
12. Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for Trading of Fish and Fishery Products	MFRDMD	Y	Y
<b>Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries</b>			
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. Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters	MFRDMD	Y	N
16. Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region	TD	Y	Y
17. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD	Y	Y
18. Research and Management of Sharks and Rays in the Southeast Asian Waters	MFRDMD	Y	N
<b>Thrust V: Addressing International Fisheries-related Issues from a Regional Perspective</b>			
19. Assistance for Capacity Building in the Region to Address International Fisheries-related Issues	SEC	Y	Y
20. Strengthening SEAFDEC Network for Sustainable Fisheries	SEC	Y	Y

### Special Project

Proposed New FCG/ASSP Project	Lead Department	Period
1. Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia	SEC	2013-2017

### New Projects starting from 2015

Project	Lead Department	Period
1. Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region	AQD	2015-2019
2. Environment-friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources	AQD	2015-2019
3. Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD/ TD	2015-2019
4. Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia	TD	2015-2019
5. Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia	IFRDMD	2015-2019
6. Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia	IFRDMD	2015-2019
7. Cold Chain Management of Seafood	MFRD/AVA	2015-2017

### II. Departmental Programs

Project Title	Department	2014	2015
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 Program

Project Title	Department	2014	2015
1. Coastal Area Capability Enhancements in Southeast Asia (SEAFDEC/RIHN Collaborative Project)	TD	Y	Y

### IV. Pipeline projects

Project	Responsible agencies
1. Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand	UNEP/GEF/SEAFDEC
2. Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management	ASEC/IDB/SEAFDEC
3. Ocean and Fisheries Partnership Project	USAID/SEAFDEC

Y = Program implemented during the year

N = Program not implemented during the year

## CONTENTS

	<b>Paragraph No.</b>
<b>INTRODUCTION</b>	1-3
<b>I. OPENING OF THE MEETING</b>	4-6
<b>II. ADOPTION OF THE AGENDA AND ARRANGEMENTS OF THE MEETING</b>	7-8
<b>III. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2014 AND PROPOSED PROGRAMS FOR THE YEAR 2015</b>	9
3.1 Programs under the FCG/ASSP Mechanism	10-79
3.2 Departmental Programs	80-88
3.3 Other Program	89
<b>IV. PIPELINE PROJECTS AND EMERGING NEEDS FOR PREPARATION OF FUTURE PROJECT PROPOSALS</b>	90-93
<b>V. COOPERATION WITH DONORS, NON-MEMBER GOVERNMENT AND INTERNATIONAL/REGIONAL ORGANIZATIONS</b>	94-101
<b>VI. OTHER PROGRAM MANAGEMENT MATTERS</b>	
6.1 Master Plan for SEAFDEC's Strategic Plan of Operation (2015-2020)	102-104
6.2 Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards	105
6.3 Proposed Revision of Cost Sharing Policy and Proposed Chartering Policy for M.V. SEAFDEC 2	106-108
6.4 Others	109
<b>VII. CONCLUSIONS AND RECOMMENDATIONS OF THE THIRTY-SEVENTH MEETING OF THE PROGRAM COMMITTEE</b>	
7.1 Adoption of Report of the Meeting	110
7.2 Date and Venue of the Thirty-eighth Meeting of the Program Committee	111
<b>VIII. CLOSING OF THE MEETING</b>	112

## ANNEXES

<b>Annex</b>	<b>Page</b>
1. List of Participants	19
2. Opening Remarks by <i>Dr. Chumnarn Pongsri</i> , SEAFDEC Secretary-General	29
3. Agenda	31
4. Programs under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism for the Year 2014-2015	35
5. New Proposed Projects for the Year 2015 and Onwards	199
6. SEAFDEC Departmental Programs of Activities for the Year 2014-2015	235
7. Other Program	285
8. Statement by <i>Dr. Simon Funge-Smith</i> , Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific (FAO/RAP)	297
9. Statement by <i>Dr. Cherdsak Virapat</i> , Network of Aquaculture Centres in Asia-Pacific (NACA)	299
10. Statement by Representative from the National Agriculture Training Council (NATC) of the Ministry of Agriculture and Agro-Based Industry Malaysia	301
11. Statement by <i>Dr. Malasri Khumsri</i> , Mekong River Commission Fisheries Programme (MRC-FP)	303
12. Statement by <i>Mr. Peter Funegård</i> , Swedish Agency for Marine and Water Management (SwAM)	305
13. Statement by <i>Mr. Timothy P. Moore</i> , ASEAN-U.S. Maximizing Agriculture through Knowledge, Enterprise Development and Trade (MARKET)	307
14. Promoting Knowledge Management in SEAFDEC and the Member Countries	309
15. Master Plan for SEAFDEC's Strategic Plan of Operation (2015-2020)	311
16. Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards	321
17. Project Document and Project Evaluation Form for Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards (As suggested by the representative from Japan)	331
18. Guidelines on the Cost Sharing Policy for the Operation of the M.V. SEAFDEC 2 (Revised after comments from the 37 <sup>th</sup> PCM)	337
19. Guidelines for Chartering/Renting of the M.V. SEAFDEC 2 (Revised after comments from the 37 <sup>th</sup> PCM)	341
20. Closing Remarks by <i>Dr. Chumnarn Pongsri</i> , SEAFDEC Secretary-General	343

## LIST OF ACRONYMS

<b>AEG-CITES</b>	ASEAN Experts Group on the Convention on International Trade in Endangered Species of Wild Fauna and Flora
<b>ACDS</b>	ASEAN Catch Documentation Scheme
<b>AMAF</b>	ASEAN Ministers on Agriculture and Forestry
<b>AMS</b>	ASEAN Member States
<b>APFIC</b>	Asia Pacific Fisheries Commission
<b>AQD</b>	SEAFDEC Aquaculture Department
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>ASSP</b>	ASEAN-SEAFDEC Strategic Partnership
<b>ASWGF</b>	ASEAN Sectoral Working Group on Fisheries
<b>BOBLME</b>	Bay of Bengal Large Marine Ecosystem
<b>CCRF</b>	Code of Conduct for Responsible Fisheries
<b>CITES</b>	Convention on International Trade in Endangered Species of Wild Fauna and Flora
<b>COFI</b>	Committee on Fisheries
<b>CTI-CFF</b>	Coral Triangle Initiative – Coral Reefs, Fisheries and Food Security
<b>DOF</b>	Department of Fisheries
<b>EAFM</b>	Ecosystem Approach to Fisheries Management
<b>EEZs</b>	Exclusive Economic Zones
<b>EU</b>	European Union
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FCG</b>	ASEAN-SEAFDEC Fisheries Consultative Group
<b>GEF</b>	Global Environmental Facility
<b>IDB</b>	Islamic Development Bank
<b>IFRDMD</b>	SEAFDEC Inland Fishery Resources Development and Management Department
<b>IUU Fishing</b>	Illegal, Unreported and Unregulated Fishing
<b>JTF</b>	Japanese Trust Fund
<b>LRFFT</b>	Live Reef Food Fish Trade
<b>MARKET</b>	ASEAN-U.S. Maximizing Agriculture through Knowledge, Enterprise Development and Trade
<b>MCS</b>	Monitoring, Control and Surveillance
<b>MFRD</b>	SEAFDEC Marine Fisheries Research Department
<b>MFRDMD</b>	SEAFDEC Marine Fishery Resources Development and Management Department
<b>MPAs</b>	Marine Protected Areas
<b>MRC</b>	Mekong River Commission
<b>NACA</b>	Network of Aquaculture Centres in Asia-Pacific
<b>NATC</b>	National Agriculture Training Council, Malaysia
<b>NOAA</b>	U.S. National Oceanic & Atmospheric Administration
<b>PCM</b>	SEAFDEC Program Committee Meeting
<b>PSM</b>	Port State Measures
<b>RFMOs</b>	Regional Fisheries Management Organizations
<b>RFPN</b>	Regional Fisheries Policy Network

<b>RFVR</b>	Regional Fishing Vessel Record (for fishing vessels 24 meters in length and over)
<b>RIHN</b>	Research Institute for Humanity and Nature, Japan
<b>RTC</b>	Regional Technical Consultation
<b>SEAFDEC</b>	Southeast Asian Fisheries Development Center
<b>SOM-AMAF</b>	Senior Officials Meeting of the ASEAN Ministers on Agriculture and Forestry
<b>SwAM</b>	Swedish Agency for Marine and Water Management
<b>TAC</b>	Total Allowable Catch
<b>TD</b>	SEAFDEC Training Department
<b>UNEP</b>	United Nations Environmental Programme
<b>USAID</b>	U.S. Agency for International Development
<b>VMS</b>	Vessel Monitoring System

## REPORT OF THE THIRTY-SEVENTH MEETING OF THE PROGRAM COMMITTEE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

Ubun Ratchathani, Thailand  
1-3 December 2014

---

### INTRODUCTION

1. The Thirty-seventh Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Ubun Ratchathani, Thailand from 1 to 3 December 2014 and hosted by the Training Department (TD).
2. The 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, and representatives from collaborating partners of SEAFDEC, namely: FAO Regional Office for Asia and the Pacific (FAO/RAP), Mekong River Commission (MRC) Fisheries Programme, Network of Aquaculture Centres in Asia-Pacific (NACA), Swedish Agency for Marine and Water Management (SwAM), USAID Regional Development Mission for Asia (USAID RDMA), and the USAID Project on Maximizing Agriculture through Knowledge, Enterprise Development, and Trade (USAID MARKET Project). The SEAFDEC Secretary-General, Deputy Secretary-General and Department Chiefs as *ex-officio* members of the SEAFDEC Program Committee together with officers from the Secretariat and the Departments also attended the Meeting. The Representative from Timor-Leste as well as Members of the Regional Fisheries Policy Network (RFPN) also attended the Meeting. The list of participants, observers, and SEAFDEC officers, appears as **Annex 1**.
3. The Meeting noted the participation of the first Chief of the fifth SEAFDEC Department, the Inland Fishery Resources Development and Management Department (IFRDMD) based in Palembang, Indonesia, which has been inaugurated in early September 2014. The Program Committee also welcomed the participation of the representative from Timor-Leste to the Meeting as observer, in line with suggestion of the SEAFDEC Council at its 44<sup>th</sup> Meeting in 2012.

### I. OPENING OF THE MEETING

4. The Secretary-General of SEAFDEC *Dr. Chumnarn Pongsri*, in his capacity as Chairperson of the Program Committee, welcomed the participants and observers to the Meeting. He emphasized that as has been the practice, the order of the review of the progress of implementation of SEAFDEC programs start with the Programs under the FCG/ASSP Mechanism which have been grouped accordingly under the Program Thrusts of the SEAFDEC Program Framework, and followed by Departmental Programs and other programs, and pipeline programs. He added that one special project and the new proposed projects to start in 2015 would also be reviewed during the Meeting.
5. He also mentioned that the SEAFDEC Secretariat and Departments have been making efforts to comply with the instructions of the SEAFDEC Council and making adjustments as necessary in its programs and activities especially with respect to the efficient and effective management of the Center. To ensure that the requirements and priorities of the Member Countries are used as basis for formulating SEAFDEC programs, consultations among the SEAFDEC Secretariat and Departments had been regularly convened, the most recent of which was the interdepartmental workshop in early October 2014 to discuss the future direction of SEAFDEC taking into consideration the priority areas raised by the Member Countries as agreed upon by the SEAFDEC Council.
6. He cited that the Master Plan for SEAFDEC Strategic Plan of Operation for 2015 to 2020, an important output of the latest SEAFDEC interdepartmental consultation, would be used as basis for the subsequent formulation and/or revision of the Departments' Plans of Operation and Programs of Work as required by the SEAFDEC Council of Directors. Parallel with such initiative is the Monitoring and Evaluation of SEAFDEC Programs for 2015 and onwards as also required by the SEAFDEC Council. In this regard, he encouraged the Program Committee Members to closely scrutinize the programs of activity



of SEAFDEC to ensure that these respond to the requirements of the region and to come up with suggestions on the efforts of SEAFDEC to improve the management of the Center that would warrant the consideration of the SEAFDEC Council during its forthcoming 47<sup>th</sup> Meeting in 2015. With that note, he declared the 37<sup>th</sup> Meeting of the SEAFDEC Program Committee open. His Opening Remarks appears as **Annex 2**.

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

7. The representative from Japan requested to delete Agenda 6.1 and WP06.1 because such WP is a matter to be decided by the SEAFDEC Council, and the Council had not requested the SEAFDEC Secretariat to prepare such Master Plan and also making such a Master Plan by the Secretariat is against the Council's decision on Recommendation 3 of the Third SEAFDEC Review at the Special Meeting of the SEAFDEC Council in October 2013. However, the Program Committee agreed to continue discussion on such request in a closed session.

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

## **III. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2014 AND PROPOSED PROGRAMS FOR THE YEAR 2015**

9. The Program Committee took note of the progress of implementation of twenty projects under the FCG/ASSP Mechanism which have been categorized according to the SEAFDEC Program Thrusts endorsed by the SEAFDEC Council during its 41<sup>st</sup> Meeting in 2009 and one Special Project. In addition, seven new projects to start in 2015 were also reviewed. The progress and achievements of the projects in 2014 and the programs of activity for 2015, were reported by the SEAFDEC Secretariat and Departments. The results of the review process as well as the recommendations of the Program Committee will be submitted for endorsement to the higher authorities of the ASEAN and SEAFDEC.

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

10. While noting the progress and achievements made by the Secretariat and the Departments from the implementation of various projects in 2014, and the proposed activities for 2015 (**Annex 4**), the Program Committee approved the activities proposed under the projects in 2015, and suggested the ways and means that could pave the way for improving the projects and activities as follows:

#### **3.1.1 Progress of Implementation of Programs under the FCG/ASSP Mechanism in 2014**

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

##### **(1) Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds through Resources Enhancement**

11. Considering that the project would be completed in 2014 and that a new phase is planned for 2015, the representative from Japan suggested that the Member Countries should be involved more in site selection for this new phase and although limited budget could be provided for this project, he also suggested that the countries could continue to seek the assistance of SEAFDEC for appropriate site selection and on-site training based on cost-sharing scheme.

12. While recognizing the need to rehabilitate many fishing grounds in the Southeast Asian region that have been degraded, the representative from the Philippines suggested that SEAFDEC could consider documenting the results of this project and based on the results, fast-tracking the development of a model for fishing ground rehabilitation that could be used by the countries.

13. For the end-of-project seminar to be organized back-to-back with the International Symposium on Resource Enhancement tentatively planned for June 2015 in Thailand, the Program Committee for Malaysia suggested that the outcomes and impacts of the project could be included in the final report of

the project. While noting that many Southeast Asian countries have been conducting national programs on resources rehabilitation, the Program Committee Member for Viet Nam suggested that the relevant experiences of the countries could be compiled by SEAFDEC and exchanged during the end-of-project seminar.

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

14. While commending SEAFDEC for implementing this project which is beneficial to the Southeast Asian countries, the representative from Indonesia requested TD to consider developing the guidelines on ecosystem approach for fisheries management (EAFM) for fisheries extension officers to make it easy for them to promote the EAFM concept in their respective countries. In addition, the Program Committee Member for Lao PDR requested TD to consider extending the EAFM concept to Lao PDR for inland fisheries through on-site training.

15. Considering that there is a need to capacitate the countries on the EAFM concept, the representative from the Philippines suggested that TD could consider conducting an impact assessment of the application of the EAFM approach, and to make the results be it positive or negative impacts, known to local communities. In this connection, the Program Committee for Myanmar requested TD to assist the country in its capacity building activities on EAFM for local staff.

16. While recognizing the importance of integrating the EAFM concept in the countries' fisheries management plans, the Program Committee for Viet Nam raised the concern on the need to examine the adoption of the toolkits developed for the training course on EAFM. In addition, the representative from Japan suggested that while SEAFDEC could continue providing the concept for developing appropriate strategy for implementation of on-site training on fisheries management based on ecosystem approach, the countries could also consider providing in-kind support for such on-site training at the local level.

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

17. Considering that the project could provide maximum benefits to the stakeholders, the representative from Indonesia agreed on the proposed training activities in 2015 and encouraged the other Member Countries to be actively involved in the project activities. While expressing the appreciation to SEAFDEC for the implementation of this project, the Program Committee for Myanmar cited that this project could raise the awareness of stakeholders on the need to improve safety at sea especially in typhoon-prone areas of the Southeast Asian region. In this connection, the representative from the Philippines suggested that TD could urgently consider the need to raise the awareness of stakeholders by disseminating the relevant guidelines that made use as reference the lessons learned from affected areas in the Philippines as well as in other countries of the region.

18. While noting that the cost of fishing operations could be dependent on the design of fishing vessel and the fuel used, the Program Committee Member for Malaysia requested TD to consider developing a standard model for construction of appropriate fishing vessels using as reference the information on fishing boat designs developed by other fishing nations, *e.g.* Japan, Taiwan, Republic of Korea.

19. With regards to the training activities of the project in 2015, the representative from Japan suggested that such activities are rather useful. Therefore, Member Countries which have not requested for training activities should consider requesting for such activities. In this regard, Japan expressed its willingness to continue supporting the conduct such training activities including dispatch of Japanese experts.

## **(4) Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release**

20. While congratulating AQD for implementing this project, the representative from Indonesia suggested that AQD should consider transferring the experiences and lessons learnt from the project, through a workshop, the report of which should be distributed to the Member Countries. In this connection, the Program Committee Member for Malaysia expressed the interest in sending technical staff

from Malaysia to learn from AQD expertise on the mass production of humphead wrasse, mud crab, and corals. After informing the Program Committee that Myanmar is replacing wild stocks through culture-based fisheries, the Program Committee Member for Myanmar requested AQD to assist the country in improving the methodology adopted by the country in fish larvae production for some important fish species and mud crab in protected areas.

21. The representative from Japan while reiterating that this project focused on two species listed in the CITES Appendices, *i.e.* sea horse and Napoleon wrasse, as prominent activities of SEAFDEC, expressed the hope that this activity would be continued and also the hope that AQD will be the first in the world to make a breakthrough in the resource enhancement of these two species.

22. While noting that the project has succeeded in breeding many species such as abalone, sea cucumber, and other economically important species, the Program Committee Member for Viet Nam requested AQD to consider intensifying its technology transfer activities on this aspect in order that the Member Countries could receive the maximum benefit from the project.

#### **(5) Promotion of Sustainable and Region-oriented Aquaculture**

23. While commending AQD for conducting this project, the Program Committee Member for Myanmar requested AQD to provide assistance to Myanmar in its effort to conduct studies on the culture of species suitable for different climatic conditions.

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

#### **(6) Chemical 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**

24. While expressing support to this project considering the necessity of addressing Harmful Algal Blooms (HABs) and biotoxins issues in the region and since Malaysia has been confronted with increasing incidence of HABs in its waters, the Program Committee Member for Malaysia expressed willingness to participate in the future activities of this project.

#### **(7) Traceability Systems for Aquaculture Products in the ASEAN Region**

25. The representative from Indonesia while emphasizing on the importance of traceability system for aquaculture products, suggested that MFRD could consider developing an on-line traceability system to facilitate trading of fish and fish products. In this connection, it was clarified that the project is in the process of finalizing the Regional Guidelines on traceability system to serve as basic reference for countries to establish their respective traceability systems. Nevertheless, an on-line traceability system similar to those being applied in Thailand for shrimps has been developed by the private sector for commercial use.

#### **(8) Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia**

26. While commending AQD for implementing this project in view of its usefulness in accelerating the awareness and capacity building of the countries in fish health management, the representative from Indonesia requested AQD to hasten the sharing of its experiences in the implementation of project activities to the Member Countries.

27. The Program Committee Member for Malaysia, while also commending AQD for implementing this project as it addresses issues on fish health management for several economically important species, *e.g.* sea bass, groupers, shrimps, expressed the willingness to collaborate with AQD on its research activities that aim to address viral diseases in *Penaeus monodon* as well as for the development of specific pathogen-free broodstock of *P. monodon*.

28. The Program Committee Member for Myanmar also requested AQD to explore the possibility of undertaking activities in Myanmar that address problems on diseases in *Macrobrachium* spp., e.g. through technical support to enhance the capacity of its officers on this aspect. In order to sustain the implementation of the project after 2014, the representative from Japan expressed the view that the conduct of on-site activities in response to requirements of specific countries could be undertaken by in collaboration with relevant national institutes of the respective countries.

29. In responding to the aforementioned inquiries, AQD cited that the limited dissemination of results from this project is due to limited funds, nevertheless, on-site activities and training could be pursued by AQD on cost-sharing basis. For the request of Myanmar, AQD informed Myanmar that AQD would request Myanmar for the specific detailed information about the characteristics of the disease in order to provide the appropriate assistance.

#### **(9) Food Safety of Aquaculture Products in Southeast Asia**

30. While recalling the concerns expressed by the Member Countries during the last Program Committee Meeting on the urgent need to address Early Mortality Syndrome (EMS) in white shrimps, the Program Committee Member for Viet Nam queried about the progress made by SEAFDEC in compiling research advances relevant to EMS, with support from the Japanese Trust Fund. In response, AQD informed the Committee of its plan to conduct a Regional Technical Consultation on EMS in 2015 to exchange information on the advances in EMS research, the proposal of which has been developed for consideration of the ASEAN Foundation.

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

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

31. The Program Committee Member for Viet Nam while sharing experiences with regard to the assistance extended by SEAFDEC through this project which might not be flexible enough especially when implementation plans at the national level had been changed, requested SEAFDEC to consider extending assistance in a more flexible and timely manner. In addition, while commending TD for involving the private sector in the implementation of the project, e.g. fishmeal production companies and fishing industries involved in trawl fisheries management, demonstrating the development of close linkage between capture fisheries and aquaculture, the Program Committee Member for Viet Nam expressed the concern for participating countries to achieve the project's desired outputs. The Program Committee Member for Cambodia also suggested that SEAFDEC could consider developing the summarized results of the project, including the outcomes during the previous years, and the proposed activities in the coming years to facilitate the understanding of the Program Committee Members.

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

32. Considering that fishing vessels of Viet Nam are managed in horsepower and not in total length, which is inconsistent with the requirements of the RFVR database, and caused the delay in submission of data from Viet Nam. She requested SEAFDEC to continue extending assistance in capacity building on data conversion, and technical assistance to come up with sufficient justification for submission of data to the RFVR database. The Program Committee Member for Malaysia also expressed similar difficulty due to the recording of its fishing vessels in gross tonnage, and sought the assistance of TD to enable the country to provide the necessary data accordingly.

33. While expressing his country's appreciation to TD for implementing this project as it has paved the way towards combating IUU fishing, the Program Committee Member for Cambodia asked other organizations, e.g. FAO, to also implement activities that could assist the Member Countries in combating IUU fishing as well as support the countries to implement the Port State Measures (PSM) and develop the National Plan of Action for Combating IUU Fishing (NPOA-IUU fishing).

34. While commending TD for its initiative in developing the database for Regional Fishing Vessels Records (RFVR) for vessels 24 meters in length and over, and urging the ASEAN Member States to submit data as required for the database, the representative from Japan clarified that one of the important objectives of establishing such database is to identify vessels flying double flags which is among the major concerns for continued efforts in combating IUU fishing activities in the region.

35. The representative from Indonesia, while expressing appreciation to the efforts of SEAFDEC in the development of the RFVR, informed the Committee that Indonesia has also submitted data of its fishing vessels to relevant RFMOs which are considered classified. In this connection, SEAFDEC was requested to develop a mechanism on data use and confidentiality to ensure the data in the RFVR database is kept under secured system and utilized only for the benefit of the region.

36. Considering that the development of the RFVR has been endorsed in the Special SOM-34<sup>th</sup> AMAF in 2013 under ASEAN mechanism, TD suggested that the ASEAN Member States could consider intensifying their efforts in submitting their data according to the agreed minimum requirements. Although most countries in the region have compiled their respective fishing vessel records, so far only Brunei Darussalam, Malaysia, and Thailand submitted the complete information as required for the RFVR database.

37. The Program Committee Member for Viet Nam expressed the concern on the SEAFDEC plan to develop the regional database for fishing vessels below 24 meters in length, as Viet Nam will be faced with challenges in providing the required data to the database.

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

38. While noting the low amount of budget allocated for some activities of the project in 2015, the representative from Japan expressed the concern that this might not allow the project to come up with good results. In response, it was clarified that the proposed budget presented to the Meeting was only for those allocated by MFRDMD since some cost for certain activities under this project were also provided by the SEAFDEC Secretariat. Furthermore, considering the benefits that could be gained from the development of an ASEAN “Catch Documentation Scheme”, the Member Countries also expressed the willingness to support the participation of their respective officers at the RTC on ASEAN Catch Documentation Scheme (16-18 December 2014 in Langkawi, Malaysia) at their own cost.

39. The Program Committee Member for Malaysia while seeking clarification on whether this project intends to come up with “Catch Documentation Scheme” or “Catch Documentation System” as approved by the SEAFDEC Council and the ASWGFi, suggested that the development of such “scheme” or “system” should be accepted by importing countries especially the EU in order that this could supersede individual national systems that is currently being applied. In this regard, it was clarified that the project is aimed at developing a “Catch Documentation Scheme” which is considered as an initial stage to pave the way toward the development of the “Catch Documentation System” in the future. Moreover, the “Catch Documentation Scheme” developed under this project is intended to combat the trading of IUU fish and fishery products, and promote intra-regional trade among the ASEAN Member States, but would not cover the trading of fish products from the region to the EU or the scheme applied by RFMOs.

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

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

40. While expressing his appreciation to TD for the conduct of collaborative tuna resources research survey in Sulu-Sulawesi Seas considered with high recruitment and spawning ground of offshore tuna, the representative from the Philippines informed the Meeting that data derived from this survey could help in validating the spawning and recruitment areas of tuna in the Western and Central Pacific Ocean. He therefore, looked forward to more collaboration among the Member Countries on offshore tuna research

surveys in the future, such as between Viet Nam and Philippines for research survey in their EEZs and the South China Sea area; and the Program Committee Member for Viet Nam expressed support to the suggestion made by the representative from the Philippines. Moreover, the Program Committee also took note of the proposed utilization of the M.V. SEAFDEC 2 for the second fisheries resources survey in Sulu-Sulawesi Seas.

41. The Program Committee Member for Malaysia informed the Meeting of the country's intention to utilize the M.V. SEAFDEC 2 for two surveys in 2015. The first is for a demersal survey in the West Coast of Sabah and part of Sarawak waters, tentatively scheduled from 28 February to 23 March 2015, encompassing 2 trips with 2 days stop each at Labuan and Kota Kinabalu ports. The total days at sea of the vessel could be 20 days. The second is a demersal survey in Sarawak Waters, tentatively scheduled from 4 May to 22 June 2015, encompassing 4 trips with 2 days stop each at Labuan, Miri, Bintulu, Tg Manis/Sarikei Ports (twice). The total days at sea could be 40 days. In total, the number of days of the vessel at sea for both trips could be 60 days.

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

42. In response to the query of the representative from Indonesia on the differences between the projects on "*Fisheries Resources Survey & Operational Plan for M.V. SEAFDEC 2*" and "*Offshore Fisheries Resources Exploration in Southeast Asia*", it was clarified that the first project intends to provide platform for countries to request for utilization of the M.V. SEAFDEC 2 under cost-sharing scheme; while the latter focuses on the conduct of technical works of TD, using the M.V. SEAFDEC 2 to explore the offshore fishery resources in the region.

43. The representative from the Philippines while acknowledging the efforts of SEAFDEC to encourage Member Countries to conduct offshore surveys for under-utilized resources in untrawlable waters, mentioned that some countries might be already conducting their own surveys of deep sea resources such as those conducted by the Philippines. In this connection, he also suggested that SEAFDEC could consider developing the appropriate fishing gear that could be used in untrawlable waters and for exploiting the under-utilized deep sea resources in precautionary manner.

#### **(15) Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters**

44. With regard to the Regional Plan of Action for Conservation and Management of Sea Turtles (RPOA-Sea Turtles), the representative from Indonesia informed the Program Committee that Indonesia has developed the draft NPOA-Sea Turtles and is now in the process of conducting consultations with the country's related Ministries. In this regard, she looked forward to the development of the RPOA-Sea Turtles to enhance the country's effort in developing its NPOA-Sea Turtles and to make sure that its NPOA complement with the RPOA. While noting that some Southeast Asian countries have already developed their NPOAs, it was clarified that Indonesia could also make use of the RPOA, once available, as reference in developing its NPOA.

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

45. While expressing the appreciation to SEAFDEC for conducting Training of Trainers (TOT) on Rights-based Fisheries Management and Co-management as well as on Legislative and Institutional Aspects of Rights-based Fisheries Management in Viet Nam, the Program Committee Member for Viet Nam informed the Program Committee that the outputs from this training course have been submitted to its Ministry for approval on the conduct of a pilot site study that will focus on the application of rights-based fisheries and co-management at local communities, and subsequent adjustment of its national law on rights-based fisheries and co-management. She also requested SEAFDEC to continue extending technical assistance and capacity building to Viet Nam on the relevant aspects of rights-based fisheries and co-management.

46. Moreover, the Program Committee Member for Viet Nam also informed the Program Committee that while activities had been implemented in Viet Nam to facilitate the compilation of information from local communities to support fisheries management plan, but such data could not be linked and serve as inputs to data collection system at the local level, and therefore requested SEAFDEC to expand its works to enhance the capacity of related national staff on this aspect.

47. While expressing the appreciation to SEAFDEC for implementing the project, particularly for conducting Mobile On-site Training (MOT) on Facilitating Fisheries Information Gathering Through Introduction of Community-based Fisheries Management in Sakon Nakhon Province, Thailand, the representative from Thailand informed the Meeting that such activity has led to the establishment of fisheries committee and community-based fisheries management at community level.

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

48. While expressing concern on the attempt of SEAFDEC to apply the Total Allowable Catch (TAC) system, which might not be suitable to tropical fisheries due to its highly complex ecosystem and diversity of species, the representative from Japan suggested that SEAFDEC consider the application of “Total Effort Allowance System” instead, which was developed by Japan and could be more suitable for the fisheries of the region.

49. In responding to the inquiry of the representative from the Philippines on the objective of the project, MFRDMD clarified that this project aims to determine the fishing capacity of purse seine, and come up with management plan that sustain resources utilization and optimize benefits.

#### **(18) Research and Management of Sharks and Rays in the Southeast Asian Waters**

50. In response to the query of the representative from the Philippines on the priority species to be focused under this project, it was clarified that the focused species would be those being listed under the CITES Appendices and those that are commonly found in the region. Considering the insufficient level of awareness of fishers on the listing of sharks and rays in the CITES Appendices, information dissemination activities should be undertaken to enhance the knowledge and awareness of local fishers on this matter. On the demarcation of the works of TD and MFRDMD as both Departments have been implementing projects related to sharks and rays, it was clarified that the activities of TD focus mainly on the compilation of catch data, while those of MFRDMD focus on biological data including species identification.

51. While commending MFRDMD for the continuation of the project, the Program Committee Member for Malaysia informed the Meeting that Malaysia had obtained some funding from the Coral Triangle Initiative (CTI) to carry out a study on sharks and rays in Sabah, and that the Department of Fisheries Malaysia will collaborate with MFRDMD for the conduct of the said study.

52. The Program Committee took note of the proposal prepared by TD pertaining to the project on sharks and rays landing data collection towards sharks NDF, which intends to obtain financial support from the EU-CITES project.

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

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

53. While acknowledging the importance of the project, the Program Committee Member for Singapore requested SEAFDEC to provide the details of the planned activities to the Member Countries. In addition, the Program Committee Member for Viet Nam encouraged SEAFDEC to continue collaborating with organizations such as FAO and provide platform for development of common views of the Member Countries (*e.g.* on FAO Traceability Guidelines), in order that the region’s views could be reflected at relevant FAO Consultations.

54. The representative from FAO/RAP, while congratulating SEAFDEC for undertaking initiatives to address international trade-related issues, particularly the development of RFVR and traceability system, suggested that SEAFDEC should consider wider distribution of its publications and results of its initiatives, *e.g.* through SEAFDEC website, establishment of E-group(s), for relevant organizations to be kept well informed on the progress of the initiatives that SEAFDEC has been undertaking.

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

55. While expressing the appreciation to SEAFDEC for supporting Indonesia, especially for the establishment of the IFRDMD, the representative from Indonesia informed the Program Committee that the first Department Chief of IFRDMD *Mr. Budi Iskandar Prisantoso* has been designated by the Government of Indonesia. In this connection, Indonesia has requested the Government of Japan to nominate the Deputy Department Chief of IFRDMD in accordance with Article 10 of the Agreement Establishing SEAFDEC, as soon as possible to enable IFRDMD to develop its plans and programs of activities. In response, the representative from Japan ensured SEAFDEC that the Deputy Department Chief of IFRDMD would be designated by mid of January 2015.

56. The Program Committee Member for Myanmar while commending SEAFDEC for sustaining the Regional Fisheries Policy Network (RFPN), informed the Program Committee of the relevance of RFPN not only in promoting enhanced cooperation among the Member Countries but also in building the capacity of technical officers from the Member Countries attached to SEAFDEC as RFPN Members, an opportunity that could not be availed of from the academe or from training institutions. He therefore suggested that SEAFDEC should consider continuing the RFPN program to strengthen the capability of national fisheries agencies in the Member Countries.

57. SEAFDEC was asked to consider hosting the forthcoming Meeting of the Asian Fisheries Acoustics Society (AFAS) in Bangkok, Thailand in November 2015 at no cost involved on the part of SEAFDEC. Nevertheless, the participation of scientists, acoustics experts, and the private sector in this AFAS Meeting would enable SEAFDEC to cooperate with various stakeholders and to make known its programs and activities on sustainable fisheries development and management. In such manner, the visibility of SEAFDEC could also be enhanced.

### **3.1.2 Special Projects**

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

58. While commending SEAFDEC and the SEAFDEC-Sweden Project for implementing the project, the representative from Thailand looked forward to cooperating with the project especially on the sustainable management of transboundary stocks through cooperation with Cambodia in Koh-Kong and Trat Province. In addition, the Program Committee Member for Viet Nam while acknowledging the objective of promoting sub-regional mechanism through the project, suggested that SEAFDEC should consider establishing the overall linkage of the activities implemented in the sub-regions.

59. Moreover, the Program Committee Member for Malaysia while recognizing the relevance of the project to the Member Countries, expressed the hope that follow-up actions would be undertaken after the First Meeting between Malaysia and Thailand, and later on, develop the proposed MOU on bilateral cooperation between Malaysia and Thailand on the development and management of fisheries.

60. The Program Committee took note of the initiative of SEAFDEC to develop collaborative arrangement with the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) to foster Research and Development (R&D) in fisheries in the countries around the Coral Triangle. The Program Committee was also informed that upon the formal launching of the CTI-CFF Secretariat and signing of collaborative arrangement between CTI-CFF and SEAFDEC, activities would be formulated under this project for the Sulu-Sulawesi Seas Sub-region.

61. In a related development, the representative from NACA informed the Program Committee that NACA has signed the Letter of Agreement with FAO to enhance the resilience of fisheries and aquaculture to climate change in the Lower Mekong Basin with the involvement of four countries,



namely: Cambodia, Lao PDR, Thailand and Viet Nam. It was also noted that NACA is planning to convene a Meeting for this project in March 2015, and SEAFDEC will be invited to participate in the Meeting accordingly.

### **3.1.3 New Proposed Projects for the Year 2015 and Onwards**

62. While considering the new proposed projects to start in 2015 (**Annex 5**), the Program Committee provided recommendations for the improvement of the projects and agreed to endorse the proposed projects taking into consideration the following recommendations:

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

63. The Program Committee endorsed and supported the implementation of this new project starting in 2015. Specifically, the Program Committee Members for Brunei Darussalam, Indonesia, Malaysia, Myanmar, Thailand and Viet Nam expressed the wish for their countries to participate in the activities of the project. Nevertheless, since many countries have already conducted national programs to address the incidence of EMS in their respective shrimp culture industry, the Program Committee Members suggested that SEAFDEC should consider setting up a forum to exchange the experiences of the countries in addressing EMS in shrimps as well as avail of the expertise of Japan on this matter.

64. In responding to the abovementioned concerns of the Member Countries, the Program Committee was informed that the proposed RTC in 2015 would address issues on the EMS in shrimps and could serve as platform for sharing of experiences and results of national initiatives on the EMS. The Program Committee expressed their gratitude to the ASEAN Foundation and the Japanese Trust Fund (JTF) for jointly supporting the RTC.

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

65. In support of the project as proposed by AQD, the Program Committee Members endorsed the project for implementation starting in 2015, considering the relevance of the project to the development of aquaculture industry in the region. More specifically, the Program Committee Member for Myanmar expressed his gratitude to AQD for assisting Myanmar through the conduct of RTC on Development and Use of Alternative Dietary Ingredients in Aquaculture Feed Formulations in Myanmar from 9 to 11 December 2014, as this could serve as means of reducing dependence on fish meal for the developing aquaculture industry of the region. In addition, the representative from Thailand while also supporting the implementation of the project, requested AQD to assist in the conduct of sea ranching activities in Thailand for abalone and sea cucumber, and expressed the willingness to share the experiences learned from such activities to the other Member Countries.

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

66. While recognizing the importance of this project for the sustainable fisheries of sharks and rays, the Program Committee Members supported the implementation of the project starting in 2015. Specifically, the representative from Japan expressed the view that it is necessary for the region to demonstrate the progress made in improving the management of sharks and rays resources in sustainable manner, as well as in improving data collection of the species.

67. Moreover, the Program Committee also expressed the concern on the difficulties encountered with respect to the identification of shark species considering that not all sharks species in the region are considered endangered. Specifically, the representative from the Philippines suggested that assessment of stocks of specific shark species could be carried out while the Program Committee Member for Malaysia agreed with the representative from the Philippines, and informed the Program Committee that Malaysia already launched the movement on “no to shark fins” which does not mean that the country is against sharks fishing, but the country is against sharks finning at sea and throw the rest of the shark body parts to the sea.

68. Moreover, the Program Committee Member for Cambodia expressed the view that specific species of sharks could still be caught for the welfare of small-scale fishers. Currently, there is no specific fishing gear to catch shark species, he therefore suggested that fishing gear that target sharks should not be developed to ensure that the shark resources in the region could be sustained. In a related development, the Program Committee Member for Brunei Darussalam informed the Program Committee that the country would enforce the banning of sharks catch and importation of sharks and its products by 2015, due to the drastic decline of sharks and in order to portray the image of Brunei Darussalam as a green country.

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

69. While noting the importance of the project for the sustainable utilization of fisheries resources, the Program Committee Members supported and endorsed the implementation of the project starting in 2015. Specifically, the representative from Thailand proposed project sites to be in the waters of Ranong Province connected with Myanmar for the Indian mackerel and in the waters of Trat Province connected with Cambodia for the Indo-Pacific mackerel.

70. Moreover, the Program Committee Member for Viet Nam requested SEAFDEC to provide technical support in forecasting of fishing grounds within its national on-going fisheries resources programs. It was also viewed that some activities under this project could be rather similar with those of the REBYC-II CTI Project and thus suggested that the two projects should be implemented in coherent manner to create value-adding and avoid duplication of efforts.

71. In a related development, the Program Committee Member for Cambodia informed the Program Committee that the country has been conducting activities on the conservation of critical habitats and transboundary fish species supported by the SEAFDEC-Sweden Project and UNEP/GEF.

72. Considering that the project is beneficial to small-scale fishers since most resources have been degraded due to human activities, the Program Committee Member for Malaysia requested SEAFDEC to compile the outcomes of previous projects that deal with similar objective of improving the habitats of fish in fishing grounds, for the benefit of the stakeholders especially the small-scale fishers. Similarly, the representative from Indonesia also suggested that SEAFDEC could consider compiling the lessons learned from similar projects conducted in the region to be used for the development of the project without duplicating efforts.

73. In order to delineate the activities under the project, the representative from Japan suggested that transboundary resources issues including transboundary pelagic species should be considered under the project of MFRDMD while this project which will be implemented by TD could focus on resource enhancement to support small-scale fisheries activities and transferring the concept to the Member Countries.

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

74. The Program Committee while supporting the implementation of the project, agreed to endorse the project considering that eels could constitute one of the biggest contributors to improved incomes of small-scale fishers and economies of the countries. In this connection, the representative from Japan suggested that the project should come up with appropriate sustainable management of eel resources, and also support the establishment of common/coordinated position of the region if eel species would be proposed for listing in the CITES Appendices. In this connection, the representative from Japan expressed the willingness of the Government of Japan to continue supporting this activity.

75. In addition, the representative from Thailand suggested that a study on spawning season and spawning grounds could also be conducted under the project to promote eel resource enhancement and breeding activities. The representative from the Philippines also requested SEAFDEC that this project should be treated with urgency due to present and emerging threats to the eel fisheries.

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

76. Considering the importance and relevance of this project for the sustainable development and management of inland fisheries in the Southeast Asian region, the Program Committee agreed to support and endorsed the implementation of the project starting in 2015.

## **(7) Cold Chain Management of Seafood**

77. The Program Committee while supporting the implementation of the project starting in 2015, sought the clarification of SEAFDEC on the scope of the project. Specifically, the representative from Indonesia suggested that MFRD could consider conducting risk assessment of the quality of seafood in cold chains for food safety. In response, since this is beyond the scope of the project, MFRD agreed that the risks associated with seafood that come with management of cold chains would be considered in the project.

78. The representative from Japan expressed his appreciation to the Government of Singapore for allocating funds to support this project, and encouraged all Member Countries to also explore the possible funding sources that could be mobilized to support regional activities in the future.

79. The Program Committee Member for Malaysia supported the project considering that this would help reducing spoilage of fish along the supply chain, and thus resulting in benefits to all stakeholders in the fishing industry especially fishers. In response to his inquiry on the potential pilot site, it was informed that the pilot trial would be discussed and identified during the project inception meeting to be convened in 2015.

## **3.2. Departmental Programs**

80. While considering the progress and achievements in the implementation of SEAFDEC Departmental Programs in 2014 and the proposed programs for 2015 (**Annex 6**), the Program Committee provided recommendations for the improvement of the programs and endorsed the implementation of the programs, taking into consideration the following recommendations:

### **3.2.1 Aquaculture Department**

81. The Program Committee noted the progress and achievements of AQD's programs in 2014 including the results of R&D activities under the five thematic programs, 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; 5) and Quality Seeds for Sustainable Aquaculture. While endorsing the achievements of AQD, the Program Committee reiterated the need for AQD to speed up the dissemination of the results of its R&D for the benefit of the stakeholders especially the small-scale fish farmers in the region.

82. While commending AQD for the achievements attained in its programs and activities, the representative from Indonesia suggested that AQD could consider conducting a project on eco-friendly aquaculture in reservoirs in view of the socio-economic challenges that the country has encountered in the management of reservoir fisheries and aquaculture.

83. The Program Committee Members for Malaysia, Thailand and Viet Nam expressed the appreciation to AQD for successfully carrying out several projects on sustainable aquaculture development, and reiterated that results of its research activities such as the development of aquafeeds for selected species at specific growing stages, tissue culture of seaweeds, production of disease-free *Penaeus monodon*, and withdrawal period of antibiotics on important aquatic species, should also be disseminated to the Member Countries and small-scale aquaculture industries in the region.

84. In response, the Program Committee was informed that AQD always share the results of its programs and activities through very accessible means, such as articles published in scientific journals which could be availed of through the AQD Repository, extension manuals that could be obtained at

minimal prices, hands-on training that could be arranged upon request, visit of AQD researchers in the country's farms, and through the AQD website.

### **3.2.2 Training Department**

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

86. Considering the relevance of the project on “*Energy Audit for Trawlers in the Gulf of Thailand*” to the fisheries of Viet Nam, the Program Committee Member for Viet Nam requested TD for the possibility of the country's participation in such project. In response, the Program Committee was informed on the status of this project where TD is in the process of signing the agreement for the project to be implemented during January to June 2015 and that concerned technical officers of Viet Nam are welcomed to participate in relevant activities at their own expense. In this regard, TD would provide the schedule of activities to be undertaken under this project to Viet Nam.

87. On the inquiry of the representative from Indonesia regarding the activity related to improvement of landing facilities in fishing ports, it was clarified that this activity which is conducted in collaboration with the Fish Market Organization of Thailand, put more focus on improving the hygiene and sanitation facilities in local fishing ports and landing sites.

88. The representative from Thailand, while expressing support to the activities that focus on low-energy consumption for demersal trawls, looked forward to the development of models by SEAFDEC, that could be used for small-scale fishers in the region.

### **3.3. Other Program**

89. The Program Committee considered and endorsed the progress in the implementation of the project on Coastal Area Capability Enhancements in Southeast Asia (**Annex 7**) which is supported by the Research Institute for Humanity and Nature (RIHN), and noted that the experiences gained from the implementation of this project would be shared with all Member Countries after the completion of this project.

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

90. The Program Committee noted the status of the pipeline projects and emerging needs for future projects, namely: Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (ASEC/IDB/SEAFDEC), Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (UNEP/GEF/SEAFDEC), and The Oceans and Fisheries Partnership (USAID/SEAFDEC).

91. On the proposed collaborative project with the Islamic Development Bank (IDB), the Program Committee Member for Malaysia inquired about the progress of the negotiations for the finalization of the project and signing of the collaborative arrangement in accordance with the results of the recent ASWGFi Meeting. In response, it was clarified that to date there has been no progress made therefore, the proposed project would continue to be classified under the pipeline project.

92. Concerning the possible duplication of activities of the existing SEAFDEC projects with those in the proposed collaborative project with USAID, the Program Committee was informed that the proposed project would not duplicate with other projects already implemented in the region but it will be complementary as it aims to supplement the initiatives that have already been implemented in the region, help advance the robust programs already implemented by operationalizing the projects already implemented in the region, and implement the EAFM and IUU fishing countermeasures in transboundary areas *in situ*. The preparation phase of the project which is expected to start in December 2014 in partnership with NOAA, will conduct consultations with stakeholders in the demonstration countries of

the Sulu-Celebes Seas from January to June 2015. In this connection, the Program Committee Members for these countries were requested to consider hosting the said consultations including an EAFM workshop in May 2015 in collaboration with CTI-CFF.

93. On human resources requirements for the proposed pipeline projects implementation, the Program Committee was informed that human resources for the USAID/SEAFDEC Project would be covered by project contractor and would not create any burden to the staff of SEAFDEC.

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

94. Representatives from the collaborating partners of SEAFDEC attending the Program Committee Meeting were invited to inform the Program Committee of their respective fisheries programs and the potential areas of mutual cooperation with SEAFDEC. The summary of their statements are as follows:

95. The Senior Fishery Officer of the FAO Regional Office for Asia and the Pacific (FAO/RAP), *Dr. Simon Funge-Smith* expressed the appreciation to SEAFDEC for providing the opportunity for FAO/RAP on behalf of the Regional Representative for FAO/RAP to provide a statement during this SEAFDEC Program Committee Meeting on the cooperation and coordination of the programs of work of FAO and SEAFDEC. He emphasized that the review of the SEAFDEC programs especially the HRD activities on fisheries management approach for sustainable fisheries, links strongly to the essential Ecosystem Approach for Fisheries Management, which was developed by BOBLME/NOAA/APFIC as a training course with SEAFDEC as one of the implementing agencies. He also recognized the promotion of sustainable aquaculture and looking for further regional partnership, public and private sector on implementing a strategy in aquaculture development in the region. He also appreciated the cooperation between SEAFDEC and FAO in the joint execution of the Strategies for Trawl Fisheries Bycatch Management (REBYC-II CTI), and the cooperation between SEAFDEC and BOBLME, particularly in the area of development of the regional training course on EAFM as well as the forthcoming cooperation of SEAFDEC on combating IUU fishing and improving catch certification. In addition, he also congratulated Indonesia and SEAFDEC on the newly SEAFDEC Inland Fishery Resources Development and Management Department that will strengthen efforts to manage inland fisheries in the ASEAN region. He congratulated Singapore and Brunei Darussalam for becoming members of FAO, making all Member Countries of SEAFDEC now members of FAO. Finally, he invited SEAFDEC to participate in the forthcoming APFIC/FAO regional consultative workshop on improving the contribution of culture-based fisheries and related fishery enhancements in inland waters to blue growth on 24-27 May 2015 in Colombo, Sri Lanka and APFIC/FAO regional consultative workshop on Documentation and Dissemination for Successful Sustainable Aquaculture Intensification Practices in Asia to be convened in June 2015. His statement appears as **Annex 8**.

96. The Director-General of the Network of Aquaculture Centres in Asia-Pacific (NACA), *Dr. Cherdasak Virapat* expressed his gratitude to SEAFDEC for the invitation extended to NACA to participate at this Meeting. He informed the Program Committee that NACA promotes and implements activities in the Asia-Pacific region that would enhance the collaboration and cooperation between NACA and SEAFDEC. He also reiterated NACA's development objectives which include the promotion of rural development through sustainable aquaculture and aquatic resources management where NACA's works are based on five thematic programs, namely: aquatic animal health; sustainable farming systems; genetics and biodiversity; food safety, quality and certification; and response to climate change, and also three cross-cutting programs on education and training; gender; and information and communications. He also informed the Program Committee that in the next five years, NACA's strategy on aquaculture will be focused on: 1) Adaptive management for small-scale rural aquaculture development for poverty reduction; 2) Emergency rapid appraisal of amplification of shrimp disease by inbreeding; 3) Improved information and communication between NACA and its member government agencies; 4) Capacity building programs in aquaculture governance; 5) Migration and adaptation on impacts of climate change on aquaculture and fisheries; and 6) Strengthening cooperation and coordination among member government agencies, NACA partners, and public-private partnership. Finally, he expressed the hope that NACA and SEAFDEC would find the opportunity to strengthen the collaboration and coordination on strategic foresights in aquaculture development in the future. His statement appears as **Annex 9**.

97. On behalf of the National Agriculture Training Council (NATC) of the Ministry of Agriculture and Agro-Based Industry Malaysia, the representative from Malaysia read the statement on the collaborative efforts between SEAFDEC and NATC. Firstly, the Program Committee was informed that the Honorable Secretary General of the Ministry of Agriculture (MOA) Malaysia approved the appointment of SEAFDEC/TD as one of the technical advisors for the Technical Committee of the College of Fisheries Malaysia to assist NATC in the proper and effective operation and capacity building of the college, the appointment letter would be sent to SEAFDEC soonest. Secondly, he requested the other Departments of SEAFDEC, the Member Countries, and international organizations or agencies to assist NATC in providing advance training, technical aids and transfer of skill-based knowledge in the field of fisheries as Malaysia is urgently in need of experts and skilled personal to teach Capture Fisheries Technology and Marine Engineering in relation to fishing vessels. Thirdly, he also wished to inform the Program Committee that the activities of TD include two proposed tailor-made training programs for NATC the budget of which has been approved by the Malaysian central authorities. He expected that this training program in Thailand would benefit the anchovy fishers from Pankor. Finally, while expressing regrets for not being able to participate in this Program Committee Meeting due to certain circumstances beyond his control, he looked forward to seeing the successful results of the Meeting. He also reiterated the sincere gratitude of NATC to SEAFDEC for the assistance extended in human resource development aspects from 2008 until the next years to come. His statement appears as **Annex 10**.

98. The Fisheries Governance and Management Specialist from Mekong River Commission Fisheries Programme (MRC-FP), *Dr. Malasri Khumsri* expressed her appreciation to SEAFDEC for extending invitation to MRC-Fisheries Programme (MRC-FP) to attend in the 37<sup>th</sup> Program Committee Meeting. She informed the Meeting that the MRC-FP is implementing its (FP) Implementation Plan (PIP) 2011-2015 with the objectives of “successful implementation of measures for sustainable fisheries management and development and improved livelihoods by regional and national organizations”. She then expressed the willingness of the MRC-FP to continue cooperation closely partner including SEAFDEC, NACA, FAO and relevant organizations in sharing and exchange of information for sustainable development and management of inland fisheries in the Lower Mekong Basin. She then elaborated on three priorities working area, namely: 1) Project implementation on Transboundary Fisheries Management; 2) Exchange of experiences, lessons learnt and knowledge on fisheries and aquacultures and related topics through conferences, workshop, and meeting etc.; and 3) Support the Network for Promotion of Gender in Fisheries Management and Development in the Lower Mekong Basin (NGF). Her statement appears as **Annex 11**.

99. The Senior Analyst for the Swedish Agency for Marine and Water Management (SwAM), *Mr. Peter Funegård*, thanked SEAFDEC for the invitation to attend this Meeting. He informed the Program Committee that Sweden and SEAFDEC has an ongoing five-year collaborative project focusing on four areas, namely: 1) Coordination of Fisheries and Habitat Management; 2) Management of Fishing Capacity; 3) Destructive and Illegal (IUU) Fishing; and 4) Regional and Sub-regional Fisheries Management Mechanisms and Agreements. Focusing on four sub-regions in Southeast Asia, *i.e.* the Gulf of Thailand, Andaman Sea, Sulu-Sulawesi Seas, and the Mekong River Basin, the Project emphasizes on the sustainable use of marine and aquaculture resources including gender equality and rights, and the importance of working closely with the private sector in fishing and aquaculture as concrete measure towards long term sustainability. The Project also includes technical oriented development activities as well as policy making. The fundamental objectives behind the continued Swedish cooperation with SEAFDEC are two-pronged. First is to ensure that support is provided for the joint efforts of the Member Countries within the framework of regional cooperation and second, to reach out to and support relevant ASEAN working groups toward the ASEAN Community integration, and encourage the ASEAN Secretariat and Member States to be closely involved in the various programs and initiatives supported by Sweden, *i.e.* Mangrove for the Future (MFF), Bay of Bengal Large Marine Ecosystem (BOBLME) Project, and Mekong River Commission (MRC) to maximize the combined efforts from their initiatives. While looking forward to the successful work of SEAFDEC to enhance its contribution to the sustainability of ASEAN fisheries and aquaculture, he also noted the importance of the activities to be implemented within the context of the ASEAN Economic Community. His statement appears as **Annex 12**.

100. The Chief of Party of the ASEAN-U.S. Project on Maximizing Agriculture through Knowledge, Enterprise Development, and Trade (USAID MARKET Project), *Mr. Timothy P. Moore* informed the Program Committee on the collaborative arrangement between SEAFDEC and the USAID Market Project which is part of “Feed the Future,” the U.S. Government’s Global Hunger and Food Security Initiative, funded by the U.S. Agency for International Development (USAID). The Project is working with stakeholders in the ASEAN region to promote more sustainable and efficient use of aquaculture and fishery resources through multi-stakeholder dialogue and partnerships. SEAFDEC has served as a key technical partner for the Project since 2012 and will continue to be through the Project’s completion in March 2015. The collaboration has been demonstrated by strengthening the ASEAN Public-Private Taskforce for Sustainable Fisheries and Aquaculture (Taskforce) as an effective regional platform for public-private dialogue. He looks forward to continued collaboration with SEAFDEC on developing the direction and mechanism of the Taskforce beyond March 2015 and sharing lessons learned from the activities of the Taskforce’s initial phase. His statement appears as **Annex 13**.

101. As the representative from the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) was unable to attend the Meeting, SEAFDEC Secretariat made the presentation on the programs undertaken by SEARCA on Knowledge Management (KM) for Inclusive and Sustainable Agriculture and Rural Development in Southeast Asia. The Knowledge Management scheme of SEARCA revolves around the aspects of adaptive and social learning, knowledge sharing and use, and knowledge creation; and that SEARCA works to strengthen institutional capacities in Southeast Asia toward inclusive and sustainable agricultural and rural development (ISARD) through graduate education and institutional development, research and development, and knowledge management. In this connection, the Program Committee took note of the way forward to promote Knowledge Management in SEAFDEC and Member Countries as well as the possible establishment of future collaboration between SEAFDEC and SEARCA in the aspect of public education in conservation and sustainable use of fishery resources. The document appears as **Annex 14**.

## **VI. OTHER PROGRAM MANAGEMENT MATTERS**

### **6.1 Master Plan for SEAFDEC’s Strategic Plan of Operation (2015-2020)**

102. In the discussion of the request of the representative from Japan to delete Agenda 6.1 and WP06.1 on Master Plan for SEAFDEC’s Strategic Plan of Operation (2015-2020) as shown in **Annex 15**, the Program Committee noted that WP06.1 would only serve as internal working document to provide basis for future revision of the Plans of Operation and Programs of Work of SEAFDEC Departments as instructed by the SEAFDEC Council.

103. After discussion and deliberation, the Program Committee provided their comments as follows:

- The future functions of SEAFDEC in the “Master Plan” should be consistent with those stipulated in the Agreement establishing SEAFDEC, *e.g.* “surveillance” seems to be beyond the SEAFDEC functions;
- Wordings used in the “Master Plan” and the “Plans of Operation and Programs of Work” to be subsequently developed, should be carefully crafted, and should not go beyond the mandate and roles of SEAFDEC, *e.g.* “empower AMS”, etc.; and
- Subsequent development of the “Plans of Operation and Programs of Work” should take into consideration the priority issues and regional priorities agreed by the SEAFDEC Council.

104. The Program Committee was also informed that based on the “Master Plan for SEAFDEC’s Strategic Plan of Operation” and taking into consideration the recommendations of the Program Committee, the “Plans of Operations and Programs of Works of SEAFDEC Departments” would be developed and submitted for consideration by the SEAFDEC Council at its next meeting in 2015.

### **6.2 Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards**

105. The Program Committee took note of the document on Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards (**Annex 16**), and agreed in principle to adapt the format of SEAFDEC Project Document, and the Evaluation Form as suggested by the representative from Japan (**Annex 17**) to be used for monitoring and evaluation of SEAFDEC programs in the future.

### **6.3 Proposed Revision of Cost Sharing Policy and Proposed Chartering Policy for M.V. SEAFDEC 2**

106. The Program Committee took note of the Proposed Revision of the Guidelines on the Cost Sharing Policy for the Operation of the M.V. SEAFDEC, and provided their comments as follows:

- The maximum period for the operation of the M.V. SEAFDEC 2 in the national waters should not be limited to a maximum period of one month; and
- With regards to the basic data that should be shared with SEAFDEC/TD, example of such basic data should be specified in the footnote.

107. The Program Committee also took note of the Proposed Guidelines for Chartering/Renting of the M.V. SEAFDEC 2, and provided their comments as follows:

- Under Financial Scheme, “Surplus” should be changed to “Agency Cost”;
- Under Working Scheme (1), the phrase “where the agency belongs” should be deleted;
- Under Working Scheme, additional step should be added, *i.e.* to inform the Member Countries once SEAFDEC accepts the plan for chartering/renting out of the vessel;
- Written agreement should be prepared/signed between SEAFDEC and the agency requesting to charter/rent the vessel; and
- For chartering/renting of the vessel for usage beyond national jurisdictions of Member Countries, approval should be sought from the SEAFDEC Council (by *ad referendum*).

108. The recommendation from the Committee were accommodated as appear as **Annex 18** and **Annex 19** for further submission for the consideration of the SEAFDEC Council at its next meeting in 2015.

### **6.4 Others**

109. The Program Committee Member for Lao PDR informed the Program Committee that Lao PDR is planning to publish a compilation of inland fishing gears of the country, and requested SEAFDEC to provide technical support such as in the identification and classification of fishing gears, illustration of the gears and publishing of the compilation. He also requested SEAFDEC to provide continued assistance to Lao PDR in human resource development to facilitate information gathering through the introduction of community-based resources management and application of EAFM for inland fisheries.

## **VII. CONCLUSIONS AND RECOMMENDATIONS OF THE THIRTY-SEVENTH MEETING OF THE PROGRAM COMMITTEE**

### **7.1 Adoption of Report of the Meeting**

110. The Program Committee adopted its recommendations of the Thirty-seventh Meeting on 3 December 2014. The Program Committee also took note that the Report would be submitted to the 47<sup>th</sup> Meeting of SEAFDEC Council and to ASEAN through the 17<sup>th</sup> Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).

### **7.2 Date and Venue of the Thirty-eighth Meeting of the Program Committee**

111. In considering the date and venue of the Thirty-eighth Meeting of the Program Committee, the Chief of AQD informed the Program Committee that AQD would host the Thirty-eighth Meeting in the Philippines. He also informed the Program Committee that AQD would seek the guidance of the Secretariat in finalizing the schedule and related arrangements for the Meeting.

## **VIII. CLOSING OF THE MEETING**

112. In his Closing Remarks, the Chairperson of the Program Committee thanked the Program Committee Members, representatives of the organizations, SEAFDEC Secretariat and Departments, as well as observers for their active participation and contributions during the Meeting. He also thanked the Training Department for hosting the Meeting and the hospitality extended to all participants. He expressed appreciation to the Meeting secretariat staff for their efforts in making the Meeting a success. He then declared the Meeting closed. His closing address appears as **Annex 20**.





**LIST OF PARTICIPANTS**

**BRUNEI DARUSSALAM**

**Ranimah A. Wahab (Mrs.)**

Acting Deputy Director, SEAFDEC Alternate  
Council Director and SEAFDEC National  
Coordinator for Brunei Darussalam

Department of Fisheries  
Ministry of Industry and Primary Resources  
Muara Fisheries Complex, Simpang 287-53  
Jalan Peranginan Pantai Serasa  
Muara BT1728, Brunei Darussalam  
Tel: +673 2772787  
Fax: +673 2771063, 2770065  
E-mail: [ranimah.wahab@gmail.com](mailto:ranimah.wahab@gmail.com)

**Munah Haji Lampoh (Mrs.)**

Senior Fisheries Officer

Department of Fisheries  
Ministry of Industry and Primary Resources  
Muara Fisheries Complex, Simpang 287-53  
Jalan Peranginan Pantai Serasa  
Muara BT1728, Brunei Darussalam  
Tel: +673 2770066 to 67  
Fax: +673 2771063, 2770065  
E-mail: [munahlampoh@gmail.com](mailto:munahlampoh@gmail.com)

**CAMBODIA**

**Ing Try**

Deputy Director-General and SEAFDEC Alternate  
Council Director for Cambodia

Fisheries Administration, Cambodia  
#186 Preah Norodom Blvd.  
Chamcar Mon, P.O. Box 582,  
Phnom Penh, Cambodia  
Tel: +855 12 995665, +855 81676676  
E-mail: [ingtry@ymail.com](mailto:ingtry@ymail.com),  
[tmmp.cam@online.com.kh](mailto:tmmp.cam@online.com.kh)

**Dr. Em Puthy**

Deputy Director of Department of Planning,  
Finance and International Cooperation and  
SEAFDEC National Coordinator for Cambodia

Fisheries Administration, Cambodia  
#186 Preah Norodom Blvd.  
Chamcar Mon, P.O. Box 582,  
Phnom Penh, Cambodia  
Tel: +855 16850003  
E-mail: [emputhy@yahoo.com](mailto:emputhy@yahoo.com),  
[drputhy@gmail.com](mailto:drputhy@gmail.com)

**INDONESIA**

**Elvi Wijayanti (Ms.)**

Deputy Director for Multilateral Cooperation

Center of Analysis for International Marine and  
Fisheries Cooperation  
Ministry of Marine Affairs and Fisheries  
Mina Bahari Building I, 1<sup>st</sup> Floor  
Jl. Medan Merdeka Timur No. 16  
Jakarta 10110, Indonesia  
Tel: +62 81291417827  
Fax: +62 21 3864293  
E-mail: [multilateralmmmaf@yahoo.com](mailto:multilateralmmmaf@yahoo.com);  
[elviwijayanti@yahoo.com](mailto:elviwijayanti@yahoo.com)

**Aniza Suspita (Ms.)**  
Assistant Deputy Director for ASEAN  
Cooperation

Center of Analysis for International Marine and  
Fisheries Cooperation  
Ministry of Marine Affairs and Fisheries  
Mina Bahari Building I, 1<sup>st</sup> Floor  
Jl. Medan Merdeka Timur No. 16  
Jakarta 10110, Indonesia  
Tel: +62 81806561532  
Fax: +62 21 3864293  
E-mail: [asuspita@yahoo.com](mailto:asuspita@yahoo.com)

#### JAPAN

**Hidenao Watanabe**  
Director, Overseas Fisheries Cooperation Office,  
International Affairs Division

Fisheries Agency of Japan  
1-2-1, Kasumigaseki, Chiyoda-ku  
Tokyo, Japan  
Tel: +81 3 67442367  
Fax: +81 3 35020571  
E-mail: [Hidenao\\_watanabe@nm.maff.go.jp](mailto:Hidenao_watanabe@nm.maff.go.jp)

**Kiyoshi Ikoma**  
Technical Official, Overseas Fisheries  
Cooperation Office, International Affairs Division

Fisheries Agency of Japan  
1-2-1, Kasumigaseki, Chiyoda-ku  
Tokyo, Japan  
Tel: +81 3 67442367  
Fax: +81 3 35020571  
E-mail: [kiyoshi\\_ikoma@nm.maff.go.jp](mailto:kiyoshi_ikoma@nm.maff.go.jp)

#### LAO PDR

**Akhane Phomsouvanh**  
Deputy Director of Fisheries Division and  
SEAFDEC National Coordinator for Lao PDR

Department of Livestock and Fisheries  
P.O. Box 6644, Vientiane 01000  
Lao PDR  
Tel/Fax: +856 21 217869  
E-mail: [akhane@live.com](mailto:akhane@live.com)

#### MALAYSIA

**Ahmad Hazizi bin Aziz**  
SEAFDEC National Coordinator for Malaysia and  
Director of Planning and Development and Acting  
Director of Fisheries Biosecurity

Department of Fisheries Malaysia  
3<sup>rd</sup> Floor Podium 2, Block 4G2, Wisma Tani,  
Precinct 4, Federal Government  
Administrative Centre 62628,  
Putrajaya, Malaysia  
Tel: +603 88704707  
Fax: +603 88893794  
E-mail: [ziziawaameen@yahoo.com](mailto:ziziawaameen@yahoo.com) ,  
[ahazizi@dof.gov.my](mailto:ahazizi@dof.gov.my)

**Raja Yana Maleessa binti Raja Haroon  
Arashid (Mrs.)**

Department of Fisheries Malaysia  
2<sup>nd</sup> Floor Tower, Block 4G2, Wisma Tani Precinct  
4, Federal Government  
Administrative Centre 62628,  
Putrajaya, Malaysia  
Tel: +604 626 3925  
Fax: +604 626 2210  
E-mail: [ryanamel@gmail.com](mailto:ryanamel@gmail.com),  
[rajayana@dof.gov.my](mailto:rajayana@dof.gov.my)

## MYANMAR

**Dr. Kyaw Kyaw**  
Assistant Director and SEAFDEC National  
Coordinator for Myanmar

Department of Fisheries  
Ministry of Livestock, Fisheries and Rural  
Development  
Building No.(36), Ministerial Zone  
Nay Pyi Taw, Myanmar  
Tel: +95 9 250189720, +95 67408059  
E-mail: kyaw.72@gmail.com

## PHILIPPINES

**Rafael V. Ramiscal**  
Officer-In-Charge, Capture Fisheries Division

Bureau of Fisheries and Aquatic Resources  
PCA Building, Elliptical Road  
Quezon City, Philippines  
Tel: +63 2 9294296  
E-mail: rr\_ram55@yahoo.com

## SINGAPORE

**Lim Huan Sein**  
Director, Aquaculture Technology Department  
and SEAFDEC National Coordinator for  
Singapore

Agri-Food & Veterinary Authority of Singapore  
5 Maxwell Road, #01-01 Tower Block  
MND Complex, Singapore 069110  
Tel: +65 63257323  
Fax: +65 63257677  
E-mail: lim\_huan\_sein@ava.gov.sg

## THAILAND

**Chuanpid Chantarawarathit (Mrs.)**  
Chief of International Cooperation Group,  
Fisheries Foreign Affairs Division

Department of Fisheries  
50 Kaset Klang, Chatuchak  
Bangkok 10900, Thailand  
Tel: +66 25798214  
Fax: +66 25797939  
E-mail: chuanpidc@gmail.com

**Lukhana Boonsongsrikul (Mrs.)**  
Chief of ASEAN Group,  
Fisheries Foreign Affairs Division

Department of Fisheries  
50 Kaset Klang, Chatuchak  
Bangkok 10900, Thailand  
Tel/Fax: +66 25797941  
E-mail: lukhanabssk@gmail.com

**Saowanee Tapleang (Ms.)**  
Fisheries Biologist, Practitioner Level,  
Fisheries Foreign Affairs Division

Department of Fisheries  
50 Kaset Klang, Chatuchak  
Bangkok 10900, Thailand  
Tel/Fax: +66 25797939  
E-mail: saowaneetg@gmail.com

## VIET NAM

**Nguyen Thi Trang Nhung (Mrs.)**  
Deputy Director, and SEAFDEC National  
Coordinator for Viet Nam

Fisheries Administration  
10 Nguyen Cong Hoan, Ba-Dinh,  
Hanoi, Viet Nam  
Tel: +84 912153865  
Fax: +84 4 38245120  
E-mail: trangnhungicd@gmail.com

**Nguyen Thanh Binh**  
Official

Fisheries Administration  
10 Nguyen Cong Hoan, Ba-Dinh,  
Hanoi, Viet Nam  
Tel: +84 4 38245374  
Fax: +84 4 38245120  
E-mail: ntbinh@mard.gov.vn

## **SEAFDEC**

### **Secretariat**

**Dr. Chumnarn Pongsri**  
Secretary-General and  
Chief of SEAFDEC/TD

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29405682  
Fax: +66 29406336  
E-mail: sg@seafdec.org

**Hajime Kawamura**  
Deputy Secretary-General and  
Deputy Chief of SEAFDEC/TD

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406331  
Fax: +66 29406336  
E-mail: dsg@seafdec.org

**Dr. Magnus Torell**  
Senior Advisor

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29551557  
Fax: +66 29406336  
E-mail: magnus@seafdec.org

**Dr. Somboon Siriraksophon**  
Policy and Program Coordinator

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406333  
Fax: +66 29406336  
E-mail: somboon@seafdec.org

**Nualanong Tongdee (Ms.)**  
Information Program Coordinator

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29551518  
Fax: +66 29406336  
E-mail: nual@seafdec.org

**Tsuyoshi Iwata**  
Technical Expert on Trust Fund Project

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406332  
Fax: +66 29406336  
E-mail: iwata@seafdec.org

**Akira Bamba**  
Assistant Trust Fund Manager

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406334  
Fax: +66 29406336  
E-mail: bamba@seafdec.org

**Pattaratjit Kaewnuratchadasorn (Ms.)**  
Program Manager

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406326  
Fax: +66 29406336  
E-mail: pattaratjit@seafdec.org

### Training Department

- Bundit Chokesanguan**  
Information and Training Division Head, and  
Special Departmental Coordinator  
P.O. Box 97, Phrasamutchedi Post Office,  
Samut Prakan 10290, Thailand  
Tel: + 66 24256120  
Fax : +66 24256110  
E-mail: bundit@seafdec.org
- Isara Chanrachkij**  
Fishing Gear Technology Section Head, Capture  
Fisheries Technology Division  
P.O. Box 97, Phrasamutchedi Post Office,  
Samut Prakan 10290, Thailand  
Tel: + 66 24256211  
Fax : +66 24256110 to 11  
E-mail: isara@seafdec.org
- Dr. Taweekiet Amornpiyakrit**  
Head, Fisheries Resource Enhancement Section,  
Coastal and Small-scale Fisheries Management  
Division  
P.O. Box 97, Phrasamutchedi Post Office,  
Samut Prakan 10290, Thailand  
Tel: + 66 24256100  
Fax : +66 24256110 to 11  
E-mail: taweekiet@seafdec.org
- Panitnard Taladon (Ms.)**  
Training and Extension Section Head, Information  
and Training Division  
P.O. Box 97, Phrasamutchedi Post Office,  
Samut Prakan 10290, Thailand  
Tel: + 66 24256100  
Fax : +66 24256110 to 11  
E-mail: Panitnard@seafdec.org

### Aquaculture Department

- Dr. Felix G. Ayson**  
Chief of SEAFDEC/AQD  
Main Office:  
Tigbauan Main Station (TMS)  
Tigbauan Iloilo 5021, Philippines  
Manila Office:  
Rm 102, G/F, PSSC Building  
Commonwealth Avenue  
Diliman, Quezon City 1101, Philippines  
Tel/Fax: +63 33 3307001 (Main Office)  
Tel/Fax: +63 2 9277825 (Manila Office)  
E-mail: fgayson@seafdec.org.ph
- Dr. Takuro Shibuno**  
Deputy Chief of SEAFDEC/AQD  
Main Office:  
Tigbauan Main Station (TMS)  
Tigbauan Iloilo 5021, Philippines  
Manila Office:  
Rm 102, G/F, PSSC Building  
Commonwealth Avenue  
Diliman, Quezon City 1101, Philippines  
Tel/Fax: +63 33 3307003 (Main Office)  
Tel/Fax: +63 2 9277825 (Manila Office)  
E-mail: tshibuno@seafdec.org.ph
- Belen O. Acosta (Mrs.)**  
Special Departmental Coordinator AQD  
Manila Office  
Rm 102, G/F, PSSC Building,  
Commonwealth Avenue,  
Diliman, Quezon City 1101, Philippines  
Tel: +63 2 9275542  
Fax: +63 2 9277825  
E-mail: bacosta@seafdec.org.ph

**Dr. Ma Junemie Hazel Lebata-Ramos**  
Research Division Head

Main Office:  
Tigbauan Main Station (TMS)  
Tigbauan 5021, Iloilo, Philippines  
Tel: +63 33 3307010  
Fax: +63 33 3307011  
E-mail: jlebata@seafdec.org.ph

**Dr. Mae DLR. Catacutan**  
Technology Verification and Demonstration  
Division Head

Tigbauan Main Station (TMS)  
Tigbauan 5021, Iloilo, Philippines  
Tel: +63 33 3307020  
Fax: +63 33 3307021  
E-mail: mrc@seafdec.org.ph

**Dr. Evelyn Grace DJ Ayson**  
Training and Information Division Head

Main Office:  
Tigbauan Main Station (TMS)  
Tigbauan 5021, Iloilo, Philippines  
Tel: +63 33 3307030  
Fax: +63 33 3307031  
E-mail: edjayson@seafdec.org.ph

### **Marine Fisheries Research Department**

**Yeap Soon Eong**  
Chief of SEAFDEC/MFRD

2 Perahu Road, Off Lim Chu Kang Road,  
Singapore 718915  
Tel: + 65 67907973  
Fax: +65 68613196  
E-mail: Yeap\_Soon\_Eong@ava.gov.sg

**Liu Yankai**  
Scientist

2 Perahu Road, Off Lim Chu Kang Road,  
Singapore 718915  
Tel: + 65 67907973  
Fax: +65 68613196  
E-mail: Liu\_Yankai@ava.gov.sg

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

**Mahyam Mohd Isa (Ms.)**  
Chief of SEAFDEC/MFRDMD

Taman Perikanan Chendering  
21080 Kuala Terengganu,  
Terengganu, Malaysia  
Tel: +60 9 6175940  
Fax: +60 9 6175136  
E-mail: mahyam@seafdec.org.my

**Dr. Masaya Katoh**  
Deputy Chief of SEAFDEC/MFRDMD

Taman Perikanan Chendering  
21080 Kuala Terengganu,  
Terengganu, Malaysia  
Tel: +60 9 6175940  
Fax: +60 9 6174042  
E-mail: katoh@seafdec.org.my

**Raja Bidin bin Raja Hassan**  
Special Departmental Coordinator

Taman Perikanan Chendering  
21080 Kuala Terengganu,  
Terengganu, Malaysia  
Tel: +60 9 6175940  
Fax: +60 9 6175136  
E-mail: rbidin@seafdec.org.my

**Inland Fishery Resources Development and Management Department**

**Budi Iskandar Prisantoso**  
Chief of SEAFDEC/IFRDMD and  
Director for Research Institute for Inland  
Fisheries

c/o Research Institute for Inland Fisheries  
Agency of Research and Development Marine and  
Fisheries  
Jl. Beringin no. 308  
Mariana-Palembang-30763  
South Sumatra, Indonesia  
Tel: +62 813 72408262  
Fax: +62 711 7537205  
E-mail: budi.prisantoso@gmail.com

**Dr. Dina Muthmainnah**

c/o Research Institute for Inland Fisheries  
Agency of Research and Development Marine and  
Fisheries  
Jl. Beringin no. 308  
Mariana-Palembang-30763  
South Sumatra, Indonesia  
Tel: +62 711 7537193  
Fax: +62 711 7537205  
E-mail: dina.gofar@yahoo.co.id

**OBSERVERS**

**Food and Agriculture Organization of the United Nations (FAO)**

**Dr. Simon Funge-Smith**  
Senior Fishery Officer

FAO Regional Office for Asia and the Pacific  
39 Phra Atit Road,  
Bangkok 10200, Thailand  
Tel: +66 26974149  
Fax: +66 26974445  
E-mail: Simon-FungeSmith@fao.org

**Mekong River Commission (MRC)**

**Dr. Malasri Khumsri**  
Fisheries Management and Government Specialist

MRC Fisheries Program  
Operation Division  
Phnom Penh, Cambodia  
E-mail: malasri@mrcmekong.org

**Network of Aquaculture Centres in Asia-Pacific (NACA)**

**Dr. Cherdsak Virapat**  
Director General

Office Address:  
Suraswadi Building, Department of Fisheries  
Kasetsart University Campus  
Ladyao, Jatujak, Bangkok 10900  
Thailand

Mailing Address:  
NACA P.O. Box 1040  
Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: +66 25611728 ext. 117  
Fax: +66 25611727  
E-mail: cherdsak.virapat@enaca.org



**Swedish Agency for Marine and Water Management (SwAM)**

**Peter Funegård**  
Senior Analyst, International Coordination Unit  
Box 119 30  
SE 404 39 Göteborg, Sweden  
Tel: +46 10 6986000  
E-mail: peter.funegard@havochvatten.se

**Lars Johansson**  
Box 119 30  
SE 404 39 Göteborg, Sweden  
Tel: +46 10 6986000

**The United States Agency for International Development/Maximizing Agricultural Revenue through Knowledge, Enterprise Development and Trade Project (USAID/MARKET)**

**Timothy Moore**  
Chief of Party  
Kenan Institute Asia Office  
Queen Sirikit Convention Center  
2<sup>nd</sup> Fl, Zone D, Room 201/2  
60 New Ratchadapisek Road, Klong Toi  
Bangkok 10110, Thailand  
Tel: +66 92 7296542  
E-mail: tmoore@nathaninc.com

**The United States Agency for International Development's Regional Development Mission for Asia (USAID/RDMA)**

**Renerio B. Acosta**  
Regional Environment Advisor  
Athenee Tower 25<sup>th</sup> Floor,  
Wireless Road, Lumpini  
Patumwan, Bangkok  
Thailand  
Tel: +66 2 2573285  
E-mail: racosta@usaid.gov

**Timor-Leste**

**Augusto Fernandes**  
National Director for Fisheries and Aquaculture  
Rua Presidense Nicolau Lobata  
Dili, Timor-Leste  
Tel: +67 077312322  
E-mail: fernandesa50@yahoo.com

**SEAFDEC Regional Fisheries Policy Network (RFPN)**

**Chin Leakhena (Ms.)**  
RFPN Member for Cambodia  
SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406326  
Fax: +66 29551602  
E-mail: chin@seafdec.org

**Indry Zaini (Ms.)**  
RFPN Member for Indonesia  
SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406326  
Fax: +66 29551602  
E-mail: indry@seafdec.org

**Chainuek Phakhounthong**  
RFPN Member for Lao PDR

SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406326  
Fax: +66 29551602  
E-mail: chainuek@seafdec.org

**Hemalatha a/p Raja Sekaran (Ms.)**  
RFPN Member for Malaysia

SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406326  
Fax: +66 29551602  
E-mail: hemalatha@seafdec.org

**Dr. Myo Min Hlaing**  
RFPN Member for Myanmar

SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406326  
Fax: +66 29551602  
E-mail: myo@seafdec.org

**Efren V. Hilario**  
RFPN Member for Philippines

SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406326  
Fax: +66 29551602  
E-mail: efren@seafdec.org

**Nichaphat Dissayaphong (Ms.)**  
RFPN Member for Thailand

SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406326  
Fax: +66 29551602  
E-mail: nichaphat@seafdec.org

**Hoang Nguyen**  
RFPN Member for Viet Nam

SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Tel: + 66 29406326  
Fax: +66 29551602  
E-mail: hoang@seafdec.org

**Technical Secretaries**

**Virgilia T. Sulit (Mrs.)**  
Fisheries Technical Officer

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
E-mail: sulit@seafdec.org

**Sawitree Chamsai (Ms.)**  
Policy and Program Officer-I

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
E-mail: sawitree@seafdec.org

**Suwanee Sayan (Ms.)**  
Policy and Program Officer-II

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
E-mail: suwanee@seafdec.org

**Saivason Klinsukhon (Ms.)**  
Information Officer-I

P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
E-mail: saivason@seafdec.org

**Secretariat of the Meeting**

Saowanee Wanothayarnchai (Mrs.)  
Julasak Markawat  
Nathacha Sornvaree (Mrs.)  
Namfon Imsamrarn (Ms.)  
Sonthikan Soetpannuk  
Wasit Yimnoi

saowanee@seafdec.org  
julasak@seafdec.org  
natha@seafdec.org  
namfon@seafdec.org  
sonthikan@seafdec.org  
wasit@seafdec.org

## OPENING REMARKS

*By Dr. Chumnarn Pongsri*  
SEAFDEC Secretary-General

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

Good morning and welcome to the Thirty-seventh Meeting of SEAFDEC Program Committee in this beautiful and historic capital city of Ubon Ratchathani also known as the royal lotus city. Before we start this Meeting, I would like to extend our gratitude to the Training 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, to continue with the business of this Meeting, please allow me to inform you about the sequence of our main discussion. As before, we would start with the Programs under the FCG/ASSP Mechanism followed by Departmental Programs and Other Programs. The Programs under the FCG/ASSP Mechanism have been grouped accordingly under the Program Thrusts of the SEAFDEC Program Framework adopted by the SEAFDEC Council in 2009. Moreover, review of one Special Project and the proposed New Projects for 2015 also forms part of the Agenda of this Meeting.

The Program Committee is therefore encouraged to closely examine the various activities under the programs and to make comments on the progress of the implementation of the activities in terms of attaining the desired objectives and goals. As stipulated in its Terms of Reference, the SEAFDEC Program Committee is tasked to evaluate the programs and activities of SEAFDEC to make sure that these dovetail towards addressing the needs of the Member Countries. On behalf of the SEAFDEC Secretariat and Departments, we would like to assure you that we would always welcome your advice and suggestions for the improvement of our programs and activities to make these more suitable to the requirements of the Member Countries. We also welcome the comments of our collaborating partners on our programs and activities as their insights could lead to stronger cooperation, prevent duplication of efforts, and maximize the benefits that our programs and activities could provide to the countries in the region.

As you may be already aware of, we have been closely following-up with the instructions of the SEAFDEC Council and making adjustments as necessary in our activities especially with respect to the efficient and effective management of the Center.

Firstly, a series of discussions with the Member Countries had been convened for the countries to identify their requirements and priorities which SEAFDEC had been using as basis for program formulation. Secondly, consultations have also been conducted with the Departments to ensure that such requirements and priorities are considered in their respective programs and activities, as well as for the better management of SEAFDEC based on the instructions of the SEAFDEC Council.

The most recent of such consultations was the interdepartmental workshop in early October 2014 to discuss the future direction of SEAFDEC taking into consideration the priority areas that had been agreed by the SEAFDEC Council. The Master Plan for SEAFDEC Strategic Plan of Operation for 2015 to 2025, which was an important output of such consultation, is being put forward during this Program Committee Meeting for the Program Committee Members to evaluate and provide useful recommendations. Once endorsed, the Master Plan will be used as basis for the formulation and/or revision of the Departments' Plans of Operation and Programs of Work as required by the SEAFDEC Council of Directors.

Another issue that would need careful discussion at this Meeting is related to the Monitoring and Evaluation of SEAFDEC Programs for 2015 and onwards, which is another requirement of the SEAFDEC Council. We therefore expect that this Meeting would be an opportune time for us to discuss these matters and come up with suggestions that would warrant the attention and consideration of the SEAFDEC

Council during its forthcoming 47<sup>th</sup> Meeting in 2015. With such heavy work ahead of us, our schedule from today until Wednesday would surely be very hectic.

Nevertheless Ladies and Gentlemen, please let me reiterate that during the review of our programs and activities, as well as on other relevant issues and concerns, the 2011 Resolution and Plan of Action, the needs of the Member Countries, as well as the policy directives given by the SEAFDEC Council, should be taken into consideration. As a matter of fact and following processes and protocols, the output 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 ASWGFi as appropriate, through the Seventeenth Meeting of the FCG/ASSP which would be convened immediately after this Program Committee Meeting.

At this juncture Ladies and Gentlemen, we are therefore asking for your utmost cooperation and active participation in the discussions during the Meeting. Your inputs are very crucial for this Meeting to come up with concrete results that would pave the way towards greater success of SEAFDEC in the years to come.

With that, Ladies and Gentlemen, I now declare the Thirty-seventh 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 2014 and Proposed Programs for the Year 2015

### **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*

- Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds through Resources Enhancement
- Human Resource Development (HRD) Program on for Fisheries Management Approach for Sustainable Fisheries
- Optimizing Energy Use/Improving Safety Onboard in Fishing Activities
- Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release
- Promotion of Sustainable and Region-oriented Aquaculture

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

- Chemical and Drug Residues in Fish and Fish Products in Southeast Asia “Biotoxin Monitoring in ASEAN”: ASP, AZA and BTX
- Traceability Systems for Aquaculture Products in Southeast Asian Region
- Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia
- Food Safety of Aquaculture Products in Southeast Asia

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

- Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI)
- 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
- Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters
- 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 and Management of Sharks and Rays in the Southeast Asian Waters

### 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 Fisheries-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 Project starting from 2015

- Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region (AQD)
- Environment-Friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources (AQD)
- Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region (MFRDMD/TD)
- Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/fishing Grounds in Southeast Asia (TD)
- Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia (IFRDMD)
- Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia (IFRDMD)
- Cold Chain Management of Seafood (MFRD/AVA)

## 3.2 Departmental Programs

### 3.2.1 Aquaculture Department

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

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

- Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (ASEC/IDB/SEAFDEC)
- Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (UNEP/GEF/SEAFDEC)

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

**Agenda 6:** Other Program Management Matters

- 6.1 Master Plan for SEAFDEC's Strategic Plan of Operation (2015-2025)
- 6.2 Monitoring and Evaluation of SEAFDEC Programs for 2015 and Onwards
- 6.3 Proposed revision of Cost Shared Policy and Proposed Chartering Policy for M.V. SEAFDEC 2
- 6.4 Others

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

- 7.1 Adoption of Report of the Meeting
- 7.2 Date and Venue of the Thirty-eight 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 2014-2015**

**I. Existing Programs**

Program Thrust/ Project Title	Lead Department	2014	2015	Appendix No.
<b>Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation &amp; Food Security</b>				
Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds through Resources Enhancement	TD	Y	N	1
Human Resource Development for Sustainable Fisheries	TD	Y	Y	2
Optimizing Energy Use/Improving Safety Onboard in Fishing Activities	TD	Y	Y	3
Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release	AQD	Y	N	4
Promotion of Sustainable and Region-oriented Aquaculture	AQD	Y	N	5
<b>Thrust II: Enhancing Capacity &amp; Competitiveness to Facilitate International and Intra-regional Trade</b>				
Chemical and Drug Residues in Fish and Fish Products in Southeast Asia "Biotxin Monitoring in ASEAN": ASP, AZA and BTX	MFRD	Y	Y	6
Traceability Systems for Aquaculture Products in Southeast Asian Region	MFRD	Y	N	7
Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia	AQD	Y	N	8
Food Safety of Aquaculture Products in Southeast Asia	AQD	Y	N	9
<b>Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries</b>				
Strategies for Trawl Fisheries By-catch Management (FAO-GEF/REBYC-II CTI)	TD	Y	Y	10
Promotion of Countermeasures 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
<b>Thrust IV: Providing Policy &amp; Advisory Services for Planning &amp; Executing Management of Fisheries</b>				
Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2	TD	Y	Y	13
Off shore Fisheries Resources Exploration in Southeast Asia	TD	Y	Y	14
Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters	MFRDMD	Y	N	15
Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region	TD	Y	Y	16
Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	TD	Y	Y	17
Research and Management of Sharks and Rays in the Southeast Asian Waters	MFRDMD	Y	N	18
<b>Thrust V: Addressing International Fisheries Related Issues from a Regional Perspective</b>				
Assistance of Capacity Building in the Region to Address International Trade Related Issues	SEC	Y	Y	19
Strengthening SEAFDEC Network for Sustainable Fisheries	SEC	Y	Y	20

## II. Special 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	21

Y = Program proposed/implemented during the year

N = Program not proposed/implemented during the year

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 01201001			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds through Resources Enhancement		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	5 years (2010-2014)
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	Thailand
<b>Project Sponsor:</b>	Japanese Trust Fund	<b>Project Partner:</b>	SEAFDEC Member Countries
<b>Proposed Budget:</b>	USD 346,910	<b>This year budget:</b>	[2014] USD 53,710
<b>Prepared by</b>	T. Yuttana/CSFDH/TD	<b>Project Leader</b>	T. Yuttana/CSFDH/TD

## 1. INTRODUCTION/BACKGROUND

The quality of coastal and inshore ecosystems has deteriorated significantly as a result of continued and increasing human activities. These areas are critical to a broad range of aquatic organisms during their life cycles including spawning, nursery and feeding zones, and many of these species are of economic importance. The areas serve as important sources of recruitment to and the sustainability of, commercial fisheries. The productivity of these ecosystems can be enhanced through human intervention leading to improved livelihoods for coastal communities. Immediate action is imperative to prevent further loss of habitat and damage to fish stocks. A range of effective community-level mechanisms must be developed to assist fishers to restore habitats and rebuild stocks, but such mechanisms are likely to be specific to different stocks and habitats.

TD will be the responsible SEAFDEC Department for this project and will manage and coordinate all project activities. Other ASEAN member states identified as core countries will be involved in implementing the relevant project activities on a cost-sharing basis under the project on Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement and in conducting pilot projects to implement the program in their respective countries.

The project involves identification of appropriate resource enhancement tools for the region in order to develop management measures and formulate strategies as well as guidelines through regional consultative meetings. Regional training programs would also be conducted to build up the capacity of the ASEAN member states in the promotion of sustainable fisheries resources enhancement. Project monitoring and evaluation are part of the project activities, the results of which would be included in annual progress reports, and presented in end-of activity workshops.

## 2. PROJECT

### 2.1 Goal/Overall Objectives and Performance Indicators

This project on “Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds through Resources Enhancement” is being proposed to ensure that:

- 1) Results of the investigation and diagnosis of the status of fishery resource in critical fishing grounds and fishery *refugia* sites are used to develop resource enhancement tools for the countries to adapt;
- 2) The feasibilities and environmental/socio-economical impacts of such resource enhancement practices are made known to the stakeholders in the countries; and
- 3) Experiences and lessons learnt are used as reference in the development of a regional management approach for coastal fisheries in rehabilitated habitats in ASEAN Member States.

## 2.2 Expected Outcomes and Outputs

During the fourth year of the project, diagnostic methods for critical fishing grounds would be developed and the adoption of resources enhancement practices would be evaluated. This would be done with the technical assistance of governments in respective pilot project sites and is expected to come up with suitable resources enhancement practices. The results and information on rehabilitation of fisheries resources and habitat/fishing grounds would be disseminated to the ASEAN Member States, and the progress of the implementation of the strategies in pilot project sites would be evaluated to serve as inputs in the proposed guidelines.

The expected outputs of the project include strategies for implementing resources enhancement programs to promote sustainable fisheries resources enhancement, and the capacity of human resources in ASEAN member states is enhanced to enable them to implement such resources enhancement programs. Results from a series of surveys conducted earlier and the practices developed in 2010-2012 could be used as reference in addressing possible distinct results and views.

From the strategies that had been developed and the experiences of the pilot project sites in implementing the strategies would be used in the development of the guidelines for implementing resources enhancement programs to promote sustainable fisheries resources enhancement. The project would also continue to develop the capacity of human resources in ASEAN member states for them to implement the resources enhancement programs.

## 2.3 Project Description/Framework

The project will be implemented through the following activities and sub-activities:

**Activity 1:** Development of methods for diagnosing critical fishing grounds and evaluation of resources enhancement practices

**Sub-Activity 1.1** Investigation/review of the status of critical fishing grounds in the Southeast Asian region

Investigation of the existing basic information and research works in identifying critical fishing grounds as well as spawning and nursery grounds known also as “Fishery *Refugia*” for commercial fishes including bottom and pelagic species, will be conducted. Meanwhile, compilation of relevant information would be carried out through deskwork and confirmed through visits to the ASEAN member states. The information compiled would be analyzed to be used in mapping the critical fishing grounds and developing the indicators for assessing the status of critical fishing grounds in the region.

**Sub-Activity 1.2** Information collection on suitable designs of resource enhancement practices including their evaluation and promotion

Assessment of existing information and research works on effective designs/models and methodologies for the resource enhancement tools/practices used in various fisheries habitat will be carried out. Information collection would be conducted through deskwork and experiments on designs/models.

**Sub-Activity 1.3** Workshop/Expert consultation on resource enhancement practices

This includes a series of workshops as well as expert consultations to identify appropriate and effective resources enhancement tools for various fishery habitats. The results would be compiled into a collection of tools and measures that could be adapted in pilot projects to determine the best tools and practices.

**Sub-Activity 1.4** Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach

Workshops/expert consultative meetings will be convened to identify critical fishing grounds and fishery *refugia* in the region and approaches would be compiled based on recommendations during the organized regional workshops. Local people’s indigenous knowledge would be shared and their participation enhanced during the workshops, as these are major factors that could bring about and sustain an active

fisheries habitat rehabilitation and management program. Scientific data and information would be supported by the views of the local people who are known to have the right means or methods to strengthen their activities.

**Activity 2:** Technical assistance for pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds

**Sub-Activity 2.1** Technical assistance in pilot sites for development of suitable designs of resource enhancement practices

Selected sites would conduct on-site study and evaluation of enhancement practices including impacts of artificial reefs to fisheries resources and the environment, for example in Rayong Province, Thailand.

**Sub-Activity 2.2** Technical assistance in pilot sites for diagnosing fishing grounds and evaluation of fishery ecosystem management

In order to develop the strategies and actions for rehabilitating critical fishing grounds as practical management measures, critical fishing grounds will be selected for diagnosing their status and monitoring the achievements of rehabilitation programs in selected pilot sites such as sea grass beds for dog conch in Krabi Province, Thailand.

Case studies would be conducted on selected priority important fisheries ecosystem that had been identified and evaluated in cooperation with the ASEAN member states. This would include a case study to be carried out by SEAFDEC on the identification and evaluation of fisheries ecosystem in freshwater reservoirs, such as in Nam Haum, Lao PDR.

**Sub-Activity 2.3** Capacity building on rehabilitation practices for fisheries resources and habitats/fishing grounds

Capacity building on rehabilitation practices for fisheries resources and habitats/fishing grounds would be provided through a training course and study trips to promote the practices both in terms of technical and management aspects to the ASEAN member states. This is aimed at enhancing their capacities and awareness of the various practices on rehabilitation of fishery resources and habitats/fishing grounds.

**Sub-Activity 2.4** Capacity building on identification of critical fishing grounds and regional habitat rehabilitation and management approach

Regional training course would be organized to strongly support the transfer of assistance both in terms of technical and management aspects, and promote the enhancement of fisheries habitat in the ASEAN member states, as well as improve their capacities in the preservation and rehabilitation of critical fishing grounds and fishery *refugia*.

**Activity 3:** Promotion and extension of rehabilitation measures for fisheries resources and habitat/ fishing grounds in the ASEAN Member States

**Sub-Activity 3.1** Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness

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.

**Sub-Activity 3.2** Regional seminar as end of the project activity

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2014

#### 3.1 Activities Achievements in the Year 2014

Achievements based on Activities	Duration	Remarks
<p><b>Activity 2.</b> Technical assistance for pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds</p> <p><b>Sub-Activity 2.1</b> Technical assistance in pilot sites for suitable designs of resource enhancement practices</p> <p>A series of surveys in selected sites will be conducted onsite to study and evaluate enhancement practices including impacts of artificial reefs to fisheries resources and the environment. This has been being carried out in Rayong Province, where installation of Fish/Resource Enhancing Devices (FEDs) in the artificial reefs has been conducted to enhance the fish habitats.</p> <p><b>Sub-Activity 2.2</b> Technical assistance in pilot sites for diagnosing fishing grounds and evaluation of fishery ecosystem management</p> <p>A pilot site has been selected for diagnosing fishing grounds and monitoring the achievements of rehabilitation programs in sea grass beds in Krabi Province (Andaman Sea), Thailand. As a follow-up, activities are being conducted on sea grass beds for dog conch shell conservation and rehabilitation in Sriboya Island, Krabi Province, Thailand.</p> <p>The second seminar on dog conch shell resource management measures in the Andaman Sea was organized in Krabi Province, Thailand on 20 August 2014.</p> <ul style="list-style-type: none"> <li>- Attended by 70 participants from stakeholders (representatives from 6 provinces in the Andaman Sea, namely; Krabi, Pang Nga, Phuket, Trang, and Satun Provinces), Thai DOF and SEAFDEC/TD officers, the Seminar came up with the following recommendations:</li> <li>- Harvesting of under-sized dog conch shell (&lt; 6 cm) should be banned</li> <li>- Only hand collecting of dog conch shell is allowed, and the use of dredges or net with or without motorized boat is prohibited</li> <li>- Air supplied equipments or tanks to collect the dog conch is also prohibited</li> <li>- Declaration of conservation areas for dog conch shell should be made for each area</li> <li>- Conservation zone for dog conch shell in sea-grass beds should be declared and enforced</li> <li>- Posters, brochures and stickers on dog conch shell conservation should be promoted in public markets, tourist restaurants and fishing villages</li> </ul> <p>Permanent dog conch shell conservation areas were established by local fishing communities at Sriboya Island, Krabi Province, and Muk Island, and Trang Province. Conservation area at Sarai Island, Satul Province is under consideration by local fishing communities for area demarcation.</p>	<p>20 August 2014</p>	
<p>Technical assistance in pilot sites for suitable designs of resource enhancement practices has been extended to Lao PDR. Nam Houm Reservoir was selected as a pilot site for the case study on the identification and evaluation of fisheries ecosystem in freshwater ecosystem. Promotion of releasing silver-barb seeds produced in mobile-hatcheries was carried out.</p>	<p>20-26 Jan. 2014</p>	
<p>Demonstration and training on construction and deployment of fish apartments and shelters for protection of brood-stock were conducted in the reservoir. The survey conducted includes investigation of the compositions of fish species caught by gill net and trammel net operations, fish larvae samples, and fish landings as well as discussions with local fishermen and fisheries officers to confirm the survey results.</p>	<p>20-26 Jul. 2014</p>	

### 3.2 Evaluation of the Project Outcomes Till the Year 2014

#### 3.2.1 Theme/Program Thrust and Issues:

**(1) Theme/Program Thrust:**

Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds through Resources Enhancement

**(2) Issues in the region at the beginning of the study:**

The quality of coastal and inshore ecosystems has deteriorated significantly as a result of continued and increasing human activities. These areas are critical to a broad range of aquatic organisms during their life cycles including spawning, nursery areas and feeding zones and many of these species are of economic importance. The areas serve as important sources of recruitment to and sustainability of commercial fisheries. Nevertheless, the productivity of these ecosystems can be enhanced through human intervention leading to improved livelihoods for coastal communities. Moreover, immediate action is necessary to prevent further loss of habitats and damage to fish stocks. A range of effective community-level mechanisms must be developed to assist fishers in restoring habitats and rebuilding the stocks, although it is recognized that such mechanisms are likely to be specific to different stocks and habitats.

#### 3.2.2 Expected Final Goals of the Project:

- Optimum utilization of fishing grounds by fishers after resource enhancement programs
- Human resources are capable of implementing the resource enhancement programs
- Guidelines for implementing resources enhancement programs developed, disseminated and adapted by the countries
- Strategies and action plans for rehabilitating selected critical fishing grounds are in place and adapted by the countries
- Enhanced cooperation and collaboration among ASEAN countries lead to improved capacity building in rehabilitation of critical fishing grounds
- Developed multifaceted fisheries habitat rehabilitation and management measures enhance the capability of fishing communities and increase their awareness on the importance of harmonizing sustainable fisheries management and environmental concerns
- Sustainable coastal fisheries and environment friendly practices are adopted by stimulating the community's initiatives in practicing coastal habitat rehabilitation and management, and making them aware of the applicable practices of responsible fisheries that are environment friendly

#### 3.2.3 "Steps" Toward Achieving Final Goal:

Step 1:

- Information survey & methods validation
- Case study in selected sites in Thailand (Rayong and Krabi Provinces), and Lao PDR (Nam Houm Reservoir)
- Workshops/Seminars

Step 2:

- Data analysis and evaluation
- Continue case studies in selected sites
- Workshops/seminars
- Technical transfer through capacity building in ASEAN countries

Step 3:

- Evaluation of the impacts of enhancement methodology to resources
- Updating baseline data
- Continue sample analyses and preparation/submission of reports
- Guidelines preparation /publication and dissemination



### 3.2.4 Activities in the Current Project:

<b>(1) Current position of the project:</b> (Step 2-3)
<b>(2) Program duration:</b> (2010-2014)
<b>(3) Main activities:</b> <ul style="list-style-type: none"> <li>- Development of methods for diagnosing critical fishing grounds and evaluation of resources enhancement practices</li> <li>- Technical assistance for pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds</li> <li>- Promotion and extension of rehabilitation measures of fisheries resources and habitat/ fishing grounds in the ASEAN member states</li> </ul>

### 3.2.5 Progress and Achievements of the Current Project:

<b>(1) Main activities conducted in the current project</b>	
<ol style="list-style-type: none"> <li>1. Investigation/review of the status of critical fishing grounds in the Southeast Asian Region</li> <li>2. Information collection on suitable designs of resource enhancement practices including their evaluation and promotion</li> <li>3. Workshop/Expert consultation on resource enhancement practices</li> <li>4. Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach</li> <li>5. Technical assistance in a pilot site for suitable designs of resource enhancement practices</li> <li>6. Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management</li> <li>7. Capacity building on rehabilitation practices of fisheries resources and habitats/fishing grounds</li> <li>8. Capacity building on identification of critical fishing grounds and on regional habitat rehabilitation and management approach</li> <li>9. Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness</li> <li>10. Regional seminar for ending of the project</li> </ol>	
<b>(2) Main achievements till the end of 2014 (tentative)</b>	
<ol style="list-style-type: none"> <li>1. Investigation /review of the present status of critical fishing grounds in the Southeast Asian Region</li> <li>2. Information collection on suitable designs of resource enhancement practices including their evaluation and promotion</li> <li>3. Workshop/Expert consultation on resource enhancement practices</li> <li>4. Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach</li> <li>5. Technical assistance in a pilot site for suitable designs of resource enhancement practices</li> <li>6. Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management</li> <li>7. Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness and through the region</li> </ol>	
<b>(3) Outcomes/Outputs during the project period and expected achievement rate till the end of 2014 (tentative)</b>	
<b>Expected outcomes/outputs</b>	<b>Achievement rate (%)</b>
- Optimum utilization of fishing grounds by fishers after resource enhancement programs	45%
- Human resources are capable of implementing the resource enhancement programs	50%
- Guidelines for implementing resources enhancement programs developed, disseminated and adapted by the countries	45%
- Strategies and action plans for rehabilitating selected critical fishing grounds are in place and adapted by the countries	40%
- Enhanced cooperation and collaboration among ASEAN countries lead to improved capacity building in rehabilitation of critical fishing grounds	55%

<p>- Developed multifaceted fisheries habitat rehabilitation and management measures enhance the capability of fishing communities and increase their awareness on the importance of harmonizing sustainable fisheries management and environmental concerns</p>	<p>45%</p>
<p>- Sustainable coastal fisheries and environment friendly practices are adopted by stimulating the community's initiatives in practicing coastal habitat rehabilitation and management, and making them aware of the applicable practices of responsible fisheries that are environment friendly.</p>	<p>60%</p>

### 3.2.6 Evaluation of Project Activities in 2014:

Investigations and inspection of the present status of critical fishing grounds (*e.g.* sea grass beds, artificial reefs, freshwater reservoirs) have been carried out for identification and diagnosis. Implementation of some rehabilitation and conservation measures has been promoted and carried out in the communities.

For marine resources, the selected sites (*e.g.* Sriboya Island, Krabi Province) are considered in the state of 'Degradation' and need to be conserved. The harvest of dog conch in sea grass beds are commonly practiced in the area both by hands and/or labor saving equipments such as motorized boats, dredges and nets. Such massive harvesting methods could easily induce drastic degradation not only of the habitats but also the populations of the sea grass and dog conch shell.

Promotion of conservation measures and optimum utilization of dog conch shell resources was conducted by increasing public awareness through a local workshop on resource management measures for dog conch shell in Andaman Sea conducted at Krabi Province, Thailand on 20 August 2014. Several management schemes were applied to the area such as limiting harvestable size, limiting the type of allowable fishing gear as well as banning the use of motorized boats to harvest the shell.

Several kinds of dog conch shell conservation awareness media such as posters, stickers, brochures and banners were distributed to all coastal areas in Andaman Sea. Permanent dog conch shell conservation areas were established by local fishing communities at Sriboya Island, Krabi Province, and Muk Island, Trang Province. Conservation area at Sarai Island, Satul Province and others areas are under consideration by concerned local fishing communities for area demarcation.

Sites in selected artificial reefs have been examined to assess their present condition, resource abundance, conditions of the structures and utilization by local fishers. In a man-made reservoir such as the Nam Houm Reservoir in Lao PDR, conservation areas have been declared and demarcated for nursery grounds. Training on operating a Mobile hatchery Unit to breed selected commercially important fish species (common silver barb, *Barbonymus gonionotus*) was conducted for the fishing communities around the Nam Houm Reservoir, Lao PDR as means of sustaining the livelihoods of fisher folks. A follow-up phase on nursery techniques was also conducted. Hands-on training to local fisheries officers and fishing communities on artificial fish shelter construction and installation in the conservation area of Nam Houm was conducted.

The next step to fulfill the goal is to evaluate the socio-economic impacts and feasibilities of developing regional management approach for the ASEAN region.

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 01201102			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Human Resource Development for Sustainable Fisheries		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	2013 - 2017
<b>Lead Department:</b>	TD	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	Japanese Trust Fund	<b>Total Donor Budget:</b>	USD 258,440
<b>Project Partner:</b>	None	<b>Budget for 2015:</b>	USD 51,700
<b>Project leader:</b>	Mr. Bundit Chokesanguan.		

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

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

With the aim to strengthen the understanding of fishery management officers in Member Countries on appropriate fisheries management for each specific areas/country through the use of existing tools, concepts and approaches on sustainable fishery management, SEAFDEC/TD proposes to carry out HRD program through the conduction of the regional training courses on the use of Ecosystem Approach to Fisheries Management (EAFM) and Extension Methodologies. The training course will be conducted using the training toolkits, which will be subsequently used by participants after completion of the training course to further apply and transfer their knowledge in their respective country.

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

In referring to the plan of action on Sustainable Fisheries for Food Security Towards 2020 which was adopted in ASEAN-SEAFDEC Conference Fish for the People 2020 “Adaptation to a Changing Environment” in Bangkok, Thailand during 13-17 June 2011 emphasizes; Accelerate the improvement of fisheries resource management activities with taking consideration of the ecosystem approach, for sustainable fisheries. SEAFDEC TD is taking this challenge and have conducted the regional training course on Essential EAFM and Extension Methodologies, which aims that the participants understand the concept and need for the Ecosystem Approach to Fisheries Management (EAFM) and should be able to transfer and apply the gained knowledge to fisheries management in their country.

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

#### **3.1 Expected Outcomes**

- 1) Build up/strengthen capacity and increase the number of trainers (government officers) who are strengthened on the knowledge/experience on sustainable fisheries management as well as be able to apply the existing concept, tools and approaches for sustainable fisheries management
- 2) Series/items of promotion materials (posters/cartoon booklets/VCD) which relevance to the sustainable fisheries management and will be widely distributed and make use to the region.

### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
<b>Outcome 1:</b> Target groups strengthened in sustainable fisheries management	<b>Output 1:</b> number of participants who would be strengthened in the sustainable fisheries management and be able to transfer and apply the knowledge	Regional and national training courses	A. Course assignment B. Course quiz C. Course evaluation through questionnaires and PRA methods
<b>Outcome 2:</b> Familiarize and use of training toolkits which related to the training courses as well as the promotion materials in the Member Countries	<b>Output 1:</b> Training toolkit and promotion materials	Production of training toolkit/module as well as the promotion materials	A. Series of training toolkits/handbooks/session plan and PowerPoint presentation B. Series of promotion materials on sustainable fisheries management and number of distribution

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1) Regional Training courses on sustainable fisheries management	The program proposes to conduct regional training courses for Human Resource Development on Sustainable Fisheries. The training courses will focus upon the application and the use of existing fisheries management concept, tools and approaches at the regional and national levels
2) Follow up activities and onsite training	The program proposes to be carried out in continuing to provide technical support and contribution to the member countries, the selection of the implementation countries will be based on the country's requirement, need and propose. Base on the onsite-training, these will be implemented in collaboration with the host governments which propose the onsite training activities under the cost sharing basis.
3) Production of promotional materials	The program proposes to produce promotion materials for sustainable fisheries management" such as posters, cartoon booklet this to enhance and strengthen awareness as well as to buildup understanding of the readers on the importance and approaches of sustainable fisheries management.

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

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
<b>Act. 1:</b> Regional Training course on Sustainable Fisheries Management						

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
	<b>Sub-activity 1.1:</b> 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				
	<b>Sub-activity 1.2:</b> Regional Training Course on Essential EAFM and Extension Methodologies		36,340	35,000		
<b>Act. 2:</b> Follow up activities and onsite training						
	<b>Sub-activity 2.1:</b> 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 - In Cambodia - In Vietnam	15,500 15,500				
	<b>Sub-activity 2.2:</b> Follow up and onsite training activity on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region - In Vietnam	12,000				
<b>Act. 3:</b> Production of promotional materials						
	<b>Sub-activity 3.1:</b> Development of training toolkit on fisheries extension methodologies			14,700		
	Sub-activity 3.2: Production of promotional materials	2,000	2,000	2,000		
	<b>Sub-total</b>	<b>65,000</b>	<b>38,340</b>	<b>51,700</b>	<b>51,700</b>	<b>51,700</b>

**PART II: PROPOSED ACTIVITIES FOR YEAR 2015****4. Proposed Activity/sub-activity, work plan and estimated budget for the year 2015**

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)				
Sub-Activity	Timeframe/ period	Inputs <sup>1</sup>	Type of Activity	Proposed Budget
<b>Activity 1:</b> Development of training toolkit on fisheries extension methodologies	5 months (March to July)	Internal and external resource persons	III (Information activity)	14,700
<b>Sub-activity 1.1</b> An in-house workshop for Outline of the training toolkit on Fishery Extension Methodologies	5 days in March	Internal and external resource persons		
<b>Sub-activity 1.2</b> Production of the training toolkit	3 Months	Subject outline and content of the training modules (Fishery extension Methodologies)		
<b>Sub-activity 1.3</b> An in house workshop to Finalize of the training toolkit	5 days in July	Internal and external resource persons		
<b>Sub-activity 2:</b> Regional Training Course on Essential EAFM and Extension Methodologies	15 days in October	Resource persons, trainers, training toolkits and modules (both E-EAFM and Fishery Extension Methodologies)	II (Training activity)	35,000
<b>Sub-activity 3:</b> Production of training materials on the use of Participatory Rural Appraisal (PRA) tools.	1 year		III (Information activity)	2,000

**PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION****5. Achievements of the Project Implementation for the Year 2014**

Regional training course on Essential EAFM and Extension Methodologies.  
The regional training course was conducted from 15-29 September 2014, there were 21 participants (2 from each country: Brunei Darussalam, Cambodia, Indonesia, Laos PDR, Myanmar, Philippines, and Vietnam including 2 from Thailand, 1 from Netherland and 4 from SEAFDEC/TD participated in the training course. Base on the course evaluation, participants were strengthen in the knowledge and skill on E-EAFM and fishery extension methodologies and most of them agreed that the knowledge they have gained from the course can be used to apply to their work which related to the fisheries management.

**5.1 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 (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1.1</b>					
Regional training course on Essential EAFM and Extension Methodologies	II Training	16	4	1	36,340

<sup>1</sup> The financial, human, material, technological and information resources used for development interventions

## 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Output 1:	(A) Course assignment	All participants completed their assignment with good output	
	(B) Course quiz	Most of participants passed the course quiz (average score is 85 % and highest is 98%)	
	(B) Course evaluation	Most of participants fulfilled with their expectation and achieved the course objectives	

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	Attached e-file
1. Summary of the course activities through the VDO	VDO	

## 5.3 Project Outcomes and Lesson Learned

For regional training course which much different in background, knowledge and language of participants, there are challenges to make most/all of participants achieve their course expectation and objectives, however, this difficulties can be reduced and the strengthen point can be pull out form the nature of the differences through the use of the adult learning process as well as the learning by doing styles. Each session seem to be needed some discussion and activities in relevance with each subject outline, this in order to melt out the unclear aspects as well as the knowledge and lesson learnt of each participant can be shared.

## 5.4 Major Impacts/Issues

Based on the review of the result in conducting the regional training course, as the course ran through 2 main parts of the course contents: 1) The E-EAFM, and 2) The Fishery Extension methodologies, we found out that at the 1<sup>st</sup> part, the participants could be easier followed the session if compare to the 2<sup>nd</sup> part and can be always refer to the training module/toolkits and materials whenever they need to and for the 2<sup>nd</sup> part which deal mainly on the fishery extension methodologies, participants agreed that this parts of the knowledge and skills are essential and useful for their work however, as this part still had no training module and toolkit except the power point presentation so that this will be an importance issue for the project to cope up with in order to make the course more beneficial and effective to the participants. So that the training toolkit and module on fishery extension methodologies planned to be produced in the first quarter of 2015.

## PART IV: EVALUATION

### 6. Project Evaluation

As the project still ongoing process so that the evaluation still not take place yet, however, base on the project monitoring we found out that the implemented activities are on the right direction in achieving of the overall project's goal and objectives. However, as there are still some points to be improved so that the project will further continue and make the adaptation of the lesson learnt from the previous activities in order to make the proposed activities of the year 2015 become more appropriate and effective.

Table 8 Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	-By conducted of the regional training course on E-EAFM and Extension Methodologies which focus upon the sustainable fisheries management	65%
<i>How well did the Results contribute to the Achievement of the project purpose/ objectives?</i>	- Increase in number of target participants who are equipped and strengthen with knowledge, experience and skill on E-EAFM and Extension Methodologies	55%
	- The trained participants be able to apply the gained knowledge to their sustainable fishery management activities	55%
<i>Which has benefited on society and sector?</i>	- Network which built up from each training courses	70%
<i>Have products and benefits been maintained?</i>	Yes	70%



**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 01201303
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Optimizing Energy Use/Improving Safety Onboard in Fishing Activities		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	2013 - 2017
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	
<b>Donor/Sponsor:</b>	Japanese Trust Fund	<b>Total Donor Budget:</b>	USD 219,000
<b>Project Partner:</b>		<b>Budget for 2015:</b>	USD 36,000
<b>Project leader:</b>	Mr. Suthipong Thanasansakorn (document prepared by Worawit Wanchana)		

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

In the Southeast Asian countries, the major concerns on the use of energy in fishing vessels 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 for fishing vessels that require minimum modification of their existing equipment to optimize energy used for fishing operation. Therefore, the main activities under the project include transferring appropriate ways to optimize the use of energy for fishing vessels as well as adjustment/improvement of current practices in the fishing vessels.

In the process of capturing fish, fuel cost takes up majority of operational costs, but we cannot find any alternative source of energy in the near future. In this connection, this project is aimed 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

In addressing the issues on optimizing energy and safety at sea for fishing vessels, the following paragraphs from the ASEAN-SEAFDEC Resolution and Plan of Action 2020, have been used as reference.

#### **Resolution:**

- #12 Support ASEAN efforts to promote low carbon development by minimizing the contribution of the fisheries sector to greenhouse gas emissions, with emphasis on ***promoting energy efficiency*** and use of alternative energy sources
- # 13 Improve the working conditions of people engaged in fisheries activities, and strengthen measures for ***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

The objectives of the project are to promote the transfer of appropriate knowledge, and enhance the awareness of stakeholders on optimizing energy use in fishing activities and promote safety at sea for small fishing vessels in the ASEAN Member States.

#### 3.1 Expected Outcomes

Fishers and fisheries officials of Member Countries are capable of transferring knowledge on optimizing energy and safety at sea to be applied for their fishing operations and practices through publications, training materials/package, and promotional materials disseminated during the course of the training program.

#### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Enhancement of knowledge and experience of ship owners, fisheries extension officer, and other key stakeholders (Indonesia and Philippines)	Output 1: Report of and feedback from the training organized in (Indonesia and Philippines)	Activity 1: Regional and national training on optimizing energy and safety at sea for fishing vessels	<ul style="list-style-type: none"> <li>- 30 participants attended the training, for a total of 60 participants for 2 countries, <i>i.e.</i> Indonesia and Philippines.</li> <li>- 2 resource persons from Fisheries Research Agency of Japan transferred knowledge and experiences based on current situation on optimizing energy and safety at sea for fishing vessels.</li> <li>- 5 resource persons from Training Department transferred their knowledge on optimizing energy and safety at sea for fishing vessels.</li> </ul>
Outcome 2: Enhancement of knowledge of key stakeholders on international, regional, and national references for improvement of optimizing energy use and safety at sea for fishing vessels (Indonesia and Philippines)	Output 2: Dissemination and understanding of international guidelines on optimizing energy and safety at sea by key stakeholders (in their respective national languages, <i>i.e.</i> Indonesia and Philippines)	Activity 2: Information dissemination	<ul style="list-style-type: none"> <li>- 100 sets of training materials are disseminated to the participants of the training, comprising 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.</li> </ul>

#### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
<b>Activity 1</b> Regional and national training/workshop on optimizing energy and	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

safety at sea for fishing vessels	international documents (guidelines, handbooks, handouts, etc.) on optimizing energy and safety at sea. Subsequently, the project translated the international guidelines, national guidelines, and other relevant training materials into national languages. Such training materials have been used for onsite training programs to enhance the awareness of fishers and fisheries officials (to further transfer the knowledge) on fuel efficiency and safety at sea for the fishing vessels.
<b>Activity 2</b> 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.

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

Table 3 Proposed Budget based on activity and sub-activity 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	31,000	31,000
	Sub-activity 1.2	0	30,000	0	0	0
Activity 2:		5,000	5,000	5,000	5,000	5,000
	<b>Sub-Total</b>	<b>36,000</b>	<b>75,000</b>	<b>36,000</b>	<b>36,000</b>	<b>36,000</b>

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/sub-activity, work plan and estimated budget for the year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs <sup>1</sup>	Type of Activity	Proposed Budget
Activity 1	January or February	1. FAO guidelines on safety at sea for small fishing vessels 2. FRA guidelines on optimizing energy for optimizing energy for fishing 3. SEAFDEC Handbooks based on lessons learned and experience from regional initiatives related to optimizing energy and safety at sea for fishing vessels in the member countries	Training	31,000
Activity 2	Jan. to Dec.	Publications on the guidelines and others used during the training	Information	5,000

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

Training sessions on optimizing energy and safety at sea for small fishing vessels were conducted in collaboration with Department of Balai Besar Pengembangan Penangkapan Ikan (BBPPI) of Indonesia from 28 to 30 January 2014 in Semarang, Indonesia, and with Department of Agriculture (BFAR) and BFAR regional office in Cebu from 24 to 28 March 2014 in Cebu City, Philippines. During the training, basic and applicable knowledge on energy saving and safety at sea were transferred to participants of the

<sup>1</sup> The financial, human, material, technological and information resources used for development interventions

training who include extension officers and fisheries managers of coastal provinces of the countries, ship owners, ship building authorities, fisheries officials responsible for this subject. The Guidelines (translated into national languages and printed by SEAFDEC) on optimizing energy and safety at sea for small fishing vessels were disseminated during the onsite training sessions in Indonesia and Philippines.

### 5.1 Activities Conducted in the Current Project

Table 5 List of activity conducted including involved stakeholders and budget spent

Activity	Type of activity*	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1</b>					
1. Training on Optimizing Energy and Safety at Sea for Small Fishing Vessels in Semarang, Indonesia, 28 to 30 January 2014.	II. Training	30	5	2	30,000
2. Training on Optimizing Energy and Safety at Sea for Small Fishing Vessels, Cebu, Philippine, 24 to 28 March 2014.	II. Training	30	5	2	30,000
<b>Activity 2</b>					
Information dissemination	III. Information	100			5,000

### 5.2 Output(s)

Table 6 Logframe of the Output-Monitoring

Output	Key Performance Indicators	Achievement based on indicator in Year 2014	Remarks
Output 1: Basic and applicable knowledge on energy saving and safety at sea are transferred and learned by participants through the regional training on optimizing energy and safety at sea for fishing vessels	(A) 30 participants attended the training for a total of 60 participants from 2 countries, <i>i.e.</i> Indonesia and Philippines.	Training on Optimizing Energy and Safety at Sea for Small Fishing Vessels, 28 to 30 January 2014, Semarang, Indonesia.	
	(B) 2 resource persons from Fisheries Research Agencies transferred knowledge and experiences based on current situation on optimizing energy for fishing vessels.	Training on Optimizing Energy and Safety at Sea for Small Fishing Vessels, 24 to 28 March 2014, Cebu, Philippines	
	(C) 5 resource persons from Training Department transferred knowledge on optimizing energy and safety at sea for fishing vessels.		
Output 2: Key stakeholders are aware of relevant international guidelines on optimizing energy and safety at sea (after these have been translated into national languages and disseminated to relevant countries)	(A) 100 sets of training materials were disseminated to target participants of the training comprising 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	Dissemination of guidelines on safety at sea for small fishing vessels (FAO)  Dissemination of guidelines on optimizing energy for fishing vessels (FRA)	

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	attached e-file
1. FAO guidelines on safety at sea for fishing vessels (translated into Indonesian and Pilipino languages)	Hard copies	
2. FRA guidelines on optimizing energy and safety at sea for fishing vessels	Hard copies	

### 5.3 Project Outcomes and Lessons Learned

With support provided to strengthen the efforts of ASEAN Member States and intensive advocacy on promoting energy efficiency, carbon emission to the environment would be minimized by ensuring that the contribution of fisheries sector to greenhouse gas emission is lessened. The working conditions of fishers' onboard fishing vessels which are considered poor would be greatly improved after the adoption of measures on safety of fishing vessels taking into account regional/national specificity.

### 5.4 Major Impacts/Issues

Based on results of follow-up activities with countries where the training had been conducted, the effectiveness of the project/activity implementation is assessed. The program of SEAFDEC related to "optimizing energy" should contribute to the "reduction of carbon emission" through optimizing energy for the fishing vessels, particularly for the small fishing vessels which occupy majority of the vessels operating in the region.

## PART IV: EVALUATION

### 6. Project Evaluation

Evaluation of the project activities was carried out through questionnaires circulated to the participants of the training sessions at the end of the training. The results showed that most of the participants were satisfied the contents, duration of the training in each session, experiences and capacity of the resource persons from FRA, SEAFDEC, and local officers, arrangement of the training, etc.

Table 8 Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	Results from the questionnaire and discussion with the participants of the training sessions were satisfactory. Knowledge from the lecture and discussion, and visit of the shipyard gave them a good ideas on how to apply the knowledge in their work	100
<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>	Excellent. The training sessions were conducted with excellent collaboration of the national focal point of the training as well as the active contribution of the resource persons and participants.	100
<i>Which has benefited on society and sector?</i>	A lot of benefit to fisheries extension officers, ship builders, skippers, fishery managers who are engaged with improvement of vessels for enhanced safety at sea, and knowledge on how to optimize energy using modern technology and local knowledge.	100
<i>Have products and benefits been maintained?</i>	To ensure the continuation of the services (in terms of knowledge transfer for further application at the various level of users), SEAFDEC should conduct a follow-up activity to monitor the national program related to the issues.	

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 02201001
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Resource Enhancement of Internationally Threatened and Over-exploited Species in Southeast Asia through Stock Release.		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	5 years (2010-2014)
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines
<b>Project Sponsor:</b>	JTF	<b>Project Partner:</b>	None
<b>Proposed Budget:</b>	USD 216,865	<b>This year budget:</b>	2014 USD 36,700
<b>Prepared by</b>	Takuro Shibuno, AQD DC	<b>Project Leader</b>	Takuro Shibuno, AQD DC

## 1. INTRODUCTION/BACKGROUND

The Aquaculture Department of SEAFDEC has been responsible for this project, including the management and coordination of all project activities. Other ASEAN member countries which were identified as core countries in the project are involved in implementing the relevant activities on a cost-sharing basis.

The present project tries to restore stock levels of some species listed in CITES (seahorses *Hippocampus* spp. and Napoleon wrasse *Cheilinus undulatus*) and those heavily-exploited but economically-important species in Southeast Asia (sea cucumber *Holothuria scabra*, donkey's ear abalone *Haliotis asinina*, and mud crabs *Scylla* spp.) through stock enhancement program and to enhance community-based management of the stocks and socioeconomic strategies. Adaptive measures supporting replenishment of tropical aquatic resources under the changing environment such as climate change will be also covered in the present project.

SEAFDEC/AQD will achieve an environment-friendly and sustainable stock enhancement program through the establishment of seed production technologies that take into account the preservation of the genetic diversity and release procedures so that unintended negative impacts of stock release on the wild populations and the other species should be minimized. In this project, therefore, information about the population of the species concerned, their habitats and fisheries conditions is gathered prior and subsequent to any attempts of stock release.

An effective stock enhancement program can be accomplished by establishing release strategies such as tagging methods, optimum size-at-release, site selection, conditioning animals prior to release, and securing shelters. These strategies can improve survival of the released animals in the wild.

A holistic stock enhancement program can be complemented through socio-economic studies that will identify appropriate community-based strategies for successful implementation of stock enhancement program. The proposed project will also include on-site seminars/lectures for various stakeholders to enhance local awareness about and cooperation in stock enhancement activities.

The efficacy of resource enhancement largely depends on environmental capacity. Nowadays however, natural habitats for tropical aquatic life rapidly deteriorate due to a changing environment, through anthropological repercussion including climate change. To maximize the effectiveness of resource enhancement, this project will seek adaptive measures to maintain a healthy environment.

The expected outputs of the project will include the establishment of strategies and guidelines of stock enhancement through sustainable, responsible and environment-friendly approach. The significant achievements of the project will be disseminated to ASEAN member countries to promote environment-friendly resource enhancement in the Southeast Asian region.

All the activities/sub-activities involved in this project are in line with the Resolution and Plan of Action, which were endorsed in ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 held at Bangkok in June 2011.

## **2. PROJECT**

### **2.1 Goal/Overall Objectives and Performance Indicators**

This Project aims to:

- 1) Establish mass production technology and broodstock management, and to develop methodology of stock enhancement practice of internationally threatened species (species listed in CITES);
- 2) Establish release strategies of regionally over-exploited species and verify the effectiveness of community managed sea ranching and socioeconomic strategies;
- 3) Establish adaptive measures supporting resource enhancement for a changing environment; and
- 4) Disseminate and demonstrate resource enhancement practices.

The performance indicators are as follows.

- 1) Gathering information about the population of the species concerned, their habitats and fisheries conditions;
- 2) Establishment of seed production technologies that take into account the preservation of the genetic diversity and release procedures;
- 3) Development of release strategies such as tagging methods, optimum size-at-release, site selection, conditioning animals prior to release, and securing shelters;
- 4) Establishment of appropriate community-based strategies for successful implementation of stock enhancement program;
- 5) Implementation of on-site seminars/lectures for various stakeholders to enhance local awareness about and cooperation in stock enhancement activities;
- 6) Securing environmental capacity and healthiness to maximize the effectiveness of resource enhancement; and
- 7) Establishment of strategies and guidelines of stock enhancement through sustainable, responsible and environment-friendly approach.

### **2.2 Expected Outcomes and Outputs**

Outcomes obtained from all research activities are definitely useful to LGU officers, fisher folks, researchers and academicians. However, effort to bridge gaps toward the practical levels should be continued. Since this project is a very timely program for the region, the outcome will generate positive impact in the development of sustainable fisheries in the ASEAN region.

Good progress was shown in the activities on “Stock enhancement of regionally over exploited species” and on “Establishment of adaptive measures for a changing environment”, while “Stock enhancement of internationally threatened species” faced some difficulties beyond our control and had no choice but to be behind the initial schedule, especially the research on Napoleon wrasse. The former activity has a lot of findings and outcomes which could be utilized to the respective beneficiary described above already

### **2.3 Project Description/Framework**

**Activity 1:** Stock enhancement of internationally threatened species (species listed in CITES)

**Sub-activity 1.1** Stock enhancement of seahorses, *Hippocampus comes* and *H. barbouri*

Although the survival was proven to be increased through UV-treatment of the rearing water and sterilization of the food organism, it is still highly variable. More research is needed to optimize culture efficiency and to refine mass production technology for seahorse juveniles. The present study also tries to develop release strategies and establish guidelines for stock enhancement practice.

**Sub-activity 1.2** Stock enhancement of *Napoleon wrasse*, *Cheilinus undulates*

Seed production of Napoleon wrasse has not been successful. In order to prevent further declines in natural populations, the present study will develop breeding and seed production techniques for culture as well as for restocking its natural population. The information about the population of the species concerned, their habitats and fisheries conditions is gathered prior and subsequent to any attempts of stock release.

**Activity 2:** Stock enhancement of regionally over-exploited species

**Sub-activity 2.1** Community managed sandfish *Holothuria scabra* sea ranching and stock release

Sea cucumbers are high-value marine products but its fishery is over-exploited on a global-scale. They are detritivorous feeders and could help clean and improve sediment quality. Thus, sea ranching and stock release of sandfish is expected to complement the promotion of environment-friendly resource enhancement. The present study will package, pilot and verify the effectiveness of community-managed sea-ranching and stock enhancement initiatives for managing a depleted sea cucumber fishery.

**Sub-activity 2.2** Stock enhancement of donkey's ear abalone, *Haliotis asinina*

Although SEAFDEC/AQD had successfully developed hatchery techniques for producing the present species, the technology to rebuild collapsed populations is yet to be developed. The present study will establish release strategies through development of tagging methodology, clarification of genetic structure of wild stock, and assessment of the impacts of released abalone on the wild population.

**Sub-activity 2.3** Stock enhancement of mud crab, *Scylla* spp.

The declining mud crab landing from capture fisheries is being supplemented by increasing production from aquaculture. However, mud crab aquaculture is usually in ponds constructed in former mangrove areas which are natural habitat of wild mud crab. To resolve the contradicting situation, stock enhancement is needed to address the problem of declining population.

**Sub-activity 2.4** Socio-economic analysis and identification of strategies for managing released stocks of abalone and sea cucumber in the Philippines

High-value fishery species such as abalone and sea cucumber are sourced from rural fishing areas where low-income fishers are driven towards unsustainable harvest practices. This study aims to assess some socioeconomic strategies acceptable to stakeholders and suitable for the resources being enhanced and identify policies at the local and national level that would support stock enhancement activities.

**Activity 3:** Establishment of adaptive measures supporting resource enhancement for a changing environment

**Sub-activity 3.1** Adaptive measures for coral replenishment

Coral reefs, the richest ecosystems on earth in terms of biodiversity, productivity, biomass and/or structural complexity, are in serious decline worldwide through the climate changes, and illegal fishing using dynamite and cyanide. The effects of climate change to the ocean environment are not only due to seawater warming, but also ocean acidification. The purpose of the present study is to clarify the coupled effects of acidification and warming on the growth, functions of the metabolism and photosynthesis, and the zooxanthella density in reef building coral species through a tank based examination.

**Activity 4:** Training course

Basic technologies and information on stock enhancement will be transferred to the Member Countries.



### Activity 5: Publication

Manuals, posters, pamphlets and flyer describing sustainable strategies for stock enhancement will be published and distributed.

### Activity 6: Annual progress meeting and international workshop

#### Sub-activity 6.1 Annual progress meeting

Annual meeting will be held to review the project achievement. Evaluators will be invited to join the meeting to review/evaluate the project achievements.

#### Sub-activity 6.2 International workshop

The workshop will 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 resource enhancement between SEAFDEC and various institutions.

### Activity 7: Coordination by the project leader

The project leader will coordinate and encourage the research activities and also facilitate information exchange not only domestically but also among member countries so that the present project under TF-5 will promote food safety of aquaculture products in Southeast Asia.

## 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2014

### 3.1 Activities Achievements in the Year 2014

Achievements based on Activities	Duration	Remarks
1. Stock enhancement of internationally threatened species (species listed in CITES)		
1.1. Stock enhancement of seahorses, <i>Hippocampus comes</i> and <i>H. barbouri</i>	Jan-Aug	
- Refined tagging methods on seahorses	Jan-Aug	
- Collected seahorse tissue samples and analyzed the genotype (a collaborative study with Hokkaido Univ.).		
1.2 Stock enhancement of Napoleon wrasse, <i>Cheilinus undulates</i>	Jun-Aug	
- Conducted stock assessment in the area where stock enhancement will be done	Jun-Aug	
- Conducted survey on consciousness of local peoples on stock enhancement and environmental conservation.	Jun-Aug	
2. Stock enhancement of regionally over-exploited species		
2.3 Stock enhancement of mud crab, <i>Scylla</i> spp.		
- Through monitoring survey after release, all crabs (wild and released) were sampled, and population density and growth between release and recapture were analyzed.	Jan-Sept	
- Tissue of both wild and released crabs were sent to Tohoku University for genetic analysis c/o Dr. Eguia (SEAFDEC/AQD counterpart) and Dr. Ikeda (Tohoku University counterpart).	Jan-Sept	
2.4 Socioeconomic analysis and identification of strategies for managing released stocks of abalone and sea cucumber in the Philippines		
- Conducted post-project survey to assess overall impacts of stock enhancement among stakeholders in Sagay.	Jan-Aug	
- Conducted cost-benefit analysis of stock enhancement by analyzing the project cost profile and the value of benefits identified by stakeholders.	Jan-Apr	
- Established exit strategies with BFARMC, LGU and the local traders to ensure practice of sustainable fisheries management through stock enhancement and regulated harvesting protocols.	Jan-Aug	

Achievements based on Activities	Duration	Remarks
3. Establishment of adaptive measures supporting resource enhancement for a changing environment 3.1 Adaptive measures for coral replenishment - Survival and health of coral exposed to different temperature and pH in the tank-based exam. were compared. - Genus/ species compositions in monitoring sites of coral reef are analyzed. - Temperature profiles are analyzed. - Species-specific susceptibility/adaptability of coral to adverse environments will be analyzed through genotyping of zooxanthellae.	Jan-Mar  Jan-Aug Jan-Mar Jan-Sep	
6. Annual progress meeting and international workshop 6.2 International workshop - New information on resource enhancement of internationally threatened and over-exploited species was presented and discussed by participants from ASEAN Member States, resource persons as well as study leaders in this project. Emerging problems that require urgent solutions were also discussed to pave the way for promotion of environment-friendly resource enhancement in the Southeast Asian region.	Mar	

### 3.2 Evaluation of the Project Outcomes Till the Year 2014

#### 3.2.1 Theme/Program Thrust and Issues:

**(1) Theme/Program Thrust:**

Resource enhancement of internationally threatened and over-exploited species in Southeast Asia through stock release

**(2) Issues in the region at the beginning of the study:**

The problem of diminishing populations of the CITES-listed, threatened and endangered species as well as the high value, commercially important but over-exploited species needs immediate attention in the Southeast Asian region. To address the issue on environment protection and resource conservation, SEAFDEC has implemented the project on “Stock Enhancement of Threatened Species of International Concern” under the financial support of the Government of Japan Trust Fund IV (TF-4). Under this project, SEAFDEC Aquaculture Department (AQD) has been conducting studies on basic methodologies of seed production and/or release strategies. However, basic technologies and information on stock enhancement are still lacking and further efforts are needed to enhance the said aquatic resources in the region.

#### 3.2.2 Expected Final Goal of the Project:

- To establish mass production technology and broodstock management, and to develop methodology of stock enhancement practice of internationally threatened species (species listed in CITES)
- To establish release strategies of regionally over-exploited species, and to verify the effectiveness of community managed sea ranching and socioeconomic strategies
- To establish adaptive measures supporting resource enhancement for a changing environment
- To disseminate and demonstrate resource enhancement practices

#### 3.2.3 “Steps” Toward Achieving Final Goal:

**Step 1:**

- Refinement of seed production and reproduction technologies of CITES-listed species
- Gathering baseline information of regionally over-exploited species and fisheries community
- Gathering baseline information of environmental factors in selected study sites
- Implementation of training course

**Step 2:**

- Development of release technology and establishment of spawning induction technology
- Habitat and population profiling, releasing experiments, and seminars and on-site training
- Analyses of relationships between environmental factors and biological characteristics
- Dissemination of resource enhancement practices

<p><b>Step 3:</b></p> <ul style="list-style-type: none"> <li>- Biological and cost assessment for release program, and community-based farming and restocking</li> <li>- Continuing juvenile production, monitoring for stock releases, assessment of impact of releases, and identification of socio-economic management strategies</li> <li>- Development of adaptive measures supporting resource enhancement for a changing environment</li> <li>- Workshop/seminar</li> </ul>
--

### 3.2.4 Activities in the Current Project:

<b>(1) Current position of the project: Step 3</b>
<b>(2) Total project duration: 2010-2014</b>
<p><b>(3) Main activities</b></p> <ul style="list-style-type: none"> <li>- Stock enhancement of internationally threatened species (species listed in CITES) <ul style="list-style-type: none"> <li>• Stock enhancement of seahorses, <i>Hippocampus comes</i> and <i>H. barbouri</i></li> <li>• Stock enhancement of Napoleon wrasse, <i>Cheilinus undulatus</i></li> </ul> </li> <li>- Stock enhancement of regionally over-exploited species <ul style="list-style-type: none"> <li>• Community managed sandfish <i>Holothuria scabra</i> sea ranching and stock release</li> <li>• Stock enhancement of donkey's ear abalone, <i>Haliotis asinina</i></li> <li>• Stock enhancement of mud crab, <i>Scylla</i> spp.</li> <li>• Socioeconomic analysis and identification of strategies for managing released stocks of abalone and sea cucumber in the Philippines</li> </ul> </li> <li>- Establishment of adaptive measures for a changing environment <ul style="list-style-type: none"> <li>• Adaptive measures for coral replenishment</li> </ul> </li> <li>- Technology and information transfer on resource enhancement practice through training, publication, and international workshop</li> </ul>

### 3.2.5 Progress and Achievements of the Current Project:

<p><b>(1) Activities conducted in the current project</b></p> <ul style="list-style-type: none"> <li>- To establish resource enhancement strategies of CITES species and regionally over-exploited species</li> <li>- To establish stable seed production technologies appropriate for release, with genetic consideration</li> <li>- To develop stock enhancement strategies including site assessment, stock release, and monitoring, taking into consideration impact of release on wild population and other species</li> <li>- To develop a sustainable utilization and exploitation of natural coastal resources through stock enhancement</li> <li>- To establish management strategies suitable for adoption in fishing communities through lectures/ practices on stock enhancement in Southeast Asia</li> <li>- To monitor changing environments and to establish adaptive measures supporting resource enhancement</li> <li>- To transfer basic technologies and information on stock enhancement to Member Countries</li> </ul>
<p><b>(2) Main achievements till the end of 2014 (tentative)</b></p> <ul style="list-style-type: none"> <li>- Research activity on <i>Stock enhancement of internationally threatened species</i> involves seahorses and Napoleon wrasse. The viability of Visible Implant Elastomer (VIE) tag was tested on a few representative small sized seahorse (5-6 cm) to refine tagging methods on seahorse, and the lateral body segments were marked as these areas appeared to provide the largest, most suitable injection sites.</li> <li>- With regard to research for the <i>Socioeconomic analysis and identification of strategies for managing released stocks</i>, cost-benefit analysis of stock enhancement was conducted by analyzing the project cost profile and the value of benefits identified by stakeholders..</li> <li>- With regard to research for the <i>Establishment of adaptive measures for a changing environment</i>, the function of photosynthesis of reef building coral was proved to be largely damaged by the synergistic effect of acidification and warming through analyses of the photosynthesis and metabolism ratio, since no significant decreases were detected by a single physical driver either acidification or warming of which the outcome was obtained last year.</li> <li>- “<i>International workshop on resource enhancement and sustainable aquaculture</i>”, held 5-7 March in Iloilo City, and new information on resource enhancement of internationally threatened and over-exploited species were presented and discussed. IWRESA was attended by 172 academicians &amp; researchers, government extensionists, the private sector, and representatives from SEAFDEC member-countries and featured 42 oral presentations and 15 poster papers.</li> </ul>
<p><b>(3) Outcomes/Outputs during the project period and expected achievement rate till the end of 2014 (tentative)</b></p>

Expected outcomes/outputs	Achievement rate (%)
- To establish mass production technology and broodstock management, and to develop methodology of stock enhancement practice of internationally threatened species (species listed in CITES)	90%
- To establish release strategies of regionally over-exploited species and to verify the effectiveness of community managed sea ranching and socioeconomic strategies	100%
- To establish adaptive measures supporting resource enhancement for a changing environment	100%
- To disseminate and demonstrate resource enhancement practices	100%

### 3.2.6 Evaluation of Project Activities in 2014:

#### I. Stock enhancement of internationally threatened species (species listed in CITES)

Stock enhancement of seahorses *Hippocampus* spp.

- The viability of Visible Implant Elastomer (VIE) tag was tested on a few representative small sizes. Mark locations in the lateral body segment of seahorses were modified from methods of Woods and Martin-Smith 2004. The lateral body segments were marked as these areas appear to provide the largest, most suitable injection sites. Injection sites that are separated with segments were chosen. Marking sites were along the ridges of the body segments, particularly if these areas are less pigmented than concave body segments. A single mark was injected approximately 2 mm in length beneath the skin between the first anterior tail rings on the lateral side of the seahorse.

Stock enhancement of Napoleon wrasse *Cheilinus undulatus*

- Based on the initial survey, the population of Napoleon wrasse is still thriving in Bohol but very few and depleting. Most of the people interviewed are unaware that Napoleon wrasse is included in CITES with vulnerable status, and selling and catching the fish is prohibited.
- Survey questionnaires were sent out to collaborating institution to further assess the local stock and check the awareness of the local community on stock enhancement and environmental conservation.

#### II. Stock enhancement of regionally over-exploited species

Stock enhancement of mud crab, *Scylla* spp.

- Mud crabs released in the mangroves increased yield and CPUE of fishers.
- Growth rate was slightly lower than the hatchery-reared conditioned *S. olivacea* ( $1.17 \pm 0.09 \text{ cm mo}^{-1}$ ) but higher than those of wild *S. olivacea* ( $0.76 \pm 0.03 \text{ cm mo}^{-1}$ ) released in the mangroves in Ibayay, Aklan (Lebata *et al.* 2009). These growth rates are within the range for the growth rates of *S. olivacea* (Lebata 2006).

Socioeconomic analysis and identification of strategies for managing released stocks

- A holistic stock enhancement program was carried out through socio-economic studies that identified appropriate community-based strategies for successful implementation of stock enhancement program by collaboration of fishing community, LGU and SEAFDEC/AQD in the demo-sites, Molocaboc, Sagay City.
- Cost-benefit analysis of stock enhancement is being conducted by analyzing the project cost profile and the value of benefits identified by stakeholders.
- Exit strategies with BFARMC, LGU and the local traders such as regulated harvesting based on ordinance were established to ensure practice of sustainable fisheries management through stock enhancement and regulated harvesting protocols.

#### III. Establishment of adaptive measures supporting resource enhancement for a changing environment

Adaptive measures for coral replenishment

- The function of photosynthesis was proved to be largely damaged by the synergistic effect of acidification and warming through analyses of the photosynthesis and metabolism ratio, since no significant decreases were detected by a single physical driver either acidification or warming of which the outcome was obtained last year.

#### **IV. Annual progress meeting and international workshop**

##### International workshop

- The International workshop on resource enhancement and sustainable aquaculture (IWRESA) was held last 5-7 March in Iloilo City. Organized by AQD with funding from the GOJ-Trust Fund, IWRESA was attended by 172 academicians & researchers, government extensionists, private sector, and representatives from SEAFDEC member-countries and featured 42 oral presentations and 15 poster papers.

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 02201002
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of Sustainable and Region-oriented Aquaculture Practices.		
<b>Program Thrust:</b>	I	<b>Total Duration:</b>	5 years (2010-2014)
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines
<b>Project Sponsor:</b>	JTF	<b>Project Partner:</b>	None
<b>Proposed Budget:</b>	USD 440,976	<b>This year budget:</b>	2014 USD 70,100
<b>Prepared by</b>	Takuro Shibuno, AQD DC	<b>Project Leader</b>	Takuro Shibuno, AQD DC

## 1. INTRODUCTION/BACKGROUND

The Aquaculture Department of SEAFDEC has been managing and coordinating all project activities. Other ASEAN member countries which were identified as core countries in the project have also been involved in implementing the relevant activities.

The present project involved five major activities. The first activity has aimed at genetic selection in mud crab *Scylla serrata*, black tiger shrimp *Penaeus monodon*, and giant freshwater prawn *Macrobrachium rosenbergii* based on criteria set for producing subsequent generations that exhibit faster growth, better reproductive performance and higher disease resistance, in which genetic monitoring to maintain high genetic variability and identification of possible genetic markers for the selected beneficial traits is applied. Genetic improvement of red macro algae *Kappaphycus* spp. were also targeted to promote the sustainable aquaculture, particularly, to address the continuous decline in the quality of cultivars, disease and harmful endophytes and the declining quality of carrageenan. The development of hatchery technology of emerging species with a pressing need to develop breeding, seed production and culture techniques was also included in this activity.

Efficient and low pollution feeds for various stages of commercially important aquaculture species such as freshwater prawn, milkfish, grouper, mud crab, and black tiger shrimp using feed ingredients available in the region as replacement for imported fish meal was planned to focus in the second activity. Guidelines on proper feeding management to obtain optimal feed performance and to reduce the negative impacts of improper feeding on the environment aimed to be established.

Based on the analysis of risk factors and other epidemiological data gathered so far, a management scheme to prevent or control shrimp diseases was planned to be designed in the third activity. Efficiency of the designed scheme was tested by means of simulated tank and pond experiments which were verified by farm trials.

The project analyzed the socio-economic impact of the transfer and adoption of aquaculture technologies in selected sites as the fourth activity. The institutional and socioeconomic factors that help or hinder the adoption of the technology were identified.

In addition to the abovementioned activities, knowledge and technologies for promotion of sustainable and region-oriented aquaculture practice were disseminated through training courses, demonstration farm, publication of manuals/textbooks, and lecture/seminar with especially prioritizing the less developed ASEAN Member States.

All the activities/sub-activities involved in this project are in line with the Resolution and Plan of Action, which were endorsed in ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 held at Bangkok in June 2011.

## 2. PROJECT

### 2.1 Goal/Overall Objectives and Performance Indicators

This Project will:

- 1) Establish reliable mass production techniques for genetically improved strains of commercially important species and to establish seed production techniques for newly emerging species for aquaculture;
- 2) Develop environment-friendly, cost-effective practical feeds using ingredients available in the Southeast Asian region and establish guidelines on feeding management for sustainable aquaculture;
- 3) Develop farm management strategies that eliminate the risk factors through epidemiological and environmental approaches to prevent and control diseases;
- 4) Identify clear policies for implementing sustainable aquaculture and to recommend policies for enhancing the adoption of suitable aquaculture technologies for the lesser developed countries in the region; and
- 5) Verify and disseminate the project achievements especially in the lesser developed countries in the region through demonstration, training, lecture/seminar and publication activities.

The performance indicators are as follows:

- 1) Genetic selection in mud crab *Scylla serrata*, black tiger shrimp *Penaeus monodon*, and giant freshwater prawn *Macrobrachium rosenbergii* based on criteria set for producing subsequent generations that exhibit faster growth, better reproductive performance and higher disease resistance, in which genetic monitoring to maintain high genetic variability and identification of possible genetic markers for the selected beneficial traits is applied;
- 2) Development of hatchery technology of potential species, including breeding, seed production and grow out techniques;
- 3) Surveys of the availability and quality assessment of feed resources in the Philippines and selected developing countries in Southeast Asia
- 4) Establishment of feeding management using plant-origin diet to obtain optimal feed performance and to reduce the negative impacts of improper feeding on the environment;
- 5) Establishment of management scheme to prevent or control shrimp diseases based on analysis of risk factors and epidemiological data;
- 6) Analyses of the socio-economic impact of the transfer and adoption of aquaculture technologies; and
- 7) Dissemination of knowledge and technologies for promotion of sustainable and region-oriented aquaculture practice through training courses and International workshop.

### 2.2 Expected Outcomes and Outputs

Methods and information gathered from all research activities are definitely useful to aquaculturists, researchers and academicians. However, there are still gaps to the practical levels. Seed production technologies based on the genetic improvement, especially, some criteria/ fundamental methodologies for appropriate selection/ broodstock management scheme of local stock having preferable performance such as growth, reproduction and disease resistance, were developed for commercially important species such as mud crab and giant freshwater prawn. However, in the case of black tiger shrimp, domestication itself has not yet established well before proceeding to the selective breeding. Culture conditions for *Kappaphycus sp.* were optimized only in the laboratory. It is regretful that the activity was stopped without optimizing culture conditions of in the farming areas and in the natural waters. The terminal report on the *Kappaphycus* production should be yet submitted. The study on the seed production technology for emerging species has obtained some outcomes, but they are still limited under the laboratory condition. The artificial administration of hormones could be applicable for validation of the expected efficacy of the manipulation of environmental conditions under the laboratory condition. However, it is not always allowed for the practical use unless the safety and no side effects not only on the target species but also on the environment are proven as well as the cost benefit. The study on the efficient and low pollution feeds replaced to the fishmeal for giant fresh water prawn brought very valuable outcomes, and yet expected to be applied to other important aquaculture species and be verified to the commercial scale. On the other hand, the research activity on establishment of guidelines for feeding management was regrettably stopped without producing valuable results. Contrarily, the activities on “aquaculture environmental management technology” and “socio-economic assessment and impact analysis of transfer and adoption of sustainable

aquaculture technologies” had remarkable outcomes already, which are considered to be in a practical stage. Technology extension and demonstration activities generally received the positive evaluation from participants of the respective training courses, and yet the efficacy should be discussed for the future program buildings because of very limited participants under the budgetary constraint.

### **2.3 Project Description/Framework**

**Activity 1:** Genetic improvement of commercially important species and development of hatchery technology

#### ***Sub-activity 1.1*** Selective breeding of mud crab *Scylla serrate*

It has been observed that growth of the wild seedstock was faster compared with the hatchery-reared seedstock when grown in brackish water ponds. The selection of *Scylla serrata* will be tried based on set criteria aimed at producing subsequent generations that exhibit faster growth and better reproductive performance. In addition, genetic monitoring will be employed to maintain high genetic variability and identify possible genetic markers for the selected beneficial traits.

#### ***Sub-activity 1.2*** Selective breeding of black tiger shrimp *Penaeus monodon*

A breeding program that considers selection for beneficial heritable traits such as improved growth, disease resistance and breeding performance needs to be implemented to improve seed and broodstock quality and lessen the pressure on wild stocks. Through the selective breeding of black tiger shrimp, the heritability of survival, growth and disease resistance will be determined in the local population.

#### ***Sub-activity 1.3*** Genetic improvement of giant freshwater prawn *Macrobrachium rosenbergii*

Low seed yield, slow growth, poor production output and other problems associated with inefficient broodstock management are commonly encountered in prawn hatcheries. This study will try to improve economically important traits such as breeding performance and growth in domesticated giant freshwater prawns. Information on effective broodstock management schemes that can be adopted on farm will be generated.

#### ***Sub-activity 1.4*** Mass production of plantlets with improved traits

SEADEC/AQD has developed a techniques enabling development of plantlets through tissue culture. However, there is a need to pursue further on the different strains available in the farming areas and in the natural waters. Through this activity tissue culture techniques will be developed so that mass production of the “new and improved” plants will be obtained for commercial farming.

#### ***Sub-activity 1.5*** Development of hatchery technology of emerging species

To preserve the sustainability of coastal wild resources, extreme utilization of the limited major species, of which the broodstock and fry are captured for aquaculture, should be restricted. The present study will develop hatchery technology of newly merging species not only to reduce the negative impact on the wild fish resources but also to benefit the fish farmers as well as the consumers.

**Activity 2:** Development of environment-friendly feeds using regionally available ingredients

***Sub-activity 2.1*** Development of efficient and low-pollution diets for grow-out and broodstock (freshwater prawn, milkfish, grouper, mud crab, and black tiger shrimp)

The present study will develop cost-efficient and low pollution awafeeds for the grow-out (100 g to 500 g body weight) and broodstock stages of grouper, milkfish, mud crab, shrimp and freshwater prawn, and determine the qualitative and quantitative requirements of grouper, milkfish, and mud crab for important micronutrients.



**Sub-activity 2.2** Establishment of guidelines for optimum feeding management through survey of availability and quality assessment of feed resources

The project will survey the availability and assess the quality of feed resources in the Philippines and in selected developing countries in Southeast Asia through concentrating on feed resources that are actually used or have potential use in feed production, on their nutritional quality, and on those toxins to which fish can be potentially exposed to. Based on the results of the said study as well as **Sub-activity 2.1**, guidelines can be established for optimum feeding management to reduce the impacts of feeding and promote sustainable aquaculture in the region.

**Activity 3:** Establishment of managing technology of aquaculture environment

The best shrimp farming strategy has yet to be determined. The present study will develop pond management strategies to prevent and control viral and other disease of shrimp by eliminating the risk factors, and promote the implementation of disease of shrimp farming by using environmental based management strategies.

**Activity 4:** Socio-economic assessment and impact analysis of transfer and adoption of sustainable aquaculture technologies

Acceptability of the technology in the locally becomes an essential component of integrated rural development. Development of effective institutions is needed to respond to aquaculture rapid expansion with its new products and changing farming methods to foster responsible aquaculture in the region. The present study will elucidate difficulties, benefits and institutional constraints in technology adoption and establish policy brief for enhancing technology adoption.

**Activity 5:** Technology extension and demonstration

**Sub-activity 5.1** Giant freshwater prawn production training program

There are several commercially valuable freshwater prawn species particularly under the Genus *Macrobrachium*, giant freshwater prawn. This activity will extend and demonstrate the production technique of *Macrobrachium* spp. to the trainees.

**Sub-activity 5.2** Regional dissemination of mud crab farming program

This activity will disseminate the farming program of mud crab, the Genus *Scylla*, of which widespread interest is increasing because of the high price both in domestic and international market.

**Sub-activity 5.3** Regional dissemination of black tiger shrimp farming program

The black tiger shrimp *Penaeus monodon* is one of the predominant aquaculture species in Southeast Asia. This training program will extend and disseminate the selective breeding technology in this species.

**Sub-activity 5.4** 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 *etc.*

**Sub-activity 5.5** Abalone hatchery training program

The donkey's ear abalone *Haliotis asinina* has been the focus of research and development efforts at SEAFDEC/AQD since 1994 due to its large size. This activity will offer the fundamental and essential hatchery technology of tropical abalone.

**Sub-activity 5.6** Seaweed farming training program

(Because of constraint of budget, this training course schedule in 2014 will be cancelled.)

A red algae *Kappaphycus* is cultured throughout the country, which has very useful properties as a source of carrageenan. This activity will offer the fundamental and essential information on *Kappaphycus* farming technology and management.

**Sub-activity 5.7** On-line course on nutrition and on-site feed preparation training program

A balanced diet for fish is important in ensuring fast growing, healthy, and disease-free fish and shrimps. This activity will offer the fundamental and essential information on fish nutrition, feed formulation and feed management.

**Sub-activity 5.8** 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 activity, which will promote capacity building for establishing appropriate aquaculture systems applicable in remote rural areas.

**Activity 6:** Publication

Manuals, posters, pamphlets and flyer describing the sustainable aquaculture will be published and distributed.

**Activity 7:** Annual progress meeting and international workshop

**Sub-activity 7.1** Annual progress meeting

Annual progress meeting will be held to review the project achievement. Evaluators will be invited to join the meeting to review/evaluate the project achievements.

**Sub-activity 7.2** International workshop

The workshop will 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 sustainable aquaculture between SEAFDEC and various institutions.

**Activity 8:** Coordination by the project leader

The project leader will coordinate and assist the research, training and dissemination, and also facilitate information exchange not only domestically but also among member countries so that sustainable aquaculture practices 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.

**3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2014**

**3.1 Activities Achievements in the Year 2014**

Achievements based on Activities	Duration	Remarks
<p><b>1. Genetic improvement of commercially important species and development of hatchery technology</b></p> <p>1.1 Selective breeding of mud crab <i>Scylla serrata</i></p> <p>- Experiments were continued to evaluate the response of crabs to selection on growth and disease resistance. Reciprocal mating were done and the performance of the succeeding generations was compared with the previous generations.</p>	<p>Jan-Aug</p>	

Achievements based on Activities	Duration	Remarks
<p>1.2 Selective breeding of black tiger shrimp <i>Penaeus monodon</i></p> <ul style="list-style-type: none"> <li>- For 2013, F<sub>1</sub> were grown to broodstock size and induced to mature to produce F<sub>2</sub>. In 2014, growth of F<sub>2</sub>s are being monitored.</li> </ul>	Jan-Aug	
<p>1.3 Genetic improvement of giant freshwater prawn <i>Macrobrachium rosenbergii</i></p> <ul style="list-style-type: none"> <li>- After the growth experiment, same-aged breeders were selected from the stocks and subsequently used for the breeding experiments, using the most effective broodstock management scheme.</li> </ul>	Jan-Aug	
<p>1.5 Development of hatchery technology of emerging species</p> <ul style="list-style-type: none"> <li>- Experiments were conducted to determine the optimum hormone concentration to induce spawning in the spotted scat, and to determine the optimum conditions for larval rearing by investigating the potential use of probiotic in the hatchery culture of pompano and spotted scat were done.</li> </ul>	Jan-Aug	
<p><b>2. Development of environment-friendly feeds using regionally available ingredients</b></p>		
<p>2.1 Development of efficient and low-pollution diets for grow-out and broodstock</p> <ul style="list-style-type: none"> <li>- The effects of fishmeal replacement by plant-based protein sources in feeds on broodstock diets on the reproductive performance and larval production were evaluated.</li> </ul>	Jan-Aug	
<p><b>3. Establishment of managing technology of aquaculture environment</b></p>		
<ul style="list-style-type: none"> <li>- Refinement of the designed management scheme was done using ponds at UPV-BAC or in collaboration with private shrimp farmers.</li> </ul>	Aug-Dec	
<p><b>5. Technology extension and demonstration</b></p>		
<p>5.4 Marine fish hatchery training program</p> <ul style="list-style-type: none"> <li>- The International Training Course on Marine Fish Hatchery was offered to transfer and to disseminate improved technologies for broodstock management, seed production and grow-out culture of marine fishes.</li> </ul>	May	
<p>5.5 Abalone hatchery training program</p> <ul style="list-style-type: none"> <li>- The International Training Course on Abalone Hatchery and Grow-out was conducted</li> </ul>	May	
<p>5.7 AquaHealth Online Online (AHOL) training program</p> <ul style="list-style-type: none"> <li>- AquaHealth Online (AHOL) 2014 has been held from 08 September, 2014 to 22 February, 2015</li> </ul>	Sep-Feb	
<p>5.8 Rural aquaculture program</p> <ul style="list-style-type: none"> <li>- The 10-day course aims to enhance the knowledge and skills of the participants on appropriate and suitable freshwater aquaculture methods and practices so that they would be able to transfer and promote these technologies to rural communities for livelihood and poverty alleviation.</li> </ul>	July-Dec	
<p><b>6. Publication</b></p>		
<ul style="list-style-type: none"> <li>- Manuals, posters, pamphlets and flyer describing the sustainable aquaculture will be published and distributed.</li> </ul>	Oct-Dec	
<p><b>7. Annual progress meeting and international workshop</b></p>		
<p>7.2 International workshop</p> <ul style="list-style-type: none"> <li>- New information on resource enhancement of internationally threatened and over-exploited species was presented and discussed by participants from ASEAN Member States, resource persons as well as study leaders in this project. Emerging problems that require urgent solutions will also be discussed to pave the way to promote environment-friendly resource enhancement in the Southeast Asian region.</li> </ul>	Mar	

### 3.2 Evaluation of the Project Outcomes Till the Year 2014

#### 3.2.1 Theme/Program Thrust and Issues:

**(1) Theme/Program Thrust:**

Promotion of Sustainable and Region-Oriented Aquaculture Practices

**(2) Issues in the region at the beginning of the study:**

Aquaculture is undoubtedly one of the practical ways for addressing the issues of food security and widespread poverty in the rural areas of the ASEAN region which exports a great amount of fisheries products to all over the world. However, aquaculture production in the region needs to be increased in a sustainable and environment-friendly manner as declared by the Ministers of the ASEAN-SEAFDEC Member Countries responsible for fisheries. Promotion of Sustainable and Region-Oriented Aquaculture Practices is vital not only to the promotion of sustainable aquaculture in the region but also to the stable supply of safe aquaculture products to the region.

#### 3.2.2 Expected Final Goal of the Project:

- To ensure reliable and sustainable production through genetic improvement of commercially important species and to establish reliable breeding and mass seed production techniques for new species for aquaculture
- To develop environment-friendly feeds for marine fish and crustaceans from regionally available ingredients
- To establish managing technology of aquaculture environment
- To access and analyze impact of transfer and adoption of sustainable aquaculture technologies for fisherfolk in the region
- To disseminate and demonstrate the aquaculture technology

#### 3.2.3 “Steps” Toward Achieving Final Goal:

**Step 1:**

- Production of various generations and families of commercially important species, evaluation of the impact of domestication selection on hatchery stocks, and collection of juveniles or adults for broodstock development of emerging species
- Information survey, formulation and preparation of cost-effective and low pollution feeds
- Gathering information on farm management techniques and best management practices
- Assessment of the socioeconomic impact of the technology transfer and adoption
- Implementation of training courses, demonstration farm and lecture/seminar

**Step 2:**

- Selective breeding and genetic monitoring, formulation and assessment of different broodstock management protocols, and induction of spawning, seed production and grow-out trials of emerging species
- Controlled feeding experiments and incorporate findings in test diets in the laboratory
- Analysis and design of a management scheme and verification of the management scheme
- Examination of property rights regimes impinging on technology adoption and adaptation
- Transfer of technical through capacity building to member countries

**Step 3:**

- Monitoring, assessment and refinement of heritability of selected traits, and promotion of hatchery, nursery and grow-out for emerging species
- Feeding experiments in ponds, net cages or broodstock tanks
- Refinement of scheme through farm trials and dissemination of knowledge and technology
- Recommendation of policies for enhancing the adoption of sustainable aquaculture technologies suitable for developing countries in the region
- Workshop/seminar.

### 3.2.4 Activities in the Current Project:

<b>(1) Current position of the project: Step 3</b>
<b>(2) Total project duration: 2010-2014</b>
<b>(3) Main activities</b> <ul style="list-style-type: none"> <li>- Genetic improvement of commercially important species and development of hatchery technology</li> <li>- Development of environment-friendly feeds using regionally available ingredients</li> <li>- Establishment of managing technology of aquaculture environment</li> <li>- Socioeconomic assessment and impact analysis of transfer and adoption of sustainable aquaculture technologies</li> <li>- Technology extension and demonstration</li> </ul>

### 3.2.5 Progress and Achievements of the Current Project:

<b>(2) Main activities conducted in the current project</b> <ul style="list-style-type: none"> <li>- To establish reliable mass production techniques for genetically improved strains of commercially important species and to establish seed production techniques for newly emerging species for aquaculture</li> <li>- To develop environment-friendly and cost-effective practical feeds using ingredients available in the Southeast Asian region and establish guidelines on feeding management for sustainable aquaculture</li> <li>- To develop farming management strategies that eliminate the risk factors through epidemiological and environmental approaches to prevent and control diseases</li> <li>- To identify clear policies for implementing sustainable aquaculture and to recommend policies for enhancing the adoption of suitable aquaculture technologies for the lesser developed countries in the region</li> <li>- To verify and disseminate the project achievements especially in the lesser developed countries in the region through demonstration, training, lecture/seminar and publication activities</li> </ul>	
<b>(2) Main achievements till the end of 2014 (tentative)</b> <ul style="list-style-type: none"> <li>- Concerning the study which focus on “development of hatchery technology of emerging species”, trials showed that the addition of probiotic to live food organism for larval culture of pompano promotes better assimilation of nutrients as indicated by the increase in the enzyme activities in the larvae that results in better growth, survival and tolerance to hypoxic condition.</li> <li>- With regard to research on “Development of efficient and low-pollution diets for grow-out and broodstock” under the activity on development of environment-friendly feeds using regionally available ingredients, experiments indicated that larval quantity (average number of larvae per hatching event) of <i>Macrobrachium rosenbergii</i> was markedly better at 30% cowpea meal level compared to other dietary treatments.</li> <li>- Apart from research, efforts were made to build the capacity of the Philippines and Member Countries through implementation of the following training activities under Technology extension and demonstration: 1) Abalone hatchery (from 7 to 27 May, 2014), 2) Marine fish hatchery (from 18 June - 25 July, 2014).</li> <li>- At the ‘International workshop on resource enhancement and sustainable aquaculture’, held last 5-7 March in Iloilo City, new information on sustainable and region-oriented aquaculture practices were presented and discussed. IWRESA was attended by 172 academicians &amp; researchers, government extensionists, the private sector, and representatives from SEAFDEC Member Countries and featured 42 oral presentations and 15 poster papers.</li> </ul>	
<b>(3) Outcomes/Outputs during the project period and expected achievement rate till the end of 2014 (tentative)</b>	
<b>Expected outcomes/outputs</b>	<b>Achievement rate (%)</b>
- To ensure reliable and sustainable production through genetic improvement of commercially important species and to establish reliable breeding and mass seed production techniques for new species for aquaculture	90%
- To develop environment-friendly feeds for marine fish and crustaceans from regionally available ingredients	90%
- To establish managing technology of aquaculture environment	100%
- To disseminate and demonstrate the aquaculture technology	100%

### 3.2.6 Evaluation of Project Activities in 2014:

#### **I. Genetic improvement of commercially important species and development of hatchery technology**

##### **Selective breeding of mud crab *Scylla serrata***

- The study was done to develop selective breeding techniques for the mud crab *Scylla serrata*. *S. serrata* were grown from hatchery to grow-out phase for the production of good quality domesticated stock. As a requirement to selective breeding, criteria for selection of good quality larvae for stocking in the hatchery, juveniles for grow-out culture and adult size crabs for broodstock were determined.
- *S. serrata* juveniles were subjected to challenge test using luminescent bacteria *Vibrio harveyi* to evaluate the disease resistance of each family. Juveniles from family Sam2A (F1) ( $3 \times 10^{5.6}$  cfu/crab) had the highest resistance to *V. harveyi* followed by family Sam2C ( $2 \times 10^{5.5}$  cfu/crab), family Sam2D ( $3 \times 10^{5.4}$  cfu/crab) and family CamB (F1) ( $3 \times 10^{5.5}$ ).
- Juveniles from CamA ( $2 \times 10^{4.4}$  cfu/crab) and Sam2B ( $2 \times 10^{4.5}$  cfu/crab) had high mortality even at low levels of *V. harveyi*. The same pattern was observed in terms of duration to 100% cumulative mortality.

##### **Selective breeding of black tiger shrimp *Penaeus monodon***

- The low hatching rates obtained with F1 males X F1 females compared to that obtained in wild males X F1 females confirm results of recent studies that captive males have a lesser ability to recognize cues given by newly-molted females that they are ready for mating. However, in this particular comparison, only 1 replicate was used and more replications are needed for results to be conclusive.
- The subsequent nauplii production showed that captive broodstock are capable of producing the same quantity of nauplii as wild broodstock which produced from 150,000-450,000 nauplii. The highest number of nauplii produced by the F1 in this test was 357,500. However, the percentage of spawnings and number of nauplii produced are still very inconsistent.

##### **Genetic improvement of giant freshwater prawns *Macrobrachium rosenbergii*: III. Assessment of effective broodstock management schemes for improved growth and reproductive performance**

- Compared to offsprings of purebred matings, gains from interstock crosses may not be stable beyond two generations as originally thought of. The first two years could more than likely be a result of "hybrid vigor". Apart from genetic variation, an important consideration could be the effect of adaptability to the rearing environment as indicated by the observed differences in the survival rate of the stocks, with the purebred OC having the highest survival at 33.3% followed by the Pm stock at 30.83%. As for the reproductive efficiency comparison run between OC (F<sub>3</sub>), NC (F<sub>5</sub>), OCxNC and NCxOC reciprocal (F<sub>3</sub>) hybrids and Pampanga River (PR, F<sub>1</sub>) lines, results shall be available in March 2015 after the final sampling for growth parameters.

##### **Development of hatchery technology of emerging species**

- Rearing conditions for larvae (potential use of probiotic on the hatchery culture of Pompano): Addition of probiotic to live food organism for larval culture of pompano promotes better assimilation of nutrients as indicated by the increase in the enzyme activities in the larvae that results in better growth, survival and tolerance to hypoxic condition.

#### **II. Development of environment-friendly feeds using regionally available ingredients**

##### **Development of efficient and low-pollution diets for grow-out and broodstock: I. Partial replacement of fishmeal with cowpea meal in practical diets for giant freshwater prawn *Macrobrachium rosenbergii*.**

- Although the reproductive performance of *M. rosenbergii* did not show a clear pattern in terms of percentage of berried females, fecundity slightly improved up to 20% cowpea meal and then decreased.
- Larval quantity (average number of larvae per hatching event) was markedly better at 30% cowpea meal level compared to other dietary treatments. Larval development, survival and postlarval production have yet to determine at the end of the rearing trial.

#### **III. Technology Extension & Demonstration**

##### **Abalone Hatchery and Grow-out GOJ-TF Training Courses**

- The International Training Course on Abalone Hatchery and Grow-out was conducted from 7 to 27 May, 2014 with 4 participants: Cambodia (1), Singapore (1), Vietnam (1) and Philippines (1). Three participants from Cambodia, Vietnam and Philippines had GOJ-TF grant.

**Marine Fish Hatchery and Grow-out Training Course**

- The International Training Course on Marine Fish Hatchery was conducted at Tigbauan Main Station from 18 June - 25 July, 2014 with 9 participants: Brunei (2), Cambodia (1), Thailand (1), and Singapore (2), and Philippines (3). The participant from Brunei (1), Cambodia (1), Thailand (1), and Philippines (1) were awarded with GOJ-TF Training Fellowship Grant.

**IV. Annual progress meeting and international workshop**

**International workshop**

- The international workshop on resource enhancement and sustainable aquaculture (IWRESA) was held last 5-7 March in Iloilo City. Organized by AQD with funding from the GOJ-Trust Fund, IWRESA was attended by 172 academicians & researchers, government extensionists, the private sector, and representatives from SEAFDEC member-countries and featured 42 oral presentations and 15 poster papers.

**PROJECT DOCUMENT**  
**PROPOSED ACTIVITY FOR YEAR 2015 AND**  
**ACHIEVEMENTS FOR YEAR 2014**

			Project id: 03201301
<b>Program Categories:</b>	Projects under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Chemicals and Drug Residues in Fish and Fish Products in Southeast Asia - Biotoxins (ASP, AZA and BTX) and Harmful Algal Blooms (HABs) in the ASEAN region		
<b>Program Thrust:</b>	II	<b>Total Duration:</b>	2013 - 2017
<b>Lead Department:</b>	MFRD Programmes	<b>Lead Country:</b>	Singapore
<b>Donor/Sponsor:</b>	JTF VI	<b>Total Donor Budget:</b>	USD 250,400
<b>Project Partner:</b>	ASEAN-SEAFDEC Member Countries	<b>Budget for 2015:</b>	USD 49,200
<b>Project leader:</b>	Neo Shan Yu, Scientist (PHTC/AVA); Liu Yankai, Scientist (PHTC/AVA)		

## **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 the 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 comprised 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 in the identification of biotoxin-producing Harmful Algal Blooms (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.

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

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

During the End-of-Project seminar for the biotoxins monitoring project in 2012, member countries also pointed the importance of identifying 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 that MFRD 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 Expected Outcomes

The expected outcomes of the project are:

1. Enhanced laboratory capabilities and knowledge in the testing of ASP, AZA and BTX biotoxins;
2. Establishment of monitoring programmes for ASP, AZA and BTX biotoxins in member countries for routine surveillance;
3. Improved knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in the ASEAN region;
4. Improved knowledge and understanding on toxic HAB occurrences and incidences in the ASEAN region;
5. Enhanced capabilities for the identification of biotoxin-producing HAB species in the member countries.

#### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
<b>Outcome 1:</b> Enhanced laboratory capabilities and knowledge in the testing of ASP, AZA and BTX biotoxins.	Regional training course in biotoxins (AZA, ASP and BTX) analyses.	Organization and conduct of Regional Training Course in Biotoxins (AZA, ASP and BTX) Analyses, 2-6 June 2014, Singapore.	<ul style="list-style-type: none"> <li>- At least 8 ASEAN-SEAFDEC Member Countries participated and trained.</li> <li>- Implemented within the budget allocated.</li> </ul>
<b>Outcome 2:</b> Establishment of monitoring programmes for ASP, AZA and BTX biotoxins in member countries for routine surveillance.	Biotoxin monitoring surveys in member countries.	Organization and conduct of one and half-year Biotoxins Monitoring Survey in 2015-2016.	<ul style="list-style-type: none"> <li>- Surveys carried out in at least 8 ASEAN-SEAFDEC Member Countries.</li> </ul>
<b>Outcome 3:</b> Improved knowledge and understanding on ASP, AZA and BTX biotoxins occurrences and incidences in fish and shellfish in the ASEAN region.	<ul style="list-style-type: none"> <li>- Regional Technical Consultation.</li> <li>- Biotoxin monitoring surveys in member countries.</li> <li>- End-of-Project (EOP) Seminar.</li> <li>- Technical Compilation.</li> </ul>	<ul style="list-style-type: none"> <li>Organization and conduct of Regional Technical Consultation, 24-25 July 2013, Singapore.</li> <li>Organization and conduct of one and half-year Biotoxins Monitoring Survey in 2015-2016.</li> <li>Organization and conduct of End-of-Project (EOP) Seminar in 3<sup>rd</sup> qtr 2017.</li> <li>Preparation and publication of Technical Compilation in 2017.</li> </ul>	<ul style="list-style-type: none"> <li>- Participation by at least 8 ASEAN-SEAFDEC Member Countries.</li> <li>- Implemented within the budget allocated.</li> <li>- Surveys carried out in at least 8 ASEAN-SEAFDEC Member Countries.</li> <li>- Participation by at least 8 ASEAN-SEAFDEC Member Countries.</li> <li>- Implemented within the budget allocated.</li> <li>- Technical Compilation published and distributed to Member Countries.</li> </ul>

<p><b>Outcome 4:</b> Improved knowledge and understanding on toxic HAB occurrences and incidences in the ASEAN region.</p>	<ul style="list-style-type: none"> <li>- Regional Technical Consultation.</li> <li>- Technical Compilation.</li> <li>- End-of-Project (EOP) Seminar</li> </ul>	<p>Organization and conduct of Regional Technical Consultation in 2<sup>nd</sup> qtr 2015.</p> <p>Preparation and publication of Technical Compilation in 2017.</p> <p>Organization and conduct of End-of-Project (EOP) Seminar in 3<sup>rd</sup> qtr 2017.</p>	<ul style="list-style-type: none"> <li>- Participation by at least 8 ASEAN-SEAFDEC Member Countries.</li> <li>- Implemented within the budget allocated.</li> <li>- Technical Compilation published and distributed to Member Countries.</li> <li>- Network or directory of responsible national authorities and HAB experts in the region established.</li> <li>- Participation by at least 8 ASEAN-SEAFDEC Member Countries.</li> <li>- Implemented within the budget allocated.</li> </ul>
<p><b>Outcome 5:</b> Enhanced capabilities for the identification of biotoxin-producing HAB species in member countries.</p>	<p>Regional training course in identification of biotoxin-producing HAB species.</p>	<p>Organization and conduct of Regional Training Course in Identification of Biotoxin-producing HAB species in 2<sup>nd</sup> qtr 2016.</p>	<ul style="list-style-type: none"> <li>- At least 8 ASEAN-SEAFDEC Member Countries participated and trained.</li> <li>- Implemented within the budget allocated.</li> </ul>

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
<p>Activity 1: Regional Technical Consultation on Biotoxins (ASP, AZA and BTX) Monitoring in the ASEAN region (2 days)</p>	<p>This Regional Technical Consultation which will be held in the first year of the project, in the 2<sup>nd</sup> quarter of 2013, to 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.</p>
<p>Activity 2: Regional Training Course in Biotoxins (ASP, AZA and BTX) Analyses (5 days)</p>	<p>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.</p>
<p>Activity 3: Biotoxins Monitoring Survey (One and half-year)</p>	<p>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</p>

	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 meeting (RTC) will be held in Singapore in 2 <sup>nd</sup> 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 days)	This Regional Training Course will be conducted in Singapore in 2 <sup>nd</sup> 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.
Activity7: End-of-Project (EOP) Seminar (2 days)	The End-of-Project (EOP) Seminar will be held in the 3 <sup>rd</sup> 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.

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

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity1: Regional Technical Consultation on Biotoxins (ASP, AZA and BTX) Monitoring in the ASEAN region	Sub-activity 1.1 -	35,000	-	-	-	-
Activity 2: Regional Training Course in Biotoxins (ASP, AZA and BTX) Analyses	Sub-activity 2.1: -	-	45,000	-	-	-
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	7,500	-

Activity 4: Regional Technical Consultation on Biotoxin-producing HAB species Identification	Sub-activity 4.1 -	-	-	31,700	-	-
Activity 5: Regional Training Course in Biotoxin-producing HAB species Identification	Sub-activity 5.1 -	-	-	-	45,700	-
Activity 6: Technical Compilation	Sub-activity 4.1: -	-	-	-	7,500	7,500
Activity 5: End-of-Project (EOP) Seminar	Sub-activity 5.1: -	-	-	-	-	53,000
	<b>Sub-Total</b>	<b>35,000</b>	<b>45,000</b>	<b>49,200</b>	<b>60,700</b>	<b>60,500</b>

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/sub-activity, work plan and estimated budget for the year 2015

Table 4 Detailed Activity/Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)				
Activity/Sub-Activity	Timeframe/period	Inputs <sup>1</sup>	Type of Activity	Proposed Budget
Sub-Activity 3.1 Setting up of Biotoxins Analyses Methodologies	Jan-Mar	Cost-sharing by member countries	Research and Development	10,000
Sub-Activity 3.2 Implementation of Biotoxins Monitoring Survey	Apr-Dec	Cost-sharing by member countries	Research and Development	7,500
Activity 4: Regional Technical Consultation on Biotoxin-producing HAB species Identification	Apr-Jun/ 2 days	Logistical support from PHTC/AVA	Policy development	31,700

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

In 2014, one project activity *i.e.* the Regional Training Course in Biotoxins (ASP, AZA and BTX) Analyses was successfully organized and conducted in Singapore on 2-6 June 2014. This training course was jointly conducted by the Post-Harvest Technology Center and the Veterinary Public Health Laboratory, Agri-Food & Veterinary Authority of Singapore, together with two biotoxins expert, Dr. Toshiyuki Suzuki from the National Research Institute of Fisheries Science, Fisheries Research Agency, Japan and Dr. Dao Viet Ha from the Institute of Oceanography, Vietnam. It was attended by 21 participants from the 10 ASEAN-SEAFDEC member countries. The course has trained participants on the use of chemical-based / instrument based techniques for biotoxins analyses through a series of lectures and hands-on practical sessions which the participants had found very useful and beneficial to their area of work. The participants gained knowledge and skills on the analyses of these biotoxins and will be able to set up these methods to upgrade their laboratory capabilities to conduct the biotoxins monitoring surveys in their respective countries in 2015-2016. This will help contribute to the project's objective of upgrading

<sup>1</sup> The financial, human, material, technological and information resources used for development interventions

of regional laboratory capabilities and credibility in biotoxins analyses as well as the establishment of biotoxins monitoring programmes for routine surveillance in Member Countries.

### 5.1 Activities Conducted in the Current Project

Table 5 List of activity conducted, involved stakeholders and budget spent

List of Actual Sub-activity (1)	Type of activity*	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
Regional Training Course in Biotoxins (ASP, AZA and BTX) analyses	II. Training	21	0	0	39,869.94

### 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Regional Training Course in Biotoxins (ASP, AZA and BTX) analyses	- At least 8 ASEAN-SEAFDEC Member Countries participated and trained.	The training course was successfully conducted in Singapore on 2-6 Jun 2014. Twenty-one participants from all 10 ASEAN-SEAFDEC Member Countries attended.	KPI was achieved.
	- Implemented within the budget allocated.	Total expenditure for the training course was USD 39,869.94 which was within the allocated budget of USD 45,000.	KPI was achieved.

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	attached e-file
Nil	-	-

### 5.3 Project Outcomes and Lesson Learned

Project is still in progress.

### 5.4 Major Impacts/Issues

No major issues in the project implementation in 2014.

## PART IV: EVALUATION

### 6. Project Evaluation

Table 8 Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	The course has trained participants on the use of chemical-based instrument based techniques for biotoxins analyses through a series of lectures and hands-on practical sessions which the participants had found very useful and beneficial to their area of work. The participants gained knowledge and skills in the analyses of these biotoxins and will be able to set up these methods to upgrade their laboratory capabilities to conduct the biotoxins analyses.	-

<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>	The training course has contributed to the project's objective of upgrading regional laboratory capabilities and credibility in biotoxins analyses as well as the capability to establish biotoxins monitoring programmes for routine surveillance in Member Countries.	-
<i>Which has benefited on society and sector?</i>	The key beneficiaries 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 international and domestic consumers/buyers.	-
<i>Have products and benefits been maintained?</i>	Project still in progress.	-

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 03201002			
<b>Program Categories:</b>	Programs under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Traceability Systems for Aquaculture Products in the ASEAN Region		
<b>Program Thrust:</b>	II	<b>Total Duration:</b>	2010-2014
<b>Lead Department:</b>	MFRD Programmes	<b>Lead Country:</b>	Singapore
<b>Project Sponsor:</b>	Japanese Trust Fund V	<b>Project Partner:</b>	Post-Harvest Technology Centre, Agri-Food and Veterinary Authority of Singapore (PHTC/AVA)
<b>Proposed Budget:</b>	USD 152,618	<b>This year budget:</b>	[2014] USD 24,500
<b>Prepared by</b>	Loh Tunxi, Felicia, Scientist (PHTC/AVA); Yeap Soon Eong, Chief of MFRD Programmes	<b>Project Leader</b>	Loh Tunxi, Felicia, Scientist (PHTC/AVA)

## 1. INTRODUCTION/BACKGROUND

Traceability has become a major concern of the aquaculture industry, especially since it has become a legitimate requirement in major international markets such as the EU and the US. Furthermore as aquaculture production becomes more market and consumer driven, the greatest pressure for product traceability has been coming from the general public. Consumers are getting more and more concerned on what they eat – whether the food comes from a safe and sustainable source, and whether production, transportation, and storage conditions can guarantee food safety.

The Codex Alimentarius Commission (2004) defines traceability or product tracing as “The ability to follow the movement of a food through specified stage(s) of production, processing and distribution”. In an increasingly competitive food system, traceability has become a major tool in dealing with concerns of food safety, quality assurance, risk prevention, and gaining consumer trust. Traceability can be used to achieve different purposes or objectives, such as for food safety, bio-security and regulatory requirements or to ensure quality and other contractual requirements. For instance, external traceability allows the tracking of a product and/or attribute(s) of that product through the successive stages of the distribution chain (from farm to fork), while internal traceability (or enterprise traceability) is aimed at productivity improvement and cost reduction within a production unit (*e.g.* fish plant). Governments and organizations around the world have also been developing different systems on seafood traceability *e.g.* TraceFish (EU), TraceShrimp (Thailand).

In this project, the stakeholders would consist of the ASEAN member countries namely: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

Some countries in the ASEAN region which are major exporters of seafood have begun implementation of traceability systems for their aquaculture products such as Thailand (shrimps) and Vietnam (catfish). However, with increasing requirements for traceability in the international seafood markets, there is an urgent need for all countries in the region to implement traceability systems in their aquaculture industry so as to comply with the regulations of the importing countries. In addition, domestic consumers in the region who are becoming more affluent and educated also demand that a higher level of food safety and quality in their seafood. In view of these developments, MFRD has proposed a project on traceability for aquaculture products in the ASEAN region to provide a platform for the sharing of information and experiences among the ASEAN member countries on traceability systems to better enable the regional aquaculture industries to implement appropriate traceability systems in aquaculture products and to meet international traceability requirements in the network of aquaculture production, marketing, and trade.



The project is in line with the following Resolution and Plan of Action as endorsed at the ASEAN-SEAFDEC Conference of 2011:

Resolution 19: Support the competitiveness of the ASEAN fish trade through the development of procedures and programmes 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.

Plan of Action D60: Develop traceability systems, with mechanisms 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.

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: Enhancing Capacity & Competitiveness to Facilitate International and Intra-regional Trade.

## **2. PROJECT**

### **2.1 Goal/Overall Objectives and Performance Indicators**

The goal of the project is to enhance the competitiveness of the region's aquaculture products through the implementation of traceability in the aquaculture production and supply chain. The objectives of the project are to:

1. Provide a platform for the sharing of information and experiences among ASEAN member countries on implementation of traceability systems for aquaculture products in the region as well as an overview of the status of implementation of traceability systems in the aquaculture industries in the ASEAN Region; and
2. Enhance regional capability on implementation of traceability systems for aquaculture products and promote their implementation in the region.

The performance indicators of the project are the development of regional guidelines on traceability system for aquaculture products in South East Asia and the establishment of traceability programmes for aquaculture products in member countries especially those which do not yet have such programmes in place.

### **2.1 Expected Outcomes and Outputs**

The key outcomes of the project are envisaged to be the establishment of traceability programmes for aquaculture products in the member countries and enhanced capability and knowledge on the development and implementation of traceability systems for aquaculture products in the member countries. The key outputs are

1. Two regional on-site training workshops – 1<sup>st</sup> on-site in Vietnam and 2<sup>nd</sup> on-site in Thailand;
2. Technical Compilation on traceability systems for aquaculture products in the ASEAN Region which will collate the information and data from the two on-site workshops and include country reports on the status of implementation of traceability for aquaculture products, difficulties faced and benefits of implementing traceability systems for aquaculture products; and
3. Regional guidelines on traceability systems for aquaculture products in South East Asia.

### **2.2 Project Description/Framework**

The Post-Harvest Technology Centre (PHTC) of the Agri-Food and Veterinary Authority (AVA) as the Collaborating Center for MFRD programmes will be responsible for the project and will manage and coordinate all project activities. The project will be conducted for a period of 5 years from 2010-2014 and funded under the Japanese Trust Fund V program on a cost-sharing basis with the participating ASEAN-SEAFDEC Member Countries. The project will be implemented through the following activities:

**Activity 1: Regional Technical Consultation (RTC)**

A RTC will be held in Singapore to initiate the project. All ASEAN-SEAFDEC Member Countries will be invited to participate and to provide an overview on implementation of traceability systems for aquaculture products in their countries. The RTC will also discuss on the project and its activities.

**Activity 2: Regional On-site Training Workshops on traceability systems for aquaculture products**

**Sub-Activity 2.1: 1<sup>st</sup> Regional On-site Training Workshop**

The workshop program will include lectures on traceability systems and site visits to a fish aquaculture farm and a fish processing factory where the fish are processed into fillets to enable the participants to learn how traceability is implemented throughout the whole production chain. At the end of the workshop the participants will have a better understanding and knowledge on implementation of traceability systems for aquaculture fish.

**Sub-Activity 2.2: 2<sup>nd</sup> Regional On-site Training Workshop**

The workshop program will include lectures on traceability systems and site visits to a shrimp aquaculture farm and a shrimp processing factory. Regional as well as local expertise will be engaged to conduct the workshop. At the end of the workshop the participants will have a better understanding and knowledge on implementation of traceability systems for aquaculture shrimp.

**Activity 3: Mid-Term Project Review Meeting**

To review the progress of the project and the activities conducted. At the review meeting, participants will be providing updates on the implementation status of traceability systems for aquaculture products in their respective countries. The meeting will also discuss and plan for the 2<sup>nd</sup> on-site regional training workshop.

**Activity 4: Documentation and publication of Technical Compilation and Regional Guidelines**

After the conduct of the two on-site workshops, MFRD will compile the information and recommendations provided and use them to publish a Technical Compilation on traceability systems for aquaculture products in the ASEAN Region and the Regional Guidelines on traceability systems for aquaculture products in South East Asia in 2014. The Technical Compilation will include country reports on the status of implementation of traceability for aquaculture products, difficulties faced and benefits of implementing traceability systems for aquaculture products.

**Activity 5: End-Of-Project Seminar (EOP)**

The EOP will be held in the third quarter of 2014 to conclude the project and to share the results of the project among member countries. The EOP will also discuss and finalize the Technical Compilation and the Regional Guidelines for publication. At the EOP, the participants will also present their proposed plans for implementing traceability systems for aquaculture products in their country.

**3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2014**

**3.1 Activities Achievements in the Year 2014**

<b>Achievements based on Activities</b>	<b>Duration</b>	<b>Remarks</b>
Activity 4: Documentation and publication of Technical Compilation and Regional Guidelines	8-10 months	Preparation of the Technical Compilation and Regional Guidelines began after the 2 <sup>nd</sup> on-site workshop, and these compilation and guideline are scheduled for publication in 2014. The Technical Compilation and the Regional Guidelines on traceability systems for aquaculture products in South East Asia to be developed and published by the project would serve as a useful resource and common reference which could be used by Member Countries to assist in their

<p>Activity 5: End –Of- Project (EOP) Workshop</p>	<p>2 Days</p>	<p>implementation of traceability systems for aquaculture products and in the future formulation and development of national plan of activities to promote traceability. The training materials of the two on-site workshops can also be used for human resource and capacity building programs and activities in the Member Countries.</p> <p>The EOP will be organized to conclude the project and to share the results of the project among member countries. The EOP will serve as a sharing platform for the Member Countries to provide a final update on the implementation status of traceability systems for aquaculture products and or proposed plans for implementation, challenges faced during implementation in their respective countries, and to discuss possible future projects. The EOP will also discuss and finalize the Technical Compilation and the Regional for publication.</p>
--	---------------	--

### 3.2 Evaluation of the Project Outcomes Till the Year 2014

#### 3.2.1 Theme/Program Thrust and Issues:

<p><b>(1) Theme/Program Thrust:</b> Traceability systems for aquaculture products in the ASEAN region/ Thrust II: Enhancing Capacity &amp; Competitiveness to Facilitate International and Intra-regional Trade</p>
<p><b>(2) Issues in the region at the beginning of the study:</b> Traceability has become a major concern of the aquaculture industry, especially since it has become a legitimate requirement in major international markets such as the EU and the US. Furthermore as aquaculture production becomes more market and consumer driven, the greatest pressure for product traceability has been coming from the general public. Consumers are getting more and more concerned on what they eat – whether the food comes from a safe and sustainable source, and whether production, transportation, and storage conditions can guarantee food safety.</p> <p>The Codex Alimentarius Commission (2004) defines traceability or product tracing as “The ability to follow the movement of a food through specified stage(s) of production, processing and distribution”. In an increasingly competitive food system, traceability has become a major tool in dealing with concerns of food safety, quality assurance, risk prevention, and gaining consumer trust. Traceability can be used to achieve different purposes or objectives, such as for food safety, bio-security and regulatory requirements or to ensure quality and other contractual requirements. For instance, external traceability allows the tracking of a product and/or attribute(s) of that product through the successive stages of the distribution chain (from farm to fork), while internal traceability (or enterprise traceability) is aimed at productivity improvement and cost reduction within a production unit (<i>e.g.</i> fish plant). Governments and organizations around the world have also been developing different systems on seafood traceability <i>e.g.</i> TraceFish (EU), TraceShrimp (Thailand).</p> <p>In view of these developments, MFRD has proposed a project on traceability for the aquaculture products in the ASEAN region to provide a platform for the sharing of information and experiences among the ASEAN member countries on traceability systems to better enable the regional aquaculture industries to implement appropriate traceability systems for aquaculture products and to meet international traceability requirements in the network of aquaculture production, marketing, and trade.</p>

#### 3.2.2 Expected Final Goal of the Project:

- |   |
|---|
| <ul style="list-style-type: none"> <li>- Provide a platform for the sharing of information and experiences among ASEAN Member Countries on implementation of traceability systems for aquaculture products in the region as well as an overview of the status of implementation of traceability systems in the aquaculture industries in the ASEAN Region.</li> <li>- Enhance regional capability on implementation of traceability systems for aquaculture products and promote their implementation in the region.</li> </ul> |
|---|

### 3.2.3 “Steps” Toward Achieving Final Goal:

<p>Step 1: Regional Technical Consultation in Traceability Systems for Aquaculture Products in ASEAN Region</p> <ul style="list-style-type: none"> <li>- Deliberate on the scope of the project which covers technical compilation on traceability systems for aquaculture products in the ASEAN region and on-site training on traceability systems for aquaculture products.</li> <li>- Identify regional expertise with knowledge and experience in developing and implementing traceability systems for aquaculture products to conduct on-site training and to develop the relevant training materials.</li> <li>- Identify suitable sites for the on-site training on traceability systems for aquaculture products (fish farm and shrimp farm) with suitable co-operant.</li> </ul>
<p>Step 2: Regional On-site Training Workshops on Traceability Systems for Aquaculture Products in ASEAN Region</p> <ul style="list-style-type: none"> <li>- To build up capacity in ASEAN member states for knowledge in traceability systems for aquaculture products</li> <li>- To facilitate implementation of traceability systems for aquaculture products for interested parties from ASEAN member states</li> </ul>
<p>Step 3: Mid-Term Project Review Meeting</p> <ul style="list-style-type: none"> <li>- To review the progress of the project and activities conducted.</li> <li>- To provide an update on the implementation status of traceability systems for aquaculture products in the ASEAN Region.</li> <li>- To discuss on the future project activities.</li> </ul>
<p>Step 4: Documentation and Publication of Technical Compilation and Regional Guidelines</p> <ul style="list-style-type: none"> <li>- To prepare and compile technical information and regional guidelines on traceability systems for aquaculture products in ASEAN region. The technical information will include country reports, challenges faced and benefits of implementing traceability systems for aquaculture products.</li> </ul>
<p>Step 5: End-of-Project Seminar</p> <ul style="list-style-type: none"> <li>- To conclude the project and provide a final update on the implementation status of traceability systems for aquaculture products in the ASEAN Region</li> <li>- To discuss and finalize for publication the Technical Compilation on traceability systems for aquaculture products in ASEAN region including the Regional Guidelines.</li> <li>- To discuss the challenges faced during the project implementation and discuss possible future projects.</li> </ul>

### 3.2.4 Activities in the Current Project:

<b>(1) Current position of the project:</b> ( Step 4 & 5)
<b>(2) Program duration:</b> (2010-2014)
<p><b>(3) Main activities:</b></p> <ul style="list-style-type: none"> <li>- Regional Technical Consultation in Traceability Systems for Aquaculture Products in ASEAN Region.</li> <li>- 1<sup>st</sup> and 2<sup>nd</sup> Regional On-site Training Workshops on Traceability Systems for Aquaculture Products in ASEAN Region.</li> <li>- Mid-Term Project Review Meeting.</li> <li>- Documentation and Publication of Technical Compilation and Regional Guidelines.</li> <li>- End-of-Project Seminar.</li> </ul>

### 3.2.5 Progress and Achievements of the Current Project:

<p><b>(1) Main activities conducted in the current project</b></p> <ul style="list-style-type: none"> <li>- The Regional Technical Consultation on Traceability Systems on Aquaculture Products in the ASEAN Region in 2010.</li> <li>- 1<sup>st</sup> Regional On-site Training Workshop on Traceability Systems for Aquaculture Fish in ASEAN Region in 2011.</li> <li>- Mid-Term Project Review Meeting in 2012.</li> <li>- 2<sup>nd</sup> Regional On-site Training Workshop on Traceability Systems for Aquaculture Shrimps in ASEAN Region in 2013.</li> <li>- Documentation and Publication of Technical Compilation and Regional Guidelines in 2014.</li> <li>- End-of-project Seminar in 2014.</li> </ul>
--

**(2) Main achievements till the end of 2014 (tentative)**

- The RTC meeting was successfully conducted held from 12-14 October 2010 in Singapore. The meeting decided on all the project activities and time schedule. The meeting agreed to conduct the 1<sup>st</sup> on-site workshop on traceability systems for aquaculture fish in Vietnam in 2011 and the 2<sup>nd</sup> on-site workshop on traceability systems for aquaculture shrimp in Thailand in 2013.
- The 1<sup>st</sup> Regional On-site Training Workshop was conducted in Vietnam from 28-30 Nov 2011 to provide training in implementation of traceability system for aquaculture fish to the Member Countries and help build up their capability and knowledge in this area. The workshop was attended by 23 participants from the 10 ASEAN member states. The training comprised of key presentations by regional experts and consultants in aquaculture traceability and field trips to a fish processing factory and aquaculture fish farm to allow the participants to have hands-on experience on how traceability is implemented in an industrial setting. In addition, group discussions were held to deliberate on the challenges faced in implementing traceability for aquaculture products in their countries as well as possible solutions. The workshop concluded with the establishment of generic supply chains for the aquaculture industry in ASEAN and identification of key information that needs to be shared amongst the stakeholders in these supply chains to ensure that the aquaculture product can be traced back to the source.
- The Mid-Term Project Review Meeting was successfully held on 7-8 Nov 2012 in Singapore. The meeting reviewed the progress of the project and the activities conducted thus far. The participants provided updates on the implementation status of traceability systems for aquaculture products in their respective countries. The meeting also discussed and planned for the 2<sup>nd</sup> on-site regional training workshop to be held in 2013 in Thailand taking into consideration the recommendations of the 1<sup>st</sup> regional on-site training workshop in 2011 to ensure that the training will be more effective and beneficial to the participants of the workshop.
- The 2<sup>nd</sup> Regional On-site Training Workshop on Traceability Systems for Aquaculture Shrimp in ASEAN Region was held on 5-7 November 2013 in Bangkok, Thailand. The workshop was attended by 23 participants from the 10 ASEAN member states. The training comprised of key presentations by a regional expert in aquaculture traceability and field trips to a shrimp aquaculture farm and processing factory to allow the participants to have hands-on experience on how traceability is implemented in an industrial setting. The workshop concluded with a discussion on generic supply chains for the aquaculture shrimp in ASEAN and identification of key information that needs to be shared amongst the stakeholders in these supply chains to ensure that the product can be traced back to the source.
- Publication of the Technical Compilation and Regional Guidelines in 2014.
- The End-of-Project (EOP) seminar will be held on 16-17 December 2014 (tentative).

**(3) Outcomes/Outputs during the project period and expected achievement rate till the end of 2014 (tentative)**

Expected outcomes/outputs	Achievement rate (%)
Provide a platform for the sharing of information and experiences among ASEAN member countries on implementation of traceability systems for aquaculture products in the region as well as an overview of the status of implementation of traceability systems in the aquaculture industries in the ASEAN Region.	100%
Enhance regional capability on implementation of traceability systems for aquaculture products and promote their implementation in the region.	100%

**3.2.6 Evaluation of Project Activities in 2014:**

The EOP will be organized to discuss and finalize the Technical Compilation on traceability systems for aquaculture products in the ASEAN Region and the Regional Guidelines on Traceability System for Aquaculture Products in Southeast Asia for publication. The Technical Compilation and the Regional Guidelines will serve as a useful resource and common reference which could be used by Member Countries to assist in their implementation of traceability systems for aquaculture products and in the future formulation and development of national programmes and activities to promote traceability. It is envisaged that these project activities will help to achieve the project's objective to enhance regional capability and knowledge on implementation of traceability systems for aquaculture products and promote their implementation in the region thereby contributing to the overall program thrust of enhancing capacity and competitiveness to facilitate international and intra-regional trade in aquaculture products.

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 02201003
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of sustainable aquaculture and resource enhancement in Southeast Asia: Accelerating information dissemination and capacity building in fish health management in Southeast Asia.		
<b>Program Thrust:</b>	II	<b>Total Duration:</b>	5 years (2010-2014)
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines
<b>Project Sponsor:</b>	JTF	<b>Project Partner:</b>	None
<b>Proposed Budget:</b>	USD 248,076	<b>This year budget:</b>	2014 USD 42,300
<b>Prepared by</b>	Takuro Shibuno, AQD DC	<b>Project Leader</b>	Takuro Shibuno, AQD DC

## 1. INTRODUCTION/BACKGROUND

The Aquaculture Department of SEAFDEC (SEAFDEC/AQD) has been responsible for this project, including the management and coordination of all project activities. Other ASEAN Member States which were identified as core countries in the project are involved in implementing the relevant activities on a cost-sharing basis.

In response to many requests for intensive research to address fish health problems, SEAFDEC/AQD initiated the Fish Disease Projects through Japanese Trust Fund. Phase I (2000 to 2004) 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.

This project involves the following: 1) compilation of case studies that explain the problems and challenges and possible solutions to the implementation of fish health care in rural aquaculture, and to boost staff capability as well as develop and produce learning materials to further disseminate and sustain the activity; 2) surveillance on the fish-borne zoonotic parasites of freshwater fish along with on-site training for capacity building of fish health workers on disease management strategies to reduce or prevent the spread of zoonotic parasitic diseases; 3) refinement and application of molecular diagnostic methods for the detection of fish and shrimp viral diseases and preventive approaches that will enable the farmer to monitor the health status of their crop so that early and effective intervention strategies can be made; 4) establishment of immunization regimen for the prevention of viral nervous necrosis in high value marine fish; 5) establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important maricultured fish; 6) evaluation of various carriers for shrimp vaccination and to establish practical delivery methods and efficacy under field conditions, and 7) elucidation of parasitic and shell diseases of abalone with their diagnosis, pathogenicities and prevention methods.

Thus this project on fish health management, which could be designated as Phase III (2010-2014), focuses on the acceleration of delivery of information and awareness building among the aquafarmers. In particular, the rationale of the present project is on the greater dissemination of the said knowledge, especially to the Member Countries whose fish health management capacity still needs to be developed and improved. Dissemination activities especially in Myanmar, Cambodia, Laos PDR and the Philippines need to be enhanced and accelerated because technical and administrative systems to carry out the tasks and duties necessary for the efficient control of diseases and for consumer protection are still inadequate.

At the same time, research and technology development should remain as significant activities to sustain SEAFDEC's role as "A Leading Fish Disease Technology Center in the Region". An integrated fish-health-care system expected to be established through this project will ensure a holistic approach to a stable supply of safe aquaculture products.

Project monitoring and evaluation will include annual progress reports, regular meetings and workshop.

All the activities/sub-activities involved in this project are in line with the Resolution and Plan of Action, which were endorsed in ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 held at Bangkok in June 2011.

## **2. PROJECT**

### **2.1 Goal/Overall Objectives and Performance Indicators**

This Project aims to:

- 1) Accelerate awareness about fish health management in resource-deprived countries through industry-wide capacity building;
- 2) Guarantee food safety and sustainable production through innovative research; and
- 3) Disseminate output of the project.

The performance indicators are as follows.

- 1) Compilation of case studies that explain the problems and challenges and possible solutions to the implementation of fish health care in rural aquaculture, and to boost staff capability as well as develop and produce learning materials to further disseminate and sustain the activity;
- 2) Surveillance on the fish-borne zoonotic parasites of freshwater fish along with on-site training for capacity building of fish health workers on disease management strategies to reduce or prevent the spread of zoonotic parasitic diseases;
- 3) Refinement and application of molecular diagnostic methods for the detection of fish and shrimp viral diseases and preventive approaches that will enable the farmers to monitor the health status of their crop so that early and effective intervention strategies can be made;
- 4) Establishment of immunization regimen for the prevention of viral nervous necrosis in high value marine fish;
- 5) Establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important maricultured fish;
- 6) Evaluation of various carriers for shrimp vaccination and to establish practical delivery methods and efficacy under field conditions; and
- 7) Elucidation of parasitic and shell diseases of abalone with their diagnosis, pathogenicities and prevention methods.

### **2.2 Expected Outcomes and Outputs**

Aquaculture is one of the most important industries in this region, and fish diseases are the biggest cause that prevents the development of aquaculture. From the viewpoint of the prevention of fish diseases, it is very important to accelerate the delivery of information and to build the awareness among the aquafarmers. Fish diseases are currently prevalent in the aquaculture industry and problems related to fish health management will increase with further intensification and diversification. Studies on disease prevention that are currently the focus of studies in this program are appropriate and timely as well as work on emerging diseases particularly on new aquaculture species such as abalone. The studies on zoonotic parasitic diseases also need to be investigated especially since the areas where these diseases are likely to occur involve small-holder farms in relatively undeveloped areas and where information are not readily accessible. Immunization protocols, and vaccine development and application should be further explored and expanded to include tests in private farms.

All the activities under the project showed good progress. In particular, the activities related to technology extension to the lesser developing countries are highly evaluated. Development of methodologies for molecular diagnosis of virus diseases incurring devastating damages and for carriers for practical delivery of vaccines is also excellent. As a whole, the skill improvement in the lesser developing countries and countermeasures to the presently focused diseases using new approaches through innovated study are well balanced together with the persistent effort for extension of information on health management of the aquaculture species in this project. On the other hand, the flexible attendance toward the emerging diseases would be increasingly required in the future.

## 2.3 Project Description/Framework

**Activity 1:** Accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building

*Sub-activity 1.1 Survey on the status and needs of primary aquatic animal health care in small-scale aquaculture*

Accelerating awareness about aquatic animal health management is needed in resource-deprived member countries of ASEAN. The present study will have components that are aimed to highlight the needs of health care in rural and small-scale aquaculture focusing on crustaceans and shellfishes, including those of interest to cooperatives, farmer organizations, and governments of SEAFDEC member countries for stock enhancement purposes. Through the present study, staff capability in this field will be boosted through training courses and e-Learning for trainers program that will further disseminate information within the country.

*Sub-activity 1.2 Surveillance and training of fishborne zoonotic parasites of commercially important freshwater fish in some Southeast Asian countries*

Pertinent data on the parasite fauna in economically important freshwater fish species used as food in some member countries in Southeast Asia (Myanmar, Lao PDR, and Cambodia) have not been fully investigated. The present study conducts investigation on occurrence of parasite fauna of freshwater fish not only utilizing available diagnostic methods but also developing the methods for new or emerging diseases. Additionally, it is also the aim of this sub-activity to train and enhance the skills of research collaborators of mentioned member countries on on-site samplings and parasite identification. Surveillance data will provide baseline information on parasite fauna and trainee will be able to carry out the research work independently.

**Activity 2:** Innovative Research to Guarantee Food Safety and Sustainable Production

*Sub-activity 2.1 Molecular diagnosis and prevention of economically-important viruses in fish and shrimp*

Understanding of susceptibility and resistance to, and the threshold levels of viral diseases are essential components to accelerate awareness and capacity-building in fish health management. The present sub-activity will develop and optimize quantitative polymerase chain reaction (Q-PCR)-based detection method and loop-mediated isothermal amplification (LAMP) protocols for screening of fish and shrimp viruses. Information on species differences in susceptibility to WSSV among local shrimp species could be used as basis in choosing alternative species for culture.

*Sub-activity 2.2 Establishment of immunization regimen for the prevention of viral nervous necrosis in high value marine fish*

Serious mortality in seabass and several species of grouper caused by nervous necrosis virus (NNV) is a heavy challenge which should be overcome. Through vaccination study of potential broodstock candidates, vaccine safety and dosage will be optimized, and the correct booster vaccination schedule and the duration of protection in larvae conferred by maternal antibodies will be established and investigated in the present sub-activity. The expected outcomes will practically contribute toward establishment of sound fish health management program.

*Sub-activity 2.3 Establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important cultured fish*

Prophylactic and therapeutic approaches, which utilize antiviral substances extracted from not only ambient waters containing microorganisms but also aquatic organisms including fishes themselves, are strongly recommended as novel methods for fish health management in Southeast Asia. This sub-activity aims to isolate indigenous bacteria from wild and cultured marine fishes possessing antiviral potential against important viral diseases and to screen antiviral substances from seaweeds that are indigenous in the Philippines. The isolation, purification and optimization of antiviral compounds from indigenous



bacteria and seaweeds will be useful in controlling current and future viral infections especially affecting high-value marine fish species.

**Sub-activity 2.4** *Evaluation of carriers for practical delivery of vaccines to shrimp and other crustaceans*

Studies on vaccine carriers have advanced in the last decade with the main objective of preventing bacterial diseases. However, they deserve further investigation to develop a practical and economically viable technology. The present sub-activity will screen various vaccine carriers such as live and inactivated recombinant bacteria, lactic acid bacteria, lipid vesicles, and chitosan, conduct booster-vaccination trials, test various delivery routes, test the vaccine in different species of shrimps and crabs, and to conduct field trails to verify efficacy under farm conditions. The availability of oral vaccines for shrimp would make booster-vaccination during grow-out culture possible. Reducing virus-associated mortality in shrimp culture will result in sustainable shrimp production.

**Sub-activity 2.5** *Parasitic and shell diseases of abalone (Haliotis asinina) in Philippines*

Although abalone is becoming economically important recently, the occurrences of parasite fauna of abalone remain unknown. To increase the food safety level, understanding of infestation status and development of control method is a very urgent matter. The present study will survey parasites of wild and cultured abalone in the Philippines. Through the surveillance programs, the diagnosis of infection, pathology and the host-pathogen relationship will be described and used a tool to develop effective solution of disease control.

**Activity 3:** Dissemination of Output of the Project

**Sub-activity 3.1** *Publication of new information into popular materials*

Manuals, posters, pamphlets and flyers describing disease prevention methods will be published and distributed.

**Sub-activity 3.2** *Maintenance and updating of website contents*

Updated information on fish diseases management will be obtained from research results, scientific publications and the internet and help increase of productivity and food safety.

**Activity 4:** Annual progress meeting and international workshop

**Sub-activity 4.1** *Annual progress meeting*

Annual meeting organized by SEAFDEC/AQD will be held to review the project achievement. Evaluators will be invited to join the meeting to review/evaluate the project achievements.

**Sub-activity 4.2** *International workshop*

The workshop will not only receive participants from member countries but also invite expert scientists as key note speakers to facilitate to spread and exchange brand-new information on fish health management between SEAFDEC and various institutions.

**Activity 5:** Coordination by the project leader

The project leader will coordinate and encourage the research, training and dissemination, and also facilitate information exchange not only between activities but also among member countries.



Achievements based on Activities	Duration	Remarks
- Examined the prophylactic and therapeutic efficacy of <i>U. pertusa</i> aqueous extract against the above fish pathogenic bacteria in vivo through experimental infection	Jan-Aug	
- Determined the anti-nervous necrosis virus activity of <i>U. pertusa</i> aqueous extract in vitro	Jan-Aug	
- Tested the prophylactic and therapeutic efficacy of <i>U. pertusa</i> aqueous extract against nervous necrosis virus in vivo through experimental infection.	Jul-Dec	
2.4. Evaluation of carriers for practical delivery of vaccines to shrimp and other crustaceans		
- Challenge trials with different vaccine-carrier ratios and dosages were conducted in shrimp/ crustacean species other than <i>P. monodon</i> .	Jan-Aug	
2.5. Parasitic and shell diseases of abalone ( <i>Haliotis asinina</i> ) in Philippines		
- Examination of reproductive characteristics of shell-boring polychaetes using scanning electron microscope (SEM) was done	Jan-May	
- Continued parasitological screening of hatchery-reared abalone from different sites	Apr-Jun	
- Confirmatory runs on the mode of infestation (cohabitation) were continued	Apr-Jun	
- Guideline of prevention and control method for shell-boring polychaetes infections has been formulated.	Aug-Dec	

### 3.2 Evaluation of the Project Outcomes Till the Year 2014

#### 3.2.1 Theme/Program Thrust and Issues:

<b>(1) Theme/Program Thrust:</b> Accelerating awareness and capacity-building in fish health management in Southeast Asia
<b>(2) Issues in the region at the beginning of the study:</b> Global aquaculture production is continuously increasing. However, outbreaks of fish diseases still significantly hinder healthy management of aquaculture animals, and continue to bring considerable economic losses in the fisheries and aquaculture sectors worldwide. The control of fish diseases and the promotion of fish health under farming conditions are essential components of aquaculture to ensure a stable supply of fish products. Aquaculture in the region is seen as a major sector that will augment the declining global fish production because it can feed not only the growing ASEAN population but it will also meet the demand for fish by global trade partners including Japan. The status of fish health management remains generally poor in some ASEAN countries, although remarkable technical advances in the diagnosis, prevention and control of fish diseases have occurred worldwide. This requires not only technical development to enhance health of important aquatic species in Southeast Asia fisheries and aquaculture, but also the urgent acceleration of awareness and capacity building in fish health management in Southeast Asia.

#### 3.2.2 Expected Final Goal of the Project:

<ul style="list-style-type: none"> <li>- To compile case studies that explain the problems and challenges and possible solutions to the implementation of health care in rural aquaculture, and to boost staff capability as well as learning materials to further disseminate and sustain the activity</li> <li>- To investigate fishborne zoonotic parasites of commercially important freshwater fish and its diagnosis, pathology and host-parasite relationship</li> <li>- To implement molecular diagnostic method for the detection of fish and shrimp viral diseases and preventive approaches that will enable the farmer to monitor the health status of their crop so that early and effective intervention strategies can be made</li> <li>- To establish immunization regimen for the prevention of viral nervous necrosis for high value marine fish</li> <li>- To establish novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important maricultured fish</li> <li>- To evaluate various carriers for shrimp vaccination and to establish practical delivery methods and efficacy under field conditions</li> </ul>
--

- |   |
|---|
| <ul style="list-style-type: none"> <li>- To elucidate the parasitic diseases as well as symbionts of abalone among wild and cultured populations</li> <li>- To disseminate output of the project</li> </ul> |
|---|

### 3.2.3 “Steps” Toward Achieving Final Goal:

<p><b>Step 1:</b></p> <ul style="list-style-type: none"> <li>- Improvement of awareness about fish health management in member countries through industry-wide capacity building</li> <li>- Surveillance of health status program to assess the presence and prevalence of fishborne zoonotic parasites in freshwater fish in Cambodia, Lao PDR and Myanmar</li> <li>- Development and optimization of Q-PCR and LAMP protocols for detection of fish and shrimp viral diseases</li> <li>- Vaccination of potential broodstock of various marine fish and optimization of vaccine safety and dosage</li> <li>- Isolation of indigenous bacteria and viruses with antiviral potentials and screening of antibacterial and antiviral compounds from seaweeds</li> <li>- Field trial to determine the efficacy of formalin-killed vaccine against WSSW and screening of suitable carriers for vaccine delivery in shrimp</li> <li>- Epidemiological investigation of parasitic diseases in hatchery-reared abalone</li> <li>- Implementation of training course</li> </ul>
---



<p><b>Step 2:</b></p> <ul style="list-style-type: none"> <li>- Conduct training course to improve awareness about fish health management</li> <li>- Training of counterparts in host countries on on-site sampling and identification of disease or disease-causing organisms</li> <li>- Determination of threshold levels of Koi herpes virus, viral nervous necrosis and Iridovirus in fish and white spot syndrome virus, infectious hypodermal and hematopoietic necrosis virus, Taura syndrome virus and infectious myonecrosis virus in shrimp</li> <li>- Determination of the correct timing/schedule of booster vaccination</li> <li>- Screening of bacteria and bioactive compounds from seaweeds for their antiviral activity in vitro and in vivo</li> <li>- Tests of booster immunization schemes and various delivery methods</li> <li>- Epidemiological investigation of parasitic diseases in the grow-out of abalone in Igang Marine Station</li> <li>- Workshop/seminar</li> </ul>
---



<p><b>Step 3:</b></p> <ul style="list-style-type: none"> <li>- Plan and implement guided research and information dissemination</li> <li>- Completion of baseline information on fishborne zoonotic parasite fauna found in wild and cultured freshwater fish in Southeast Asian region</li> <li>- Application of Q-PCR and LAMP optimized protocols in surveillance and diagnosis of fish and shrimp viruses and susceptibility experiment</li> <li>- Investigation on the duration of protection in larvae conferred by maternal antibodies and selection of less stressful routes of booster vaccine administration</li> <li>- Characterization and purification of the novel antiviral compounds from bacteria and seaweeds and assay of their efficacy</li> <li>- Test of vaccine efficacy in different shrimp species under laboratory conditions and verify the efficacy under farm conditions</li> <li>- Description of diagnosis of infection, accomplishment of infection bioassay and establishment of methods of prevention</li> <li>- Dissemination of output of the project</li> </ul>
--



### 3.2.4 Activities in the Current Project:

(1) <b>Current position of the project:</b> Step 3
--

(2) <b>Total project duration:</b> 2010-2014
--

(3) <b>Main activities</b>
----------------------------

- |   |
|---|
| <ul style="list-style-type: none"> <li>- Accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building             <ul style="list-style-type: none"> <li>• Survey on the status and needs of primary aquatic animal health care in small-scale aquaculture</li> <li>• Surveillance and training on parasite fauna of freshwater fish in some Southeast Asian countries</li> </ul> </li> <li>- Innovative Research to Guarantee Food Safety and Sustainable Production             <ul style="list-style-type: none"> <li>• Molecular diagnosis and prevention of economically-important viruses in fish and shrimp</li> </ul> </li> </ul> |
|---|

- Establishment of immunization regimen for the prevention of viral nervous necrosis in high value marine broodfish
- Establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important maricultured fish
- Evaluation of carriers for practical delivery of vaccines to shrimp and other crustaceans
- Parasitic and shell diseases of abalone (*Haliotis asinina*) in Philippines
- Dissemination of output of the project through publication and international workshop

### 3.2.5 Progress and Achievements of the Current Project:

<b>(1) Main activities conducted in the current project</b>	
<ul style="list-style-type: none"> <li>- Equipping the Fish Health staff in target countries with capabilities to do disease surveillance and to conduct simple research related to diseases and food safety</li> <li>- Investigation on the fishborne zoonotic parasite fauna in both wild and cultured freshwater fish of some member countries and examination of its diagnosis of infection, pathology and the host-parasite relationship</li> <li>- Development of Q-PCR-based detection method for fish and shrimp viral pathogens</li> <li>- Establishment of immunization regimen for the production of VNN-resistant sea bass and grouper brood stocks</li> <li>- Isolation of indigenous bacteria, fungi and viruses from wild and cultured freshwater and marine fishes, and indigenous seaweeds, that possess antiviral properties against important viral diseases</li> <li>- Provision of preliminary information for a later field trial with vaccines delivered by a vector/carrier</li> <li>- Investigation on shell abnormalities and diseases of abalone with particular reference to parasites</li> <li>- Dissemination of project outputs</li> </ul>	
<b>(2) Main achievements till the end of 2014 (tentative)</b>	
<ul style="list-style-type: none"> <li>- Under the activity “<i>Molecular diagnosis and prevention of economically-important viruses in fish and shrimp</i>”, LAMP assays for WSSV, IHHNV, RSIV and VNN were also optimized and these will serve as an alternative detection methods that are cheap, rapid, specific and can be used on-site.</li> <li>- Annual booster vaccination of pompano broodstocks reared in floating net cages could immunogenically mount the production of NNV-neutralizing antibodies in these fish</li> <li>- Under the activity “<i>Establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important maricultured fish</i>”, <i>Ulva pertussa</i> crude ethanolic extracts showed potent antibacterial activity against freshwater bacterial pathogens</li> </ul>	
<b>(3) Outcomes/Outputs during the project period and expected achievement rate till the end of 2014 (tentative)</b>	
<b>Expected outcomes/outputs</b>	<b>Achievement rate (%)</b>
- To accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building	90%
- To guarantee food safety and sustainable production through innovative research	90%
- To disseminate output of the project	90%

### 3.2.6 Evaluation of Project Activities in 2014:

<p><b>I. Accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building</b></p> <p><b><i>Survey on the status and needs of primary aquatic animal health care in small-scale aquaculture</i></b></p> <ul style="list-style-type: none"> <li>- AQUAHEALTH Online (AHOL) was conducted on alternate years starting in 2010 until 2014. So far, there have been 2 AHOL training courses conducted under the Program. AHOL 2014 has been held from 08 September 2014 to 22 February 2015 (participants: Philippines 3, Lao PDR 1, Cambodia 6, Other 4)(3 Supported by JTF5 fellowship).</li> </ul> <p><b><i>Surveillance and training on parasite fauna of freshwater fish in some Southeast Asian countries</i></b></p> <ul style="list-style-type: none"> <li>- Activities planned for 2014 are parallel sampling for zoonotic parasites in more freshwater culture areas in the Philippines, and the on-site basic training on freshwater fish health management with emphasis on detection of fish-borne zoonotic parasites will be conducted in October 2014 in Lao PDR. Letter of Inquiry will be sent to DLF, Lao PDR after its revision.</li> </ul>
---

## II. Innovative Research to Guarantee Food Safety and Sustainable Production

### ***Molecular diagnosis and prevention of economically-important viruses in fish and shrimp***

- LAMP (Loop mediated isothermal amplification) assays, which is not established commercial kits, for WSSV, IHNV, RSIV and VNN were optimized and will serve as an alternative detection method that is cheap, rapid, specific and can be used on-site.

### ***Establishment of immunization regimen for the prevention of viral nervous necrosis in high value marine fish***

- Annual booster vaccination of pompano broodstocks reared in floating net cages could immunogenically mount the production of NNV-neutralizing antibodies in these fish thereby conferring protection against horizontal transmission of the NNV via contaminated feed or water and consequential vertical transmission of the NNV to their offspring.

### ***Establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important cultured fish***

- Intensification of fish mariculture in Southeast Asia led to the emergence and re-emergence of diseases. Establishment of novel therapeutic and prophylactic approaches is needed to create a sustainable fish farming system. Prophylactic and therapeutic potential of seaweeds against bacterial and viral infections of commercially important maricultured fish species should be exploited.
- *Ulva pertusca* crude ethanolic extracts showed potent antibacterial activity against freshwater bacterial pathogens.

### ***Evaluation of carriers for practical delivery of vaccines to shrimp and other crustaceans***

- The rVP28 'vaccine' were entrapped/encapsulated in alginate and chitosan, and along with naked IBs (Vaccine principal) the complexes were incorporated into the feed and administered orally to the shrimp.
- The carriers+vaccine were administered orally to the shrimp via the feed. Results of the WSSV challenge test showed that survival was highest in IB+chitosan (65.3%), followed by IB+alginate (61.9%), naked IB (50%), inactivated recombinant bacteria (25.9%), and lowest with the unvaccinated group (0%). There were no apparent differences in survival among IB+chitosan, IB+alginate, and naked IB, but they were significantly higher compared to inactivated recombinant bacteria and unvaccinated group.

### ***Parasitic and shell diseases of abalone (*Haliotis asinina*) in Philippines***

- The shell-boring polychaete species found in the shells of abalone were identified belonging to the family *Dorveillidae* (prevalence 41%, at Igang Marine Station). Histological results showed that ciliates (prevalence 38%, at Igang Marine Station) were observed to be large and oval with nuclear material. They were usually found in the gills and digestive gland.
- The condition indices of infested abalone consistently yielded significantly lower condition indices than uninfested abalone. In addition, results of infectivity of shell-boring polychaetes present in uninfested and infested abalones revealed that none of the abalone in control became infested.
- First trial of bath treatment methods against shell-boring polychaetes on abalone using different concentrations (50 ppm, 120 ppm and 200 ppm) of mebendazole was determined under laboratory conditions.

**PROJECT DOCUMENT  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 02201004			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of Sustainable Aquaculture and Resource Enhancement in Southeast Asia: Food Safety of Aquaculture Products in Southeast Asia.		
<b>Program Thrust:</b>	II	<b>Total Duration:</b>	5 years (2010-2014)
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines
<b>Project Sponsor:</b>	JTF	<b>Project Partner:</b>	None
<b>Proposed Budget:</b>	USD 127,683	<b>This year budget:</b>	2014 USD 16,300
<b>Prepared by</b>	Takuro Shibuno, AQD DC	<b>Project Leader</b>	Takuro Shibuno, AQD DC

## 1. INTRODUCTION/BACKGROUND

Surveillance activity of chemical contaminants such as pesticides, mycotoxins and antibiotics will be continued based on the results of TF4. Particularly, the withdrawal period of the antibiotics for tropical aquatic species has not been studied enough to ensure the safety for human consumption, compared to the temperate species.

Antibiotics are used in aquaculture to prevent and treat diseases that affect farmed shrimp and fish. The indiscriminate use of antibiotics could lead to drug resistant strain and multiple antibiotic resistances in bacteria. From the viewpoint of food safety of aquaculture products, there is a pressing need to survey the chemicals used in aquaculture at present.

High performance liquid chromatography (HPLC) is the method of choice for the routine analysis of antibiotic detection. However, antibiotic detection using HPLC requires equipment that is not affordable to small laboratories; and skilled chemists/technicians are needed to do the analysis. Therefore, an alternative method of antibiotic detection that is easy and cost effective is needed.

The expected outputs for the project will include the establishment of guidelines on appropriate administration and withdrawal of chemicals in collaboration with ASEAN. The guidelines will be utilized for some possible action or policy formulations by governments of the ASEAN member countries. Seminars and lectures on food safety awareness for stakeholders will also be conducted.

All the activities/sub-activities involved in this project are in line with the Resolution and Plan of Action, which were endorsed in ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 held at Bangkok in June 2011.

## 2. PROJECT

### 2.1 Goal/Overall Objectives and Performance Indicators

This Project aims to:

- 1) Contribute in the establishment of guidelines on the production of safe aquaculture products from Southeast Asia;
- 2) Determine the presence and levels of commonly used chemicals in aquaculture in aquaculture products such as fish and shrimps;
- 3) Compile and disseminate SEAFDEC guidelines on the use of antibiotics and chemicals in aquaculture to the ASEAN region; and
- 4) Implement training course/workshop to promote food safety awareness in the ASEAN region.

The performance indicators are as follows:

- 1) Detection of withdrawal period of antibiotics in important cultured fishes;
- 2) Surveillance and monitoring of the chemical contaminants in aquaculture products and feeds especially in developing ASEAN member countries;
- 3) Compiling guidelines on appropriate administration and regulation of antibiotics/other chemicals; and
- 4) Implementation of training course/workshop

## **2.2 Expected Outcomes and Outputs**

The project goal of establishing and disseminating guidelines on safe aquaculture products and on use of antibiotics and chemicals is very relevant to the needs of the aquaculture industry in the ASEAN region. This issue is very relevant now with increasing population which requires intensification of fish production to produce more food. Outcomes (Data) of some studies seem to be very good. The study leaders should try to publish the results obtained in the program. This is because the guideline is expected to be made based on the authorized data. The completion of the Guidelines on Chemical use in aquaculture would be the most significant contribution of the Program to the development of sustainable fisheries in the ASEAN region.

## **2.3 Project Description/Framework**

**Activity 1:** Withdrawal periods of antibiotics in some aquatic species cultured in the tropics

Developments in aquaculture discouraged the use of antibiotics because of the risk of developing antibiotic resistance to human pathogen, effect on non-target organisms, safety of workers, and effect on the environment, among others. However, the use of these drugs is sometimes inevitable, especially in an outbreak of a disease.

Withdrawal periods, bioavailability and pharmacokinetic studies of some antibiotics, have been conducted in temperate countries in several species. However, data are very limited, if there is any, for fishes raised in the tropics.

In the present activity, therefore, we will establish withdrawal periods of antibiotics from marine fish such as milkfish and freshwater fish such as tilapia to contribute in the establishment of guidelines on the production of safe aquaculture products from Southeast Asia.

**Activity 2:** Surveillance of chemical contaminants in aquaculture products and feeds

The fast growing aquaculture sector exerted a great demand for aqua feed and feed ingredients. This has translated into adulteration and indiscriminate use of chemicals in commodities. A survey of these chemicals is important in the sustainability of the aquaculture industry, which is much related to the environment.

This activity will determine the presence and levels of commonly used chemicals in aquaculture in aquaculture products such as fish and shrimps, and to determine levels of chemical contaminants, such as antibiotics, fungicides, feed additives, toxin binders *etc.* in aqua feed and feed ingredients, and in aquaculture products.

**Activity 3:** Guidelines on appropriate administration and regulation of antibiotics/other chemicals

The expected outputs for the project will include the establishment of guidelines on appropriate administration and withdrawal of chemicals in collaboration with ASEAN. The guidelines will be utilized for some possible action or policy formulations by governments of the ASEAN member countries.

**Activity 4:** Dissemination of food safety awareness and manual publication

Seminars and lectures on food safety awareness for stakeholders will also be conducted.



**Activity 5:** Annual progress meeting and international workshop

**Sub-activity 5.1** Annual Progress Meeting

Annual meeting will be held to review the project achievement. Evaluators will be invited to join the meeting to review/evaluate the project achievements.

**Sub-activity 5.2** International workshop

The workshop will not only receive participants from member countries but also invite expert scientists as keynote speakers to facilitate to spread and exchange brand-new information on food safety between SEAFDEC and various institutions.

**Activity 6:** Coordination by the project leader

The project leader will coordinate and encourage the research activities and also facilitate information exchange not only domestically but also among member countries so that the present project under TF-5 will promote food safety of aquaculture products in Southeast Asia.

**3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2014**

**3.1 Activities Achievements in the Year 2014**

Achievements based on Activities	Duration	Remarks
1. Withdrawal periods of antibiotics in some aquatic species cultured in the tropics - Experiments on withdrawal periods of oxytetracycline (OTC) and oxolinic acid (OXA) on aquatic species cultured in the tropics was continued. Among high-valued species such as sea bass, giant freshwater prawn, pompano, one species will be selected after the availability is confirmed as the target species. A general review on the withdrawal period of antibiotics including the species done by other researchers as well as those analysed in the previous years in this project will be done.	Jan-Dec	
2. Surveillance of chemical contaminants in aquaculture products and feeds - Surveillance of the presence of OXA and OTC in shrimp and fish using micro-organisms was done in the Philippines and if budget permits, this will also be done in selected Southeast Asian countries.	Jan-Sept	
3. Guidelines on appropriate administration and regulation of antibiotics/other chemicals - The document providing Guidelines for antibiotics/chemicals usage and regulations has been drafted and is being finalized for use of the SEAFDEC member countries. Information in the Guidelines will fill gaps of the ASEAN guidelines on chemical use.	Apr-Oct	SEAFDEC Guidelines will complement the ASEAN guidelines .

**3.2 Evaluation of the Project Outcomes Till the Year 2014**

**3.2.1 Theme/Program Thrust and Issues:**

<b>(1) Theme/Program Thrust:</b> Food safety of aquaculture products in Southeast Asia
<b>(2) Issues in the region at the beginning of the study:</b> The use of antibiotics and other chemicals in aquaculture is widely practiced to help meet the increasing demand for aquaculture food. These antibiotics and chemicals detected in aquaculture products appear to derive from material inputs during rearing, mostly from contaminated feed ingredients and therapeutants for prevention or treatment of diseases. Thus, cultured shrimps and fish in various stages from hatcheries to grow-out ponds are exposed to chemical contamination. On the other hand, with the ever-growing and worldwide concern for food safety, fish farmers are faced with the challenge of producing safe food from farm to folk. There are very limited data available on the withdrawal period of antibiotics and the presence of chemical residues in aquaculture products from the region. Considering the growing-awareness on issues of food safety

of aquaculture products, it is an urgent matter that SEAFDEC should take the lead in establishing regional guidelines on the right usage of antibiotics and other chemical inputs that will allow farmers to increase production of safe food using the environment-friendly technologies.

### 3.2.2 Expected Final Goal of the Project:

- To contribute in the establishment of guidelines on the production of safe aquaculture products from Southeast Asia
- To determine the presence and levels of commonly used chemicals in aquaculture in aquaculture products such as fish and shrimps
- To compile and disseminate SEAFDEC guidelines on the use of antibiotics and chemicals in aquaculture to the ASEAN region
- To implement training course/workshop to promote food safety awareness in the ASEAN region

### 3.2.3 “Steps” Toward Achieving Final Goal:

#### Step 1:

- Literature survey & method validation
- Acquisition of reagents, sample collection in Philippines and analysis of samples
- Surveillance of antibiotics/chemicals usage
- Preparation of training course/international seminar

#### Step 2:

- Administration trial & analysis
- Sample collection in other countries and analysis of samples
- Continued surveillance of antibiotics/chemicals usage
- Training course

#### Step 3:

- Evaluation of the mechanism of accumulation and withdrawal of antibiotics and formulation of guidelines on drug administration for responsible aquaculture
- Continued sample analyses and preparation/submission of reports
- Update of baseline data
- International workshop/publication

### 3.2.4 Activities in the Current Project:

**(1) Current position of the project:** Step 3

**(2) Program duration:** 2010-2014

**(3) Main activities:**

- Withdrawal period of antibiotics in important cultured fishes in the Southeast Asian region
- Surveillance of chemical contaminants in aquaculture products and feeds
- Guidelines on appropriate administration and regulation of antibiotics/other chemicals
- Training course/workshop

### 3.2.5 Progress and Achievements of the Current Project:

**(1) Main activities conducted in the current project**

- To establish guidelines on the proper usage of antibiotics and chemicals for farmers
- To survey and monitor the chemical contaminants in aquaculture products and feeds especially in developing ASEAN member countries
- To compile guidelines on appropriate administration and regulation of antibiotics/other chemicals
- To implement of training course/workshop

**(2) Main achievements till the end of 2014 (tentative)**

- The micro-organism method of Oxytetracycline (OTC) and oxolinic acid (OXA) detection were developed, and its sensitivity was determined, instead of high performance liquid chromatography (HPLC) method, which requires equipment that is not affordable to small laboratories and skilled chemists/technicians are needed to do the analysis.
- Guidelines for antibiotics/chemicals usage and regulations were finalized for use of the SEAFDEC member countries. It is expected that information here will fill the gaps of the ASEAN guidelines.

<b>(3) Outcomes/Outputs during the project period and expected achievement rate till the end of 2014 (tentative)</b>	
<b>Expected outcomes/outputs</b>	<b>Achievement rate (%)</b>
- To contribute in the establishment of guidelines on the production of safe aquaculture products from Southeast Asia	80%
- To determine the presence and levels of commonly used chemicals in aquaculture in aquaculture products such as fish and shrimps	80%
- To compile and disseminate SEAFDEC guidelines on the use of antibiotics and chemicals in aquaculture to the ASEAN region	90%
- To implement training course/workshop to promote food safety awareness in the ASEAN region	100%

### 3.2.6 Evaluation of Project Activities in 2014:

#### **II. Surveillance of chemical contaminants in aquaculture products and feeds**

- The study has developed a micro-organism method of OTC and OXA detection, an alternative method of antibiotic detection which is cost effective and sensitive.
- Results obtained from the study indicate the possibility of using micro-organisms in detecting OXA and OTC in samples.

#### **III. Establishment of guidelines for the appropriate administration and regulation of chemical use and technology extension**

- Another important accomplishment under the Project was the crafting of the SEAFDEC Guidelines for antibiotics/chemicals usage and regulations which is expected to complement the approved ASEAN guidelines on chemical use. SEAFDEC Guidelines shall include the detailed recommendations for antibiotics/chemical usage which are not included in the ASEAN guidelines as well as recent results from SEAFDEC AQD on withdrawal periods for antibiotics and other information resulting from studies on antibiotic and pesticide residues in feed ingredients so that a more comprehensive guideline can be realized. In addition, emerging chemicals that recently aroused concern among various ASEAN countries such as ethoxyquin and melamine shall be included.

##### **Draft Outline of SEAFDEC Guidelines**

1. Background and introduction (draft by Coloso): includes historical accounts on Expert meeting on use of chemicals in aquaculture in 1996; also drafting of the ASEAN Guidelines on Chemical use in aquaculture and measures to eliminate the use of harmful chemicals.
2. Antibiotic and pesticide residues in aquaculture products (draft by Catacutan): includes results of survey in three regions of Philippines only and recommendations.
3. Withdrawal periods of antibiotics in fish species cultured in the tropics (draft by Arnaiz): includes results of studies on withdrawal periods of antibiotics in shrimp, milkfish, hybrid red tilapia, mangrove red snapper, orange-spotted grouper and recommendations.
4. Ethoxyquin (draft by Arnaiz): includes literature studies on ethoxyquin and recommendations to limit residues in feeds and aquaculture products to conform with standards.
5. Organotin compounds (draft by Coloso): includes literature and SEAFDEC studies on organotins and alternatives to the use of organotins in bw ponds to eliminate the use of organotins in aquaculture.
6. Melamine (draft by Coloso) : includes literature studies on melamine and recommendations to eliminate the use of melamine in aquaculture.
7. Overall summary and recommendations.
8. Acknowledgements, References, and Annexes.

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 01201204
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI GCP/RAS/269/GFF)		
<b>Program Thrust:</b>	III	<b>Total Duration:</b>	4 years (2012 to 2015)
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	
<b>Donor/Sponsor:</b>	GEF	<b>Total Donor Budget:</b>	USD 3,000,000
<b>Project Partner:</b>	FAO	<b>Budget for 2015:</b>	USD ~200,000
<b>Project leader:</b>	Dr. Chumnarn Pongsri (Steering Committee Member of Regional Facilitation Unit (RFU) of REBYC-II CTI)		

## 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 partner, The Southeast Asian Fisheries Development Center (SEAFDEC), based in Thailand, and the governments of the participating countries Indonesia, Papua New Guinea, Philippines, Thailand and VietNam, 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) The 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 Expected Outcomes

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).

#### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Trawl fishery policy and management reforms based on the APFIC Trawl Fisheries Guidelines And Ecosystem approach to fisheries management (EAFM)	Project management and planning and adopted national work plans for 2014-2015 and potential strategies for the project implementation for the remaining project period.	<b>Activity 1:</b> Provision of technical and administrative support to the REBYC-II CTI partner countries.	1. Countries Project Country project progress reports 2. New TOA and LOA 3. Consultant TOR 4. BTO reports from field visits
		<b>Activity 2:</b> Facilitation of the 2 <sup>nd</sup> Project Steering Committee Meeting	Prospectus & progress report Report from 2 <sup>nd</sup> PSCM
		<b>Activity 3:</b> Support to the organization of the Mid-Term Evaluation (MTE)	Records of liaison between SEAFDEC RFU and FAO MTE team.
	Human resource capacity in the participating countries for the sustainable management of their coastal fisheries, including trawl fisheries.	<b>Activity 4:</b> Convening four (4) Regional Workshops 1. Practical Workshop on Ecosystem Approaches for Fisheries Management 2. Project Monitoring and Evaluation 3. Practical workshop on Development of 2015 Workplan 4. Unspecified topic	1. Workshop materials and reports on 1.1. Practical Workshop on Ecosystem Approaches for Fisheries Management 1.2. Project Monitoring and Evaluation 1.3. Unspecified topic (National Workshop on participatory approaches and socio-economic and

Outcomes	Outputs	Activity	Key Performance Indicators
		(National Workshop on participatory approaches and socio-economic and gender mainstreaming of Vietnam and/or Indonesia)	gender mainstreaming of Vietnam and/or Indonesia) 2. Year 2015 Country Work plans
		<b>Activity 5:</b> Drafting of three (3) working papers: 1. Regional overview of policy and legal framework for trawl fisheries. 2. Regional trawl bycatch policy/strategy. 3. Economic incentives in Southeast Asian trawl fisheries	Draft working papers
		<b>Activity 6:</b> Training and capacity building on 1. Essential Ecosystem Approaches for Fisheries Management and Training of Trainer 2. Mapping Fisheries Resources through GIS 3. Socio economic surveys and trawl bycatch information collection. 4. Project Monitoring and Evaluation	Training Course materials Training course reports.
	Coordination among trawl fisheries stakeholder through awareness and knowledge building on trawl fisheries bycatch management and their related to sustainability in trawl fisheries	<b>Activity 7:</b> Engagement with Government, NGOs and private sector organizations	Minutes of roundtable meetings
		<b>Activity 8:</b> Maintenance of the Project website and development of communication materials.	Website operational

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1) Provision of technical and administrative support to the REBYC-II CTI partner countries.	This will continue to be 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 packaged for Project use and for dissemination to third parties. Where necessary, SEAFDEC RFU staff will carry out visits to the various national project sites.
2) Convening four (4) Regional Workshops 1. Practical Workshop on	Regional Workshops (4) These will include; 1. Ecosystem Approach to Fisheries management will promote the EAFM approach being championed by FAO/BOBLME to key

Activity	Description
<p>Ecosystem Approaches for Fisheries Management</p> <p>2. Project Monitoring and Evaluation</p> <p>3. Practical workshop on Development of 2015 Workplans</p> <p>4. Unspecified topic (National Workshop on participatory approaches and socio-economic and gender mainstreaming of Vietnam and/or Indonesia )</p>	<p>trainers and technical staff in SEAFDEC’s regional centres.</p> <p>2. Trawl Fisheries Economic Incentives Workshop will explore the issue of incentives, (both constructive and perverse), in the partner countries’ trawl fisheries, with a view to developing recommendations for their use or otherwise. The findings from this workshop will contribute to 3.c. below.</p> <p>3. Year 2015 Workplan Development Workshop. This workshop will develop and agree work plans for 2015, in the five countries, drawing on experiences and lessons learned through current implementation. It will be timed to coincide with the Project MTE, currently planned for February 2014.</p> <p>4. An unspecified workshop. Planning for this is thought necessary to allow the SEAFDEC RFU some flexibility within its workshop program.</p>
<p>3) Drafting of three (3) working papers:</p> <p>1. Regional overview of policy and legal framework for trawl fisheries.</p> <p>2. Regional trawl bycatch policy/strategy.</p> <p>3. Economic incentives in Southeast Asian trawl fisheries</p>	<p>Drafting of Working Papers (3)<sup>1</sup> These will include;</p> <p>1. A regional overview of policy and legal framework for trawl fisheries will consolidate and collate the national reviews carried out by the 5 country partners, as well as consider findings from the APFIC trawl guidance workshop (Sept 2013).</p> <p>2. A draft regional Trawl bycatch policy/strategy will be a consolidation of the 5 country national or provincial/local bycatch policies and strategies induced through the projects activities. It will also draw on the findings from the APFIC trawl guidance workshop</p> <p>3. A study of economic incentives used in Southeast Asian Trawl fisheries will draw on the findings from the workshop (2.b above), highlighting both positive and negative practices and recommendations for their use and non use.</p>
<p>4) Facilitation of the 2<sup>nd</sup> Project Steering Committee Meeting</p>	<p>The SEAFDEC RFU will work with partner organisations in the host country, to facilitate the <i>Second Project Steering Committee (PSC) Meeting</i>. The RFU will be responsible for all documentation relating to the event. This event may be combined with a regional workshop to save participant travel costs.</p>
<p>5) Support to the organization of the Mid-Term Evaluation (MTE)</p>	<p>SEAFDEC RFU will not be responsible for this event but will play an important supporting role, in terms of arranging logistics etc. As with 4. above, this event may be combined with a regional workshop, (most likely to be the 2014-15 Workplan Workshop, to save participant travel costs</p>
<p>6) Maintenance of the Project website and development of communication materials.</p>	<p>SEAFDEC will continue to develop and maintain the project website on which relevant information will be regularly published, including project documents, reports, tool kits/methodologies and news items. This will include some reorganisation of the site to streamline access to information on the site.</p>
<p>7) Training and capacity building on</p> <p>1. Essential Ecosystem Approaches for Fisheries Management and Training of Trainer</p> <p>2. Mapping Fisheries Resources through GIS</p> <p>3. Socio economic surveys and trawl bycatch information collection.</p> <p>4. Project Monitoring and Evaluation</p>	<p>SEAFDEC will provide training on four topics, (including those identified through the TNA conducted during the 1st LOA). These trainings may be combined with other regional meetings/workshops to reduce travel costs.</p> <p>1. Training in the Ecosystem Approach to Fisheries Management. This course, based on the Essential EAFM Handbook will be delivered by SEAFDEC to key trainers in one of the participating countries shared with BOBLME.</p> <p>2. Mapping Fisheries Resources through GIS. The spatial representation of data is a powerful tool and is of considerable interest to several of the partner organisations who, currently lack capacity to use GIS for effective planning purposes. PNG, Indonesia, and Philippines have all indicated an interest in receiving training in this topic.</p>

<sup>1</sup> The RFU PRC, and LTO, supported by other FAO and SEAFDEC technical experts will take the lead in drafting these documents

Activity	Description
	<p>3. Socio economic surveys and trawl bycatch data collection. This course will combine topic requests identified by the Training Needs Assessment (TNA) carried out under the first LOA.</p> <p>4. Project Monitoring and Evaluation. Under the TNA, Thailand, Vietnam and Philippines requested support on Project M&amp;E as a medium level priority. This training will provide an opportunity for all countries to look at how they are monitoring and evaluating their country REBYC-II CTI programs.</p>
8) Engagement with Government, NGOs and private sector organizations	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 organizations.

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

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

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	53,700	20,700	xxxx	xxxx	xxxx
Activity 2: Convening four (4) Regional Workshops	Sub-activity 2.1: Practical Workshop on Ecosystem Approaches for Fisheries Management	52,000*	21,000	xxxx	xxxx	xxxx
	Sub-activity 2.2: Project Monitoring and Evaluation		21,000			
	Sub-activity 2.3: Practical workshop on Development of 2015 Workplans	-	22,000			
	Sub-activity 2.4: Unspecified topic (National Workshop on participatory approaches and socio-economic and gender mainstreaming of Vietnam and/or Indonesia)	-	22,000			
Activity 3: Drafting of three (3) working papers:	Sub-activity 3.1: Regional overview of policy and legal framework for trawl fisheries.	-	-	xxxx	xxxx	xxxx
	Sub-activity 3.2: Regional trawl bycatch policy/strategy.	-	-	xxxx	xxxx	xxxx



Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
	Sub-activity 3.3: Economic incentives in Southeast Asian trawl fisheries	-	-	xxxx	xxxx	xxxx
Activity 4 Facilitation of the 2 <sup>nd</sup> Project Steering Committee Meeting		17,500	13,000			
Activity 5 Support to the organisation of the Mid-Term Evaluation (MTE)		-	-			
Activity 6 Maintenance of the Project website and development of communication materials.		8,000	8,400			
Activity 7 Training and capacity building on	1. Essential Ecosystem Approaches for Fisheries Management and Training of Trainer	37,000*	16,000	xxxxxx	xxxxxx	xxxxxx
	2. Mapping Fisheries Resources through GIS	-	16,000	xxxxxx	xxxxxx	xxxxxx
	3. Socio economic surveys and trawl bycatch information collection.	-	16,000	xxxxxx	xxxxxx	xxxxxx
	4. Project Monitoring and Evaluation	-	16,000	xxxxxx	xxxxxx	xxxxxx
Activity 8 Engagement with Government, NGOs and private sector organizations		-	-	xxxxxx	xxxxxx	xxxxxx
	<b>Sub-Total</b>	<b>168,200</b>	<b>190,600</b>	<b>xxxxxx</b>	<b>xxxxxx</b>	<b>xxxxxx</b>

\* Activities in year 2013 and 2014 are different in number and topics of activities.

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

LOA for REBYC-II CTI in year 2015 is under formulating. Activities will be update in January 2016.

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

#### 5.1 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 (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1</b> Provision of technical and administrative support to the REBYC-II CTI partner countries.	VI				Will be update
<b>Activity 2</b> Convening four (4) Regional Workshops					
1. Practical Workshop on Ecosystem Approaches for Fisheries Management	IV	14	4	3	14578.92
2. Workshop on Economic Drivers And Incentives In Trawl Fisheries	IV	10	2	4	20,913.12
3. Regional Workshop On REBYC-II CTI Work Planning: 2014 – 2015 and Workshop on FAO Administrative Systems and Financial Operations	IV	16	1	0	16629.50
4. Unspecified topic (Support National Workshop on participatory approaches and socio-economic and gender mainstreaming of Vietnam and/or Indonesia)	IV				On-going workshop will be finalized on November 2014
<b>Activity 3</b> Drafting of three (3) working papers:					
1. Regional overview of policy and legal framework for trawl fisheries.	I. R&D			1	On-going
2. Regional trawl bycatch policy/ strategy.	I. R&D			1	On-going
3. Economic incentives in Southeast Asian trawl fisheries	I. R&D			1	On-going
<b>Activity 4</b> Facilitation of the 2nd Project Steering Committee Meeting	IV. Policy Development				11,901.15
<b>Activity 5</b> Support to the organization of the Mid-Term Evaluation (MTE)	VI. Others		2	7	Drafted report is under editing by FAO
<b>Activity 6</b> Maintenance of the Project website and development of communication materials.	VI. Others				On going
<b>Activity 7</b> Training and capacity building on					Will be update
1. Essential Ecosystem Approaches for Fisheries Management and Training to Trainer	II. Training	4	20	3	17767.10
2. Mapping Fisheries Resources through GIS	II. Training	27	0	0	22,200.00
3. Socio economic surveys and trawl bycatch information collection.	II. Training				Conducting in November 2014
4. Regional Training on Project Planning, Monitoring & Evaluation	II. Training	16	7	0	19,784.10
<b>Activity 8</b> Engagement with Government, NGOs and private sector organizations	IV. Policy Development				Will be update

## 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Output 1: Project management and planning and adopted national work plans for 2014-2015 and potential strategies for the project implementation for the remaining project period.	1. New Letter of Agreement and Term of Agreement	LOA and TOA of REBYC-II CTI of Participating Countries, Philippines and Indonesia are approved by FAO. Ongoing process on LOA and TOA of PNG Thailand and Vietnam	
	2. Report from 2 <sup>nd</sup> PSCM 3. Records of liaison between SEAFDEC RFU and FAO MTE team.	Participating Countries Recommendation of Midterm Evaluation will guide to all REBYC-II CTI Stakeholders for adapt the project details to archive with project objective (See Midterm Evaluation Report)	
Output 2: Human resource capacity in the participating countries for the sustainable management of their coastal fisheries, including trawl fisheries.	4. Workshop materials and reports 5. Draft Country Work plan in Year 2015	REBYC-II CTI Participating Countries is 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)	
Output 3: Coordination among trawl fisheries stakeholder through awareness and knowledge building on trawl fisheries bycatch management and their related to	6. Minutes of roundtable meetings 7. Website operational	Will be update in December 2014	

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	attached e-file
1. Training manual on Essential Ecosystem Approaches for Fisheries Management (EAFM)	Hardcopy, VDO and electronic	
2. Training reports on EAFM	Hardcopy	
3. Steering Committee Meeting Report	Hardcopy	
4. Project Planning and Evaluation	VDO	
5. Country Workplan year 2015 enclosed with Steering Committee Meeting Report	Hardcopy	
6. Country reports trawl fisheries of REBYC-II CTI participating countries		Website REBYC-II CTI

## 5.3 Project Outcomes and Lesson Learned

<ol style="list-style-type: none"> <li>1. The participating countries have different background of trawl fisheries</li> <li>2. The countries have different interests to develop management</li> <li>3. Establishment of stakeholders of trawl fisheries should be clearly identified and prioritized</li> <li>4. Data collection is one the major challenges, Hindrances are different in each countries</li> <li>5. Gear modifications are important but they are not always the most appropriate tool.</li> <li>6. MCS are required, however, the requirements are different between the countries</li> <li>7. Scientific information from one country should be shared with other countries</li> <li>8. Socio-economic study and research on the incentives for fishers to comply with measures</li> </ol>
--

9. Ecosystem Approach to Fisheries Management (EAFM) is possible to apply to trawl fisheries management however there are different in details from EAFM for coastal or small scale
10. Collaboration and supported by FAO and organizations *e.g.* APFIC, SIDA BOBLME and SEAFDEC is significant strength to reach the project outcome

#### 5.4 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.

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 IV: EVALUATION

#### 6. Project Evaluation

Refer to Mid-term Evaluation Report conducted by FAO evaluators, there are 11 recommendations

1. Enhance quality control in the preparation of project documents with a view to having them reviewed in-depth beyond Programme and Project review Committee requirements, before becoming a management instrument, with the emphasis given to consistency and logic in the Results Framework in line with RBM principles.
2. Ensure that funding for core functions in a project are ensured before initiating activities.
3. Undertake a budget revision to secure funding for full-time services of the Project Regional Coordinator (PRC) to the project for the remainder of its duration, and allocate sufficient funds for increased travel by the PRC to the countries and for capacity strengthening activities in them.
4. Ensure that BH functions are adequately resourced with time, cost-recovery mechanisms and the funds available from the project's GEF agency fee, which could be used to support a project assistant. FAO-RAP is also urged to recruit such a project assistant to be based in FAO-RAP and with full access to FAO systems.
5. Continue to provide technical support and backstopping to the project, or the necessary resources for it, to ensure that momentum in implementation is maintained and that the main outputs are achieved by the project's end.
6. Furnish in-depth and longer-term technical training and facilitation of stakeholder engagement at site-level to the stakeholders for EAFM-based management plan development in order to better ensure that the plans are of quality, inclusive of all parties and shared at national level as a model for other sites.
7. The project should urgently assess in-depth to what extent socio-economic, including gender, data-gathering has been initiated in each of the countries, and take action to ensure that adequate and relevant data is gathered and analysed to understand the potential impacts of bycatch reduction on different groups, and incorporate in fisheries management planning.
8. Explore the possibility of having the project's partner organizations, *e.g.* regional/international NGOs, regional initiatives and industry organizations, adopt outputs of the project, or parts of them, suited to these partners, to enable the project to focus on its areas of strength.
9. Review the priorities proposed by the MTE, base the work planning for the remaining project period on these, and seek PSC endorsement of a strictly prioritised work plan
10. In consultation with FIRO and the RFU, extend the project up to the end of 2015 (by 3 months) to allow for the completion of crucial activities.

11. Initiate as early as possible and in consultation with the RFU, FAORAP and PSC, the formulation of a follow-up project with the aim of synthesizing the results from REBYC and REBYC-II CTI and implementing the fisheries management plans and the institutional and legal changes proposed.  
(More details available in Midterm evaluation Report and project Steering Committee Meeting Report )

Table 8 Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	Refer to Training Need Assessment (TNA) and Mid-term Evaluation, it can be considered that the role of Regional facilitation Unit (RFU) could successfully in facilitation the development of human capacity of requested subjects in order to support management of fisheries in the project participating countries.	100
<i>How well did the Results contribute to the Achievement of the project purpose/ objectives?</i>	“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 Asia 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 Philippine. Activities were conducted from year 2013 to 2014 was emphasized to develop better approached in all ecological, human, and intuitional and legal component.	100
<i>Which has benefited on society and sector?</i>	Participating Countries, Indonesia, Philippines, Papua new Guinea, Thailand and Vietnam, will have effective trawl fisheries management in pilot site(s). Trawl management plan what trialed in each participating Countries are possible to expand to nationwide for sustainable use of fisheries resources.	100
<i>Have products and benefits been maintained?</i>	Regarding to the Ecosystem Approach to Fisheries Management, Evaluation on the management performance will be assessed through appropriated indicator. Trawl fisheries management is short term and long term reviewed and adapted in regarding to fisheries status and trend. Benefits of project will be maintained through the adaptive management concept.	100

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 01201305			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of Countermeasures to Reduce IUU Fishing Activities		
<b>Program Thrust:</b>	III	<b>Total Duration:</b>	2013 - 2017
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	Malaysia
<b>Donor/Sponsor:</b>	JTF-6	<b>Total Donor Budget:</b>	USD 200,700
<b>Project Partner:</b>	Kongpathai and team	<b>Budget for 2015:</b>	USD 35,800
<b>Project leader:</b>	Bundit Chokesanguan		

## **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. She recognizes fishing management schemes such as fishing license, boats registration and etc. as effective measures to promote the sustainable use and the long-term conservation of marine living resources. Following the direction of Resolution and Plan of Action, the SEAFDEC Training Department (TD) has been implemented the project of “Promotion of Countermeasures to reduce IUU Fishing”, aim to collaboration with Member Countries to reduce IUU fishing in the region. The main activities are; 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 implemented the project of “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 Expected Outcomes

- Coordination, cooperation and application of countermeasure to reduce IUU fishing activities by Member Countries.

#### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
<b>Outcome 1:</b> coordination, cooperation and application of countermeasure to reduce IUU fishing activities by Member Countries	Output 1: Regional Fishing Vessel Record database in the region	Activity 1: Promotion and development of the regional fishing vessels record (RFVR)	<ul style="list-style-type: none"> <li>- Agreed of Member Countries to share basic information requirement of RFVR database</li> <li>- Information movement and update for RFVR database</li> <li>- Utilization of RFVR database</li> </ul>
	Output 2: Member 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	<ul style="list-style-type: none"> <li>- Recommendation of Strengthening of PSM and other surveillance measures in the region</li> <li>- Awareness understanding of PSM and other surveillance measures in the region (At least 50% of trainee who attend in training course understand more after training)</li> </ul>
		Activity 3: Production of information materials	<ul style="list-style-type: none"> <li>- Awareness publication, news related to the results from projects</li> </ul>

#### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1) Promotion of Regional Fishing Vessels Record (RFVR)	<p>Sub-activity 1.1: Development and management of RFVR Database</p> <p>Follow up the approval of the Regional Fishing Vessels Record (RFVR) activity by the SEAFDEC Council at its 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 use as tool to combat IUU fishing in the region.</p> <p>Sub-activity 1.2: Technical workshop on RFVR database development and management</p> <p>The technical workshop will be organized. The selected/nominated person who are involved in/and responsible for this activity. The selected relevant Member Country will be invited to participate in the workshop/TD staffs who conduct in this database will visit each country to discuss and consult for development and management on database of RFVR of 24 meters in length and over.</p> <p>Sub-activity 1.3: Technical assistant on using of RFVR Database</p> <p>The technical assistance on using of RFVR database 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 strengthen of PSMs and other surveillance measures to reduce IUU fishing in collaboration with SEAFDEC Member Countries.</p>

Activity	Description
2) Strengthening of Port State Measures and other surveillance measures in the region	<p>Sub-activity 2.1: Providing technical assistant on PSMs facilities and existing mechanism in SEAFDEC Member Countries</p> <p>The technical assistance on PSMs facilities and existing mechanism in SEAFDEC Member Countries will be conducted. The output information will be used to prepare and organize on-site training and workshop on strengthen of PSMs and other surveillance measures to reduce IUU fishing in collaboration with SEAFDEC Member Countries.</p> <p>Sub-activity 2.2: On-site training and workshop on strengthen of PSMs and other surveillance measures to reduce IUU fishing in the region</p> <p>The on-site training and workshop on strengthen of PSMs activities and other surveillance measures to reduce IUU fishing will be organized in collaboration with member countries. Government agencies, stakeholders and other sectors concerned will be invited to attend in this activity. The course subject will provide on understand of PSM agreement and how to implement/improvement PSM and related activities. Basic understanding on PSM and other surveillance measures will be impart to Member Countries as capacity building to prepare for PSM activities in their country</p>
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.

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

Table 3 Proposed Budget based on activity and sub-activity 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	20,000		
	Sub-activity 1.3: Technical assistant on using of RFVR Database				17,000	17,000
Activity 2: Strengthening of Port State Measures and other surveillance measures in the region	Sub-activity 2.1: Providing technical assistant on PSMs facilities and existing mechanism in SEAFDEC Member Countries	23,000	9,000		9,000	9,000
	Sub-activity 2.2: On-site training and workshop on strengthen of PSMs and other surveillance measures to reduce IUU fishing in the region		10,400	24,000	10,400	10,400
Activity 3 Production of information materials		2,000	500	1,000	500	500
	Sub-Total	45,000	36,900	45,000	36,900	36,900



## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs <sup>1</sup>	Type of Activity	Proposed Budget
Sub-Activity 1.1: Monitoring and updating of RFVR database 24 meters in length and over	Jan.-Dec.	- Update of information - Statistic of using the database	VI. Others	
Sub-Activity 1.2: Regional consultation on RFVR database less than 24 meters development and management	Jul.	- Resource persons/ expert on relevant subject - Information relevant for subject	IV. Policy development activities	20,000
Sub-Activity 2.1: On-site training and workshop on strengthen of PSMs and other surveillance measures to reduce IUU fishing in the region	Apr., Sep.	- Resource persons/ expert on relevant subject	II. Training activities	24,000
Sub-Activity 3.1: Production of information materials	Jan-Dec	- Results from the project - Events for dissemination the results	III. Information activities	1,000

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

- The RFVR database of vessel 24 meters in length and over was develop in coordination and cooperation with SEAFDEC Member Countries concerned namely; Brunei Darussalam, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam as a tool to combat IUU fishing.
- The Technical Workshop on Regional Fishing Vessel Record (RFVR) Database Development and Management in Southeast Asia was organized from 20 to 21 August 2014 in Pattaya, Chonburi Province, Thailand. The Workshop came up with policy recommendations and the way forward for the implementation of RFVR database, as well as an agreement for the participating countries to provide addition information required in effectively enhancing the RFVR database such as vessel registration number, vessel owner, and IMO number.
- Awareness understand on strengthen of PSM and other surveillance measures to reduce IUU fishing via on-site training in Malaysia and Myanmar
- Production and dissemination of report of The Technical Workshop on Regional Fishing Vessel Record (RFVR) Database Development and Management in Southeast Asia to Member Countries and public.

#### 5.1 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 (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1</b>					
1. Development and management of RFVR Database	III		2		0
2. Participation in Sub-Regional Technical Meeting of Effective Fisheries	IV		1		714.95

<sup>1</sup> The financial, human, material, technological and information resources used for development interventions

List of Actual Sub-activity (1)	Type of activity*	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
Management in Penang, Malaysia 15-13 May 2014					
3. Participation in Sub-Regional Consultative Meeting on the Collaborative Fisheries Management in Phuket, Thailand 27-28 May 2014	IV		1		535.91
4. Technical workshop on RFVR database development and management	IV	14	18		29,723.97
<b>Activity 2</b>					
1. On-site training and workshop of Offshore fisheries management and reducing IUU fishing in Malaysia 3-7 Feb 14	II	35			15,262.94
2. On-site training and workshop of Offshore fisheries management and reducing IUU fishing in Myanmar 3-7 March 14	II	40			13,210.17
<b>Activity 3</b>					
1. Production and dissemination of report of The Technical Workshop on Regional Fishing Vessel Record (RFVR) Database Development and Management in Southeast Asia	III				Will be updated

## 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Output 1: Regional Fishing Vessel Record database in the region	(A) Agreed of Member Countries to share basic information requirement RFVR database	Seven (7) concerned Member Countries agreed to share basic information requirement for RFVR database	
	(B) Information movement and update for RFVR database	RFVR database is updated in collaborative with seven concerned Member Countries	
	(C) Utilization of RFVR database		Trial phase
Output 2: Member Countries awareness building and common understanding of Port State Measure activities as a tool to reduce IUU fishing	(D) Recommendation of Strengthening of PSM and other surveillance measures in the region		Not activities in this year
	(E) Awareness understanding of PSM and other surveillance measures in the region (At least 50% of trainee who attend in training course understand more after training)	Observation from group discussion and presentation in the workshop after training, more than 50% of participant understand more when comparison with before training.	

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	Attached e-file
Report of The Technical Workshop on Regional Fishing Vessel Record (RFVR) Database Development and Management in Southeast Asia	Hardcopy and e-file	<a href="http://www.seafdec.or.th/index.php/downloads/doc_download/650-report-of-the-technical-workshop-on-regional-fishing-vessel-record-rfvr-database-development-and-management-in-southeast-asia">http://www.seafdec.or.th/index.php/downloads/doc_download/650-report-of-the-technical-workshop-on-regional-fishing-vessel-record-rfvr-database-development-and-management-in-southeast-asia</a>

### 5.3 Project Outcomes and Lesson Learned

- A part of information to combat with IUU fishing in the region
- Collaboration between Member Countries to reduce IUU fishing in the region

### 5.4 Major Impacts/Issues

- The mechanism of each Member Countries to send update of RFVR information in time
- Rule and regulation of each Member Countries to share RFVR information

## PART IV: EVALUATION

### 6. Project Evaluation

The evaluation of the project implementation from 2012 until present, the step of establishment of Regional Fishing Vessel Record (RFVR) database is success in collaboration with Member Countries, next step of evaluation is utilization of database might be evaluation in the last year of project implementation. For the activity on strengthening of Port State Measures and others surveillance measures in the region, the evaluation of follow up recommendation from workshop in 2012 is on process. The result will be complete in next year.

Table 8 Project Evaluation (for mid-term of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	Member Countries agreed and share for basic information for RFVR database as a tool to combat IUU fishing	100
<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>	Establishment of RFVR database complete and success by collaboration with Member Countries as achievement of the project purpose. However, the project plan to evaluate of RFVR database utilization as next step	100
<i>Which has benefited on society and sector?</i>	When the project terminate in 2017, Member Countries will got benefit from project activity such as information to combat IUU fishing.	
<i>Have products and benefits been maintained?</i>	The RFVR database will maintain depend on utilization and need from Member Countries by evaluation and consideration from Member Countries	

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 04201301			
<b>Program Categories:</b>	Programs under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products		
<b>Program Thrust:</b>	III	<b>Total Duration:</b>	5 years (2013-2017)
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Singapore
<b>Donor/ Sponsor:</b>	JTF 6	<b>Total Donor Budget:</b>	USD 132,712
<b>Project Partner:</b>	None	<b>Budget for 2015:</b>	USD 33,000
<b>Project Leader:</b>	Mr. Abdul Razak Latun		

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

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

Recently consumers in the world demand more information about the food they eat. Traceability of fish and fishery products and compliance with trade related measures have become key issues in the Southeast Asian region. This project deals with intra-regional and international trade in fish and fishery products from capture fisheries. This project 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) for sustainable fisheries. 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. Moreover, ASEAN CDS will increase the traceability of fish and fishery products from the region and promote intra-regional trade and international exports from the region.

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

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 (29<sup>th</sup> 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, outputs from the project such as 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.

This project corresponds to #8 of the Resolution at the ASEAN-SEAFDEC conference in 2011: Foster cooperation among ASEAN Member States 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 Expected Outcomes

- Increased cooperation among AMS in combating IUU fishing.
- AMS has increased their understanding and knowledge on the existing fishing and trading practices in small-scale fishery and impact of compliance to the EC Regulation 1005/2008 in large-scale fishery.
- Strengthen cooperation among AMS to implement international standards with regards to trading of fish and fishery products within the ASEAN region.

#### 3.2 Outputs, Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcomes 1: Increased cooperation among AMS 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.	<ul style="list-style-type: none"> <li>- At least two Core Expert Meeting reports and one Terminal Core Expert Meeting report.</li> <li>- At least 75% of AMS involve and/or participate in the Core Expert Meetings.</li> </ul>
Outcomes 2: AMS has increased their understanding and knowledge on the existing fishing and trading practices in small-scale fishery and impact of compliance to the EC Regulation 1005/2008 in large-scale fishery	Output 2: Increased the capacity of AMS to identify existing fishing and trading practices in small-scale fishery and problems in compliance with the EC Regulation 1005/2008 in large-scale fishery.	Activity 2: To study existing fishing and trading practices in small-scale fishery and problems in compliance with the EC Regulation 1005/2008 in large-scale fishery.	<ul style="list-style-type: none"> <li>- At least one progress report (s) on the Development of the Regional Policy Consideration on the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain to submit to FCG/ASSP meeting for endorsement.</li> <li>- All SEAFDEC MCs were involved in the study existing fishing and trading practices in small-scale fishery and problems in compliance with the EC Regulation 1005/2008 in large-scale fishery.</li> <li>- At least one publication on the result of the study existing fishing and trading practices in small-scale fishery and problems in compliance with the EC Regulation 1005/2008 in large-scale fishery.</li> </ul>
Outcomes 3: Strengthen cooperation among AMS to implement international standards with regards to trading of fish and fishery products within the ASEAN region.	Output 3: A possible ASEAN Catch Documentation Scheme for large- and small-scale capture fisheries to ensure only non-IUU/legal fish traded in the region.	Activity 3: Establishment and dissemination of a catch documentation scheme in the region.	<ul style="list-style-type: none"> <li>- ASEAN-SEAFDEC common position in developing an ASEAN Catch Documentation Scheme.</li> </ul>

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
Activity 1: Meetings for effective program implementation.	SEAFDEC/MFRDMD will invite experts on international trade in fish and fishery products from SEAFDEC Member Countries and SEAFDEC Secretariat, and resource persons to participate in the Core Expert Meeting. The meeting participants will identify problems associate with EC Regulation 1005/2008 in the Southeast Asian region, finalize the ASEAN guidelines for preventing IUU fishing and discuss the possible catch documentation scheme in the ASEAN region, which will facilitate international and intra-regional trade of non-IUU fish and fishery products.
Activity 2: To study existing fishing and trading practices in small-scale fishery and problems in compliance with the EC Regulation 1005/2008 in large-scale fishery.	Existing practices in small-scale fishery and problems associate with the EC Regulation 1005/2008 in the Southeast Asian region will be identified during the Core Expert Meeting and will be compiled by SEAFDEC/MFRDMD. MFRDMD will invite resource persons from Member Countries for further information and advice. MFRDMD will assist SEAFDEC Member Countries for implementation of the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain under the ASEAN framework.
Activity 3: Establishment and dissemination of a catch documentation scheme in the region.	MFRDMD will facilitate the discussion for a catch documentation scheme in the region. SEAFDEC Member Countries will suggest an agreeable catch documentation scheme, which will increase cooperation among the Member Countries.

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

Table 3: Proposed budget based on activity and sub-activity for 2013 – 2017

(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 and 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: Possible solutions to the problems		10,000	196		
Activity 3: To suggest a possible catch documentation scheme in the region.	Sub-activities 3.1: Establishment and dissemination of a catch documentation scheme in the region			200	15,712	396
<b>Total</b>		<b>33,000</b>	<b>18,000</b>	<b>33,000</b>	<b>15,712</b>	<b>33,000</b>

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Sub-activity 1.1: Core Expert Meetings	Jul – Sept.	All SEAFDEC MCs	I and IV: Fact finding and Policy development activities	32,604
Sub-activity 2.2: Possible solutions to the problems	Jan – Dec.	All SEAFDEC MCs	I: Fact finding	196
Sub-activities 3.1: Establishment and dissemination of a catch documentation scheme in the region	Jan – Dec.	All SEAFDEC MCs	I and IV: Fact finding and Policy development activities	200

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

For this year, the effort was concentrated on studying the existing fishing and trading practices in small-scale fishery and problems in compliance with the EC Regulation 1005/2008 in large-scale fishery, two technical reports will be published. The ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain was finalized at the Core Expert Meeting held in collaboration with SEAFDEC/Secretariat in Kota Kinabalu, Sabah in September. A possible ASEAN Catch Documentation Scheme will be formulated and drafted at the RTC on ASEAN Catch Documentation System in December 2014.

#### 5.1 Activities Conducted in the Current Project

Table 5 List of activity conducted including involved stakeholders and budget spent

List of Actual Sub-activity	Type of activity*	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
Sub-activity 2.1: Identification of existing mechanisms and associated problems	I		2		3,593
Sub-activity 2.2: Possible solutions to the problems (including 3 meetings organized with SEAFDEC/Secretariat)	I	10 5 1	15 10 7	6	11,741

#### 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Output 1: The ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain.	At least two Core Expert Meeting reports and one Terminal Core Expert Meeting report.	The regional guidelines were finalized at the core expert meeting in September in Kota Kinabalu, Sabah, Malaysia.  The 2013 Core Expert Meeting report was published.	
Output 2: Increased the capacity of AMS to identify existing fishing and trading practices in small-scale fishery and problems in compliance with the EC Regulation 1005/2008 in large-scale fishery.	At least one progress report (s) on the Development of the Regional Policy Consideration on the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain to submit to FCG/ASSP meeting for endorsement.	One publication on the result of the study existing fishing and trading practices in small-scale fishery and problems in compliance with the EC Regulation 1005/2008 in large-scale fishery.	
Output 3: A possible ASEAN Catch Documentation Scheme for large- and small-scale capture fisheries to ensure only non-IUU/legal fish traded in the region	ASEAN-SEAFDEC common position in developing an ASEAN Catch Documentation Scheme.	A RTC on ASEAN Catch Documentation System will be organized in December 2014.	

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	Attached e-file
Abdul-Razak L., Mazalina A., Mohd-Tamimi A.A., Katoh M. and Luke P.A. 2014. Report of the Regional Core Expert Meeting on Combating IUU Fishing in Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products: 07 – 09 October 2013, Kuala Lumpur, Malaysia. SEAFDEC/ MFRDMD/ RM / 28. 74p.	Book	
Existing Fishing and Trading Practices	Fish for the People	
Impact of compliance to the EC Regulation 1005/2008 in the small scale and large scale fisheries	Fish for the People	
Final draft of the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain (in collaboration with SEAFDEC/Sec and AMS)	PDF	

### 5.3 Project Outcomes and Lesson Learned

Project activities had increased cooperation among AMS in combating IUU fishing. AMS has increased their understanding and knowledge on the existing fishing and trading practices in small-scale fishery and the impact of compliance to the EC Regulation 1005/2008 in large-scale fishery. The readiness of AMS for international trade is in the large-scale fishery where vessel registration and gear licensing were in place whereas in the small-scale fishery, some AMS do not have vessel registration and gear licensing for smaller vessel less than 24m. The development and finalization of the ASEAN Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain involved lengthy discussions and agreement among AMS. This strengthens cooperation among AMS to implement some forms of international standards with regards to trading of fish and fishery products within and beyond the ASEAN region.



## 5.4 Major Impacts/Issues

Although shortage of the budget for the meeting and consultation was a problem for the project, collaboration with Secretariat has overcome the issue.

## PART IV: EVALUATION

### 6. Project Evaluation

Overall, the project is going on the right track towards expected goals and objectives.

Table 8 Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	View	%
<i>How were inputs and activities converted to results?</i>	All information collected was used to publish the results.	100
<i>How well did the Results contribute to the Achievement of the project purpose / objectives?</i>	All objectives achieved.	100
<i>Which has benefited on society and sector?</i>	Information on the existing fishing and trading practices in small-scale fishery and problems in compliance with the EC Regulation 1005/2008 in large-scale fishery were been used to identify existing mechanism and associated problems and to formulate possible solutions to overcome the problems.	80
<i>Have products and benefits been maintained?</i>	Yes	80

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 01200406
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Fisheries Resources Survey and Operational Plan for M.V. SEAFDEC 2		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	Since 2004
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	
<b>Donor/Sponsor:</b>	Requesting country/agency	<b>Total Donor Budget:</b>	
<b>Project Partner:</b>		<b>Budget for 2015:</b>	
<b>Project leader:</b>			

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

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

Research surveys and cruise are conducted using the M.V. SEAFDEC 2 based on the requirements of the Member Countries for establishing the status of fisheries resource stocks in their respective waters, as well as requirements of the region and other sub-regional initiatives. The outputs of the surveys include cruise report, technical information related to fisheries resource stocks, and other specific requirements. The results of the analysis of the survey outputs could be used in developing and implementing comprehensive policies for the sustainable management of fisheries resource stocks by the countries. In carrying out the abovementioned key activities, TD continues to work closely with the Member Countries and other key partners at national, sub-regional, and regional levels.

Utilization of the M.V. SEAFDEC 2 could be for three major specific areas, namely: (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 utilized for the conduct of surveys of the fisheries resources in the EEZs of the Member Countries, and implement relevant training programs onboard the vessel.

### **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 the conduct of fishery resource and oceanographic surveys as well as training in coastal ASEAN waters, along with procurement of requisite fishing gear, fishing machinery, and survey equipment. Subsequently, the construction of the M.V. SEAFDEC 2 was completed in 2003. Since 2004, research surveys on fisheries stock, exploration of fisheries resources, testing of sampling gears, fishery oceanography, and other activities related to marine capture fisheries have been conducted using the 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 the countries' respective research capabilities.

Due to increased operational costs for using the M.V. SEAFDEC 2 mainly because of increased fuel price, the 40<sup>th</sup> Meeting of SEAFDEC Council (2009) agreed that countries requesting to use the M.V. SEAFDEC 2 should be responsible for portion of the costs incurred by the vessel. Since 2010, a modified cost-sharing policy was therefore adopted so that fuel consumption of the vessel for the entire duration of the research/survey including cruising to and back to the requesting country from TD will be the responsibility of the requesting countries.

At the 45<sup>th</sup> Meeting of the Council of SEAFDEC (2013), some revisions of the Guidelines on the cost-sharing policy for the operation of the M.V. SEAFDEC 2 proposed by TD were considered so that sharing

of data collected from the cruise survey using M.V. SEAFDEC 2 should be agreed upon and finalized by the requesting country and SEAFDEC during their planning meeting which is usually convened before the cruise survey starts. The Council also recommended that such basic data should 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

- 1) Member Countries are able to conduct fisheries resource surveys (*i.e.* fishing trials and demonstration, oceanographic and hydro-acoustic surveys) in their respective jurisdictions; and
- 2) Capacity of human resources of Member Countries is enhanced during the surveys on-board the M.V. SEAFDEC 2 (*e.g.* fish preservation techniques, fish sampling and species identification) based on the request and requirements of concerned countries.

#### 3.1 Expected Outcomes

From the analyzed results of the surveys, comprehensive national fisheries policies on sustainable development and management of fisheries are developed and implemented by the respective countries.

#### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Management of shared-stock of oceanic tunas (yellow-fin, big-eyes, and skipjack) in Sulu and Sulawesi Seas is enhanced using the scientific data compiled from the cruise surveys of the M.V. SEAFDEC that complement those from land-based surveys.	Output 1: Concerned countries are able to make use of compiled and analyzed scientific data from the cruise survey of M.V. SEAFDEC2 under cost-sharing arrangement of participating countries, namely Indonesia, Malaysia, and Philippines	Activity 1: Tuna Fisheries Resources Survey in Sulu and Sulawesi Seas	<ul style="list-style-type: none"> <li>- Planning meeting among the participating countries prior to the cruise</li> <li>- Data collection format, procedures and standard for analysis of data discussed and harmonized for sharing among the participating countries (Indonesia, Malaysia, and Philippines)</li> <li>- Conduct of the cruise survey as planned</li> </ul>

#### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
<b>Activity 1</b> Tuna Fisheries Resources Survey in Sulu and Sulawesi Seas	<p>The overall goal of the program is to compile updated scientific findings on the status and trends of yellow-fin, big-eye, and skipjack tunas in the Sulu-Sulawesi Seas, that the countries can make use of in their respective efforts to sustainably manage and exploit these resources for the benefit of the whole Southeast Asian region.</p> <p>Specific objectives of this program are to:</p> <ul style="list-style-type: none"> <li>- Ensure strengthened collaboration among the three countries surrounding the Sulu-Sulawesi Seas, by conducting: <ul style="list-style-type: none"> <li>• Study on the use of FADs in the Sulu and Sulawesi Seas;</li> <li>• Assessment of the status and trends of tuna stocks and estimate maximum sustainable yield; and</li> <li>• Activities to raise the awareness of stakeholders on sustainable exploitation and management of tuna.</li> </ul> </li> </ul>

	<p>The M.V. SEAFDEC 2 would be utilized for the conduct of the collaborative tuna resources and oceanographic surveys within the jurisdiction of Malaysia, Philippines and Indonesia in the Sulu-Sulawesi Seas. The scope of the survey shall include the following:</p> <ul style="list-style-type: none"> <li>- Research on tuna early life history using fish larvae sampling net and Bongo net in the near shore and off shore of the Sulu and Sulawesi Seas, in order to determine the relative abundance and species composition of the fish larvae;</li> <li>- Oceanographic survey using the Integrated Conductivity-Temperature and Depth (ICTD) attached with other sensors, namely: pH, DO, Fluorescence, among others;</li> <li>- Use of scientific hydro-acoustic during the track survey; and</li> <li>- Scanning sonar survey on the FADs, and fish sampling by specific sampling gears for echo verification (if appropriate, <i>e.g.</i> data collection by hook and line/hand lines and long-line).</li> </ul>
--	--

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

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1: Tuna Fisheries Resources Survey in Sulu and Sulawesi Seas		Cost-sharing basis				

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015:

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Activity 1	17 October to 8 December 2014	<ol style="list-style-type: none"> <li>1. SEAFDEC MCR budget</li> <li>2. Technical staff of the Capture Fishery Technology Division of the Training Department</li> <li>3. National coordinators for arrangement of the cruise survey of M.V. SEAFDEC 2</li> </ol>	V	Cost-sharing basis

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

Cruise survey of M.V. SEAFDEC2 was conducted in collaboration with the participating countries.

#### 5.1 Activities Conducted in the Current Project

Table 5 List of activity conducted including involved stakeholders and budget spent

Activity	Type of activity	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
Activity 1					
Tuna Fisheries Resources Survey in Sulu and Sulawesi Seas	V	10			

## 5.2 Output(s)

Table 6 Logframe of the Output-Monitoring

Output	Key Performance Indicators	Achievement based on indicator in Year 2014	Remarks
Output 1: Concerned countries are able to make use of compiled and analyzed scientific data from the cruise survey of M.V. SEAFDEC 2 under cost-sharing arrangement of participating countries, namely Indonesia, Malaysia, and Philippines	<ul style="list-style-type: none"> <li>- Planning meeting among the participating countries conducted prior to the cruise</li> <li>- Data collection format, procedures and standard for analysis of data discussed and harmonized for further sharing among the participating countries (Indonesia, Malaysia, and Philippines)</li> <li>- Conduct of the cruise survey as planned</li> </ul>	Cruise survey using the M.V. SEAFDEC2 in Sulu and Sulawesi Seas conducted during 17 October to 8 December 2014.	

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	attached e-file
Standard operation procedure for data collection onboard M.V. SEAFDEC 2 for tuna resource survey	Template for data collection	

## 5.3 Project Outcomes and Lesson Learned

Active participation of researchers and technical officers of the participating countries (Indonesia, Malaysia, and Philippines) under their own budget, in the meetings to plan, draft the SOPs for data collection, management of data sampling, analysis and reporting. This sub-regional initiative serves as a good start of multilateral arrangement for conducting collaborative programs for improved management of fisheries resources in the respective countries. The developed SOPs are used and applied for similar studies in other sub-regional waters/areas.

## 5.4 Major Impacts/Issues

The oceanic tuna resources in the sub-regional area of Sulu and Sulawesi Seas is sustainably managed by making use of the compiled and analyzed results from the cruise survey using the M.V. SEAFDEC 2 in Sulu and Sulawesi Seas that complement the data collected on land.

## PART IV: EVALUATION

### 6. Project Evaluation

Participating countries of the program, namely Indonesia, Philippines, and Malaysia actively participate in the series of activities that include planning, drafting the survey methods, and others. Results from the survey will be compiled and analyzed to complement with the data collected from land-based survey. Final report of the preliminary results will be produced and shared among the concerned countries. Sampling methodologies including SOPs for data collection can be used as regional reference for similar initiatives in other sub- or regional waters that would be implemented in the future.

Table 8 Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	Active participation of participating countries resulted in smooth implementation of the activities (planning meeting, drafting SOPs, etc.).	100
<i>How well did the Results contribute to the Achievement of the project purpose/ objectives?</i>	Survey results will be compiled and analyzed to complement with data collected from the land-based survey in the participating countries. Final output of this joint program is the current status of oceanic tuna resources in Sulu and Sulawesi seas, which could be used to develop activities toward the sustainable management of such resources.	100
<i>Which has benefited on society and sector?</i>	Sectors who are engaged and involved with the management, capture, export-import, food security issues, etc.	100
<i>Have products and benefits been maintained?</i>	2 <sup>nd</sup> cruise survey of M.V. SEAFDEC 2 is planned tentatively in March 2015	

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 01201307
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Offshore Fisheries Resources Exploration in Southeast Asia		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2013 – 2017
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	
<b>Donor/Sponsor:</b>	Japanese Trust Fund	<b>Total Donor Budget:</b>	269,200 USD
<b>Project Partner:</b>		<b>Budget for 2015:</b>	50,900 USD
<b>Project leader:</b>	Mr. Sayan Promjinda (document prepared by Worawit Wanchana)		

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

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

The Southeast Asian countries have made attempts to expand their fishing activities in offshore areas in their respective EEZs, where fisheries resources are still under-utilized, for alternative fisheries resources. Over the years, SEAFDEC/TD has initiated and provided technical support to the Member Countries in their efforts toward exploring the fishery resources in their respective EEZs through various programs of activities. Considering the need to develop such under-utilized fishery resources, SEAFDEC/TD had conducted a series of activities aiming at building human resources and institutional capacities of the Member Countries on the exploration of fishery resources. During the past few years, TD organized a number of technical meetings, workshops and training activities related to fisheries resource exploration. The outputs from such activities could be referred to by the countries in order to facilitate the development of offshore fishery resources in their respective EEZs.

This project focuses on training activities and technical support for the Member Countries in offshore fisheries resources exploration in their EEZs through human resources capacity building programs including sea trials and cruise survey of the waters of the Member Countries using the M.V. SEAFDEC 2 and other research vessels. Collaborative research survey would be promoted in areas where fisheries resources are shared among countries in Southeast Asia.

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

Over the past few years, a number of countries in the region have increased their interest in carrying out explorations of their offshore fisheries resources to reduce the pressure of the over-exploited fisheries resources in near shore areas in their EEZs, and at the same time to find alternative fisheries resources. This is in line with the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Regional Towards 2020 as mentioned in the Plan of Action # 18 “*Investigate the potential of under-utilized fisheries resources and promote their exploitation in a precautionary manner based upon analysis of the best available scientific information*”. In this connection, this project would provide technical support to the Member Countries to enable the countries to explore under-utilized fisheries resources including offshore areas in their respective EEZs. This would be carried out in close collaboration with Member Countries that support the exploration of fishery/living resources in their EEZs. The project would engage the Member Countries in collecting information on their respective offshore fishery resources using the M.V. SEAFDEC2 in order to build their human resources capacity for offshore fishery resources exploration.

### **3. Expected Outcomes**

Information compiled through the project implementation could be used in the development of national/sub-regional plan of research/study on offshore fisheries resources exploration to be published

and shared among the relevant governmental agencies for development and management of appropriate offshore fishery resources.

Envisaged outcomes of the program implementation for the year 2015 include:

- 1) Information on offshore fisheries resources and status of exploitation of such resources are compiled through the collaborative tuna resource research cruise survey in sub-regional areas in Southeast Asia (during the pre-southwest monsoon season) and compared with data collected during post-monsoon season;
- 2) Data compiled and analyzed from results of offshore fisheries resource exploitation in Sulu Sulawesi Sea Sub-regional areas of Southeast Asia cruise survey (in 2014 and 2015) will be shared among countries concerned;
- 3) Potential fisheries officers gained experiences from the offshore fisheries resources exploration and post-harvest fish handling at sea after their involvement in the project using the M.V. SEAFDEC 2; and
- 4) SEAFDEC Member Countries are engaged in offshore fisheries exploration using the M.V. SEAFDEC 2 and learned the procedures and methods in conducting exploration of offshore areas.

### 3.1 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
<p>Outcome 1:</p> <ul style="list-style-type: none"> <li>- Scientific data compile from the cruise survey are used by concerned countries in developing policies on the management and sustainable utilization of oceanic tuna resources in Sulu and Sulawesi Seas</li> <li>- A set of SOPs for assessing the status of tuna resources in region or sub-region waters in Southeast Asia</li> <li>- Utilization of fisheries resources through improvement of post-harvest fish handling at sea onboard fishing vessels.</li> </ul>	<p>Output 1:</p> <ul style="list-style-type: none"> <li>- Data compiled are analyzed and included in the report of the joint program on tuna research in Sulu and Sulawesi Seas</li> <li>- Experience from the collaborative program serves as model for establishment of other sub-regional initiatives for offshore fisheries resources exploration</li> <li>- Participants enhanced their skills in post-harvest fish handling onboard fishing vessels through the regional training course</li> </ul>	<p>Activity 1:</p> <p>Organization of the Regional Offshore Fisheries Research Resource Exploration and Human Resource Development for Improving Post-harvest Fish Handling at Sea</p>	<ul style="list-style-type: none"> <li>- Participating countries of the tuna joint program in Sulu and Sulawesi Seas attend the technical meeting on the results of the tuna fisheries resource survey in Sulu and Sulawesi Seas in late 2014 and early 2015.</li> <li>- A regional or sub-regional consultation meetings organized, to explore the possibility of establishing research survey for offshore fisheries resources in Southeast Asian Waters utilizing the M.V. SEAFDEC 2</li> <li>- Approximately 30 participants from the member countries participate in the regional training course on improvement of post-harvest fish handling at sea</li> </ul>
<p>Outcome 2: Data compiled from the project are analyzed to serve as regional reference for assessment of stock status of tuna fisheries resources in Southeast Asia</p>	<p>Output 2:</p> <p>Based on feedbacks from previous exploration efforts, the SOPs are revised and/or a new SOPs are developed for offshore fisheries resources sampling gears</p>	<p>Activity 2:</p> <p>Modification of the Offshore Sampling Gears and Technical Project Publications</p>	<ul style="list-style-type: none"> <li>- Technical meeting conducted for revising current SOPs or developing new SOPs for offshore fisheries resources sampling gear(s).</li> </ul>
<p>Outcome 3: Sub-regional scientific findings are compiled and analyzed for</p>	<p>Output 3:</p> <p>Report of the cruise survey or land-based survey conducted by the</p>	<p>Activity 3: Technical Support of TD to the Cruise Survey</p>	<ul style="list-style-type: none"> <li>- Technical staff of TD joined the cruise survey and participated in the technical meetings on sub-regional</li> </ul>



Outcomes	Outputs	Activity	Key Performance Indicators
dissemination to countries concerned (on issues based on survey conducted)	technical staff of TD in collaboration with the participating countries are analyzed and disseminated to countries concerned		study/research on offshore fisheries resources survey.

### 3.2 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
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>Three sub-activities will be organized, namely: (i) Technical meeting on the results of the tuna fisheries resources survey in Sulu and Sulawesi seas; (ii) Regional (or Sub-regional) consultation to establish research survey for offshore fisheries resources in Southeast Asia Waters by utilization of M.V. SEAFDEC 2; and (iii) Regional training course on improvement of post-harvest fish handling at sea.</p> <p>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 2<sup>nd</sup> cruise survey of M.V. SEAFDEC 2 will also be discussed at the meeting. For the development of phase-2 activities to be implemented under this project between 2016 and 2017, a regional (or sub-regional) consultation would be organized.</p> <p>Under the last sub-activity, a 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>
Activity 2 Modification of the offshore sampling gears and technical project publications	<p>In order to strengthen quality of research survey on offshore fisheries resources, in particular, the tuna resource research survey in Sulu and Sulawesi Seas, modifications 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 package (s) of technical handbooks and training reports on improvement of post-harvest fish handling will be disseminated through the project website.</p>
Activity 3 Technical support of TD to the cruise survey	<p>This includes support of the project to the collaborative research cruise on tuna stock assessment in Sulu and Sulawesi seas as already planned to be carried out in March 2015. Technical staff of TD would join the 2<sup>nd</sup> cruise survey using M.V. SEAFDEC 2 in Sulu and Sulawesi seas, and other research vessels.</p>

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

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1:	Sub-activity 1.1		33,500	15,000	15,000	15,000
	Sub-activity 1.2	30,000		15,900	15,900	15,900
	Sub-activity 1.3			15,000	15,000	15,000
Activity 2:		2,000	1,000	1,000	1,000	1,000
Activity 3:		32,000	18,000	4,000	4,000	4,000
	<b>Sub-Total</b>	<b>64,000</b>	<b>52,500</b>	<b>50,900</b>	<b>50,900</b>	<b>50,900</b>

**PART II: PROPOSED ACTIVITIES FOR YEAR 2015****4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015**

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Activity 1	Jan~	1. Resource persons from Fisheries Research Agencies of Japan and other relevant agencies 2. Resource persons from Capture Fishery Technology Division of SEAFDEC/TD	I, II, and IV	45,900
Activity 2	Jan~	1. Existing SOPs on tuna resources survey in Sulu and Sulawesi seas 2. Technical staff of Capture Fishery Technology Division of SEAFDEC/TD	III	1,000
Activity 3		1. Technical staff of Capture Fishery Technology Division of SEAFDEC/TD	V	4,000

**PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION****5. Achievements of the Project Implementation for the Year 2014**

Regional initiatives on compilation and revision of the technical handbook and guideline on sampling gears and survey methodology for offshore fisheries resources exploration was continued.

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 2013.

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.

Project maintained the mechanism for sharing data and support information sharing of the research survey in offshore areas of the Member 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.

**5.1 Activities Conducted in the Current Project**

Table 5 List of activity conducted including involved stakeholders and budget spent

Activity	Type of activity*	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
Activity 1	I and V	30	7		38,000
Activity 2	I				3,000
Activity 3	V	3	5		10,000

**5.2 Output(s)**

Table 6 Logframe of the Output-Monitoring

Output	Key Performance Indicators	Achievement based on indicator in Year 2014	Remarks
Output 1: Joint program on tuna research in Sulu and Sulawesi Seas	<ul style="list-style-type: none"> <li>- Committed budget of the participating countries sharing for implementing the tuna research program in Sulu and Sulawesi Seas</li> <li>- Agreed work plan, SOPs for data collection onboard and on land for tuna resources survey (Skipjack, Bigeye, and Yellowfin tuna)</li> </ul>	(A) Technical meeting among participating countries of tuna research program in Sulu and Sulawesi Seas organized in Kuching (27 to 28 May 2014), Malaysia.  (B) Technical meeting among participating countries of tuna research program in Sulu and Sulawesi Seas organized in Tawau (19 to 21 August 2014), Malaysia	
Output 2: Modified sampling gears	<ul style="list-style-type: none"> <li>- Tuna samples during the cruise survey onboard M.V. SEAFDEC 2 using modified sampling gears</li> </ul>	(A) Modified sampling gears using for the research cruise of M.V. SEAFDEC 2 survey in Sulu and Sulawesi seas (17 Oct to 8 December 2014)	
Output 3: Experience of technical staff of the Member Countries onboard Koyo Maru, M.V. SEAFDEC 2 and others.	<ul style="list-style-type: none"> <li>- Report of the activities of TD staff and FiA staff of Cambodia onboard Koyo Maru</li> <li>- Summary of cruise survey report by TD</li> </ul>	(A) Technical assistance from SEAFDEC onboard Koyo Maru with the scientists of Fisheries Administration of Cambodia  (B) Technical assistance from SEAFDEC onboard M.V. SEAFDEC 2 with the researchers from Malaysia, Philippines, and Indonesia, in Sulu and Sulawesi seas (17 Oct to 8 December 2014)	

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	attached e-file
SOPs on Stock Assessment of Tuna Resources in Sulu and Sulawesi Seas	Hard copies	
SOPs on FAD survey in Sulu and Sulawesi Seas	Hard copies	
SOPs on Tuna Larvae Study in Sulu and Sulawesi Seas	Hard copies	
SOPs on Genetics Study on Tuna	Hard copies	
Report of activities onboard Koyo Maru – FIA Cambodia	Hard copies	To be provided
Report of activities onboard Koyo Maru – Training Department	Hard copies	To be provided
Cruise Survey Report – M.V. SEAFDEC 2 Survey in Sulu and Sulawesi Seas (17 October to 8 December 2014)	Hard copies	To be provided

### 5.3 Project Outcomes and Lesson Learned

Technical documents developed by the project can be used as the regional references for further development of similar initiatives in other sub-regional waters.

### 5.4 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.

## PART IV: EVALUATION

### 6. Project Evaluation

A number of technical documents are developed in collaboration and cooperation with the participating countries, namely Indonesia, Philippines, and Malaysia, and used for the tuna resources survey in Sulu and Sulawesi seas. Similar sub-regional initiatives could be further developed based on experiences and lessons learned from this project. Resource persons from the member countries are fully utilized.

Table 8 Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	Stock status of tuna resources in Sulu and Sulawesi seas can be reported for further development of appropriate fishery policy to sustain the tuna resources in that sub-regional waters. It can be considered that the project could successfully facilitate the development of scientific evidence to support management of fisheries in the project participating countries.	100
<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>	Project provided a fora where participating countries can discuss and agree on work plan, data recording-input-analysis-reporting.	100
<i>Which has benefited on society and sector?</i>	Very much benefit to the participating countries, namely Indonesia, Malaysia, and Philippines. In addition, other sub-regional countries can also use this as the format for develop their own similar initiatives.	100
<i>Have products and benefits been maintained?</i>	After completion of the project activities, it is envisaged that the participating countries will use the existing mechanism developed by the project for their future work on the assessment of tuna resources in Sulu and Sulawesi Seas.	100

## PROJECT DOCUMENT

Project id: 04201002			
<b>Program Categories:</b>	Programs under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	5 years (2010-2014)
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Malaysia
<b>Project Sponsor:</b>	JTF	<b>Project Partner:</b>	TD & TUMEC, DoF Malaysia
<b>Proposed Budget:</b>	222,566 USD	<b>This year budget:</b>	[2014] USD 11,500
<b>Prepared by</b>	Masaya Katoh & Syed Abdullah	<b>Project Leader</b>	Mr. Syed Abdullah & Ms. Wahidah

### 1. INTRODUCTION/BACKGROUND

Southeast Asian countries have been recognized as one of major nesting sites for sea turtles in the world. These reptiles are highly migratory and share several certain foraging habitats in the Southeast Asian region. Thus, regional cooperation among member countries in conserving sea turtles is vital to ensure their survival. In addition, regional effort should be undertaken to reduce the mortality especially due to accidental catch by fishing gears. This project is aimed to conduct several research activities to collect information about sea turtles in the foraging habitats, to reduce sea turtle mortality by fisheries, and to formulate the management plans of fisheries to protect sea turtles in this region.

Sea turtle activities correspond to #5 of Resolution at the ASEAN-SEAFDEC Conference in 2011 (*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 the development of the ASEAN Economic Community and the ASEAN Socio-Cultural Community*) and #29 of Plan of Action (*Recognizing the different management approaches that are required, sustainably manage major critical coastal habitats, such as mangroves, coral reefs and seagrass; and develop and disseminate information and guidance on appropriate tools and interventions*).

The performance indicators will be numbers of tagged sea turtles and studied individuals for DNA analysis in the research activities and publication of the plan of action for managing foraging habitats of sea turtles in the region.

### 2. PROJECT

#### 2.1 Goal/Overall Objectives and Performance Indicators

The objectives of this project are:

- 1) To collect ecological parameters of several pilot foraging habitats of sea turtles to study the key factors to manage these areas for sea turtle conservation;
- 2) To collect, compile, and review information of sea turtles migration corridors, nesting/foraging habitats, and their population structures in the region by genetic, satellite tracking, and conventional tagging studies for conservation and enhancement of the sea turtle populations in the ASEAN region;
- 3) To review fishing activities in the region which are possibly interacting with sea turtle populations in their foraging/nesting habitats and migration routes in space and time;
- 4) To promote responsible fishing gears and practices by conducting commercial demonstrations and experimental trials of modified specific fishing gears to protect sea turtle populations in the region; and
- 5) To formulate and propose management plans on fishing activities and other activities to conserve and enhance sea turtle populations in the region based on the scientific information.

## 2.2 Expected Outcomes and Outputs

The expected outputs of the project include the biological and ecological information of sea turtles and their foraging habitats, which can be used for development of the management and conservation plans of sea turtles, and promotion of mitigation measures for fisheries suitable for the ASEAN region to reduce the incidental capture of sea turtles.

The regional plan of action on sea turtle foraging habitats will be formulated by the end of the project. Through implementation of the plan of action, incentives for conservation among fishers and ordinary people will be established in the future. The incentives for conservation will be expected outcomes.

## 2.3 Project Description/Framework

### Activity 1: Meeting/Workshop

SEAFDEC/MFRDMD organized two workshops and one regional meeting and three preparatory meetings to implement the project. The meeting participants discussed an action plan for managing foraging habitats of sea turtles in the region.

### Activity 2: Research on Sea Turtle Foraging Populations

SEAFDEC/MFRDMD and other partner organizations with participants from selected member countries conducted two scientific surveys for ecological parameters in pilot foraging habitats (Lawas and Mabul and Sipadan islands). During the surveys, tissue samples of sea turtles (most of them were green turtles, *Chelonia mydas*) were obtained for genetic study. Probable natal origins were defined through Mixed Stock Analysis (MSA) of mtDNA sequencing data employing Bayes software. Inconel tagging activities were continued in member countries. MFRDMD conducted the satellite telemetry study. Information about sea turtle poaching will be discussed at the regional meeting. All available scientific data have been used to prepare an action plan for managing foraging habitats of sea turtles in the region.

### Activity 3: Interaction between Sea Turtles and Fishing (TD)

TD conducted the study for modification of responsible fishing gears and their practices to reduce the sea turtles by-catch. The use of c-hook in hook-and-line fishing was promoted in SEAFDEC Member Countries.

### Activity 4: Action Plan for Managing Foraging Habitats of Sea Turtles

An action plan for managing foraging habitats of sea turtles in the region has been formulated based on the scientific information. The action plan includes management on fishing activities that threaten adult sea turtles and abatement of egg poaching. The purpose of the action plan is to conserve and enhance sea turtle populations in the region.

### Activity 5: Publication

Two reports (i) Regional Plan of Action and (ii) Information on Sea Turtle Populations and Migration of Sea Turtles will be published. The report (ii) intends to summarize sea turtle activities conducted by SEAFDEC/MFRDMD since the first workshop on marine turtle research and conservation in 1996.

## 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2014

### 3.1 Activities Achievements in the Year 2014

Achievements based on Activities	Duration	Remarks
<b>Activity 6: Publication</b> Sub-Activity 6.1: Two reports will be published: i. Regional Plan of Action on Sea Turtle Foraging Habitats in Southeast	Jan. -Dec.	Report No. (i) will be published by end of October 2014 and

<p>Asian Waters; and</p> <p>ii. Information on Populations and Migration on Sea Turtles in Southeast Asian Region. The report (ii) intends to summarize sea turtle activities conducted by SEAFDEC/MFRDMD since the first workshop on marine turtle research and conservation in 1996.</p>		<p>the report No. (ii) will be published by December 2014</p>
--	--	---

### 3.2 Evaluation of the Project Outcomes Till the Year 2014

#### 3.2.1 Theme/Program Thrust and Issues:

<p><b>(1) Theme/Program Thrust:</b> Research and management of sea turtles in foraging habitats in the Southeast Asian waters/ Thrust IV: Providing Policy &amp; Advisory Services for Planning &amp; Executing Management of Fisheries</p>
<p><b>(2) Issues in the region at the beginning of the study:</b> Conservation of endangered marine animals in relation to fisheries is now matters of global concern. In the Southeast Asian region, six of the seven species of sea turtles in the world are distributed. They are highly migratory and recognized as the endangered species. Successful conservation and enhancement of sea turtle resources requires the scientific evidences on their ecological aspects such as migratory routes, reproductive and feeding behaviors and genetic structure, and on the status of incidental catch and habitat reduction related to their mortality.</p>

#### 3.2.2 Expected Final Goal of the Project:

<ul style="list-style-type: none"> <li>- To contribute to the formulation of a management/action plan of sea turtles inhabited in the ASEAN region with reference to the biological and ecological information;</li> <li>- To contribute to the formulation of management plans of fisheries that are suspected to have relationship with sea turtle habitats in space and time;</li> <li>- To develop and distribute mitigation measures for fisheries suitable for the ASEAN region to reduce the incidental capture of sea turtles.</li> </ul>
---

#### 3.2.3 “Steps” Toward Achieving Final Goal:

<p><b>Step 1:</b> Conservation and management of sea turtles</p> <ul style="list-style-type: none"> <li>- To study management of sea turtle hatchery;</li> <li>- To conduct sea turtle tagging survey in major nesting beaches in the region;</li> <li>- To collect and compile information on the current status of sea turtle nesting and conservation effort in the Southeast Asia;</li> <li>- To study and distribute the turtle excluder devices (TEDs) for the shrimp trawl fishery as a mitigation measure to reduce sea turtle by-catch.</li> </ul>
<p><b>Step 2:</b> Research for stock enhancement of sea turtles</p> <ul style="list-style-type: none"> <li>- To conduct sea turtle tagging and satellite tracking studies for nesting females in major nesting beaches to obtain ecological information about sea turtles such as migration route, foraging habitats, etc.;</li> <li>- To conduct the genetic analysis of nesting sea turtles to reveal the subpopulation structure of sea turtles in the region;</li> <li>- To study and distribute the usage of responsible fishing gear and practices, including C-hook instead of J-hook in several longline fisheries, etc. to reduce sea turtle by-catch.</li> </ul>
<p><b>Step 3:</b> Research and management of sea turtles in foraging habitats in the Southeast Asian Waters.</p> <ul style="list-style-type: none"> <li>- To conduct sea turtle genetic, tagging, and satellite tracking studies in their foraging habitats;</li> <li>- To compile ecological and biological information about sea turtles in the foraging habitats;</li> <li>- To conduct information collection of ecological parameters in pilot foraging habitats in the region;</li> <li>- To collect information on sea turtle poaching in the region;</li> <li>- To recognized fisheries which supposed to be closely related to sea turtle habitats in space and time;</li> <li>- To study and distribute effective mitigation measures to reduce sea turtle unintentional capture by artisanal fisheries in their foraging habitats;</li> <li>- To formulate the regional plan of action on sea turtle foraging habitats.</li> </ul>

3.2.4 Activities in the Current Project:

<b>(1) Current position of the project:</b> Step 3
<b>(2) Program duration:</b> 2010-2014
<b>(3) Main activities:</b> <ul style="list-style-type: none"> <li>- Regional Meetings/Workshops to discuss on the implementation plans, progress, and outcomes of this program.</li> <li>- Field survey to collect ecological information on selected pilot foraging habitats of sea turtles.</li> <li>- Genetic study of foraging sea turtles to reveal sea turtle population structures in the region.</li> <li>- Conventional tagging and satellite tracking studies of sea turtles to reveal sea turtle migration patterns and their nesting/foraging habitats in the region.</li> <li>- Information collection of sea turtle poaching in the region.</li> <li>- Research on interaction between sea turtles and fishing, including sound and hook-and-lines.</li> <li>- Dissemination of the outcomes from research on interaction between sea turtles and fishing, including sound stimuli and hook-and-lines.</li> <li>- Formulation of the regional plan of action on sea turtle foraging habitats.</li> </ul>

3.2.5 Progress and Achievements of the Current Project:

<b>(3) Main activities conducted in the current project</b> <ul style="list-style-type: none"> <li>- The Regional Planning Workshop, Regional Progress Workshop and two preparatory meetings for the management/action plan.</li> <li>- Field survey to collect ecological information on selected pilot foraging habitats of sea turtles.</li> <li>- Genetic study of foraging sea turtles to reveal sea turtle population structures in the region.</li> <li>- Conventional tagging and satellite tracking studies of sea turtles to reveal sea turtle migration patterns and their nesting/foraging habitats in the region.</li> <li>- Information collection of sea turtle poaching in the region.</li> <li>- Research on interaction between sea turtles and fishing, including sound stimuli and hook-and-lines.</li> <li>- Dissemination of the outcomes from research on interaction between sea turtles and fishing, including hook-and-lines.</li> </ul>	
<b>(2) Main achievements till the end of 2014 (tentative)</b> <ul style="list-style-type: none"> <li>- The Regional Planning Workshop, Regional Progress Workshop and two preparatory meetings for the management plan.</li> <li>- Ecological information of selected pilot foraging habitats of sea turtles was collected at Lawas and Mabul and Sipadan islands.</li> <li>- Genetic data on foraging sea turtles.</li> <li>- Inconel tagging at the focused nesting sites of sea turtles in participating Member Countries and tag recovery.</li> <li>- Satellite telemetry studies for one juvenile green turtle in Malaysia.</li> <li>- Research on interaction between sea turtles and fishing, including sound stimuli and hook-and-line.</li> <li>- Publication of two reports; (i) Regional Plan of Action on Sea Turtle Foraging Habitats in Southeast Asian Waters and (ii) Information on Populations and Migration on Sea Turtles In Southeast Asian Region.</li> </ul>	
<b>(3) Outcomes/Outputs during the project period and expected achievement rate till the end of 2014 (tentative)</b>	
Expected outcomes/outputs	Achievement rate (%)
- Meeting/Workshop	100%
- Field surveys to collect ecological information on selected pilot foraging habitats of sea turtles	100%
- Genetic study of foraging sea turtles to reveal sea turtle population structures in the region	100%
- Conventional tagging and satellite tracking studies of sea turtles to reveal sea turtle migration patterns and their nesting/foraging habitats in the region	100%
- Information collection of sea turtle poaching	100%
- Research on interaction between sea turtles and fishing, including sound stimuli and hook-and-lines.	100%
- Dissemination of the outcomes from research on interaction between sea turtles and fishing, including sound stimuli and hook-and-lines	100%



- Formulation of the regional plan of action on sea turtle foraging habitats	100%
- Publication of two reports (i) Regional Plan of Action and (ii) Information on Sea Turtle Populations and Migration of Sea Turtles	70% (RPOA ready to publish by end of October 2014 & the first draft of (ii) report will be ready by end of October 2014)

### 3.2.6 Evaluation of Project Activities in 2014:

More than one hundred specimens of sea turtles have been sequenced for the DNA study. They were captured at foraging habitats. The result of the genetic data will elucidate stock structure of green turtles, *Chelonia mydas*. Two reports (i) Regional Plan of Action on Sea Turtle Foraging Habitats in Southeast Asian Waters and (ii) Information on Populations and Migration on Sea Turtles in Southeast Asian Region by the end of 2014. These publications will be key references for management planning of sea turtles in the region.

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 01201308
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region: Facilitating fisheries activity information gathering through introduction of community-based resources management		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2013-2017
<b>Lead Department:</b>	Training Department (TD)	<b>Lead Country:</b>	
<b>Donor/Sponsor:</b>	Japanese Trust Fund-VI	<b>Total Donor Budget:</b>	USD 391,900
<b>Project Partner:</b>	None	<b>Budget for 2015:</b>	USD (56,000)
<b>Project Leader:</b>	Dr. Yuttana Theparoonrat-CSFDH		

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

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

Inland and coastal fisheries are other areas where the available fishery statistics are recognized to be under-reported due to the nature of fisheries as being multi-species and involving large number of small-scale fishers. It is therefore also necessary to improve data and information collection methodologies, acknowledged the concept and theoretical framework of fisheries management, *e.g.* by involving local communities, local officers, etc. in data collection, in order that the data could better reflect the importance of inland and coastal fisheries, and could be used as a basis for planning and management of fisheries.

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

SEAFDEC have been supporting Member Countries by reviewing the problems and constraints in fisheries data collection in coastal small-scale and inland fisheries at national level, and identify the key issues in fisheries data collection that should be addressed by the countries. In 2015, SEAFDEC will support Member Countries to organize on-site training on “Facilitating Fisheries Information Gathering Through Introduction of Community-based Fisheries Management”. This training course is aiming at capacity building of provincial officers of SEAFDEC Member Countries in terms of planning and implementation of autonomous community-based resources management. In addition, SEAFDEC will monitor the situation of member countries and facilitating planning and implementation of Community-Based Fisheries Management (CBFM) in the Member Countries.

### **3. Project Overall Objective, Outcomes, Outputs, Indicators and Activities**

#### **3.1 Expected Outcomes**

- 1) Improve compilation of fisheries and socio-economic information on coastal small-scale and inland fisheries in the Southeast Asia;
- 2) Improve the tool and methodology of fisheries data collection in coastal small-scale and inland fisheries;
- 3) Support member countries to introduce applicable practice of autonomous community-based resources management; and
- 4) Facilitate better understanding and knowledge on status and condition of coastal small-scale and inland fisheries at national and regional level.

### 3.2 Outputs, Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Improve compilation of fisheries and socio-economic information on coastal small-scale and inland fisheries in the Southeast Asia.	Output 1: Increased the capacity of ASEAN Member Country to identify the key issues in fisheries data collection that should be addressed by the countries.	Activity 1: Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region.	At least one exclusive report on Regional Workshop on Improvement of Fisheries Information Collection in Coastal Small-scale and Inland Fisheries of the Southeast Asian Region
Outcome 2: Improve the tool and methodology of fisheries data collection in coastal small-scale and inland fisheries.	Output 1: Strengthen knowledge and skill of ASEAN Member Country on the effective fishery information gathering and data collection in coastal small-scale and inland fisheries	Activity 1: Regional Training Course on Effective of Fisheries Information Gathering and Data Collection in Coastal Small-scale and Inland Fisheries for Southeast Asia	Conceptual and draft proposal for future activity on the mobile onsite workshop cum training for improving national the fishery information gathering as well as fishery data collection that will be carried out under collaboration among SEAFDEC/TD and the participants' own countries.
Outcome 3: Support Member Countries to introduce applicable practice of autonomous community-based resources management.	Output 1: Cultivating understanding on tools and introducing skills for establishment of autonomous organizations.	Activity 1: Strengthening training on site to introduce the appropriate participatory mechanism of autonomous community-based resources management including the methodology on gathering fisheries activity information	At least the last of training course, SEAFDEC have organized workshop on the process to establish Community-based fisheries management in every countries based on real situation of their project site, and including evaluation.
Outcome 4: Facilitate better understanding and knowledge on status and condition of coastal small-scale and inland fisheries at national and regional level.	Output 1: To develop practical models of community-based fisheries management of coastal small-scale and inland fisheries.	Activity 1: Monitoring and additional support for Member Countries activities of facilitating autonomous community-based resources management and gathering fisheries activity information  Activity 2: Study on appropriate activities sustainable for Community-based Fisheries Management (CBFM) in fisheries community.	At least, SEAFDEC will be selecting pilot site of each Member Country, including conduct base line survey, monitoring and evaluation.

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

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 in fisheries data collection in coastal small-scale and inland fisheries from the workshop will be utilized to identify the key issues that should be addressed by the countries. This could be achieved by fostering the lessons learned in terms of the methodologies and exchanging experiences in effective fisheries data collection. It was also envisaged that such effort could be adapted in the setting up of fisheries census with a future goal of improving fisheries data collection.
2) Strengthening training on site to introduce the appropriate participatory mechanism of autonomous community-based resources management including the methodology on gathering fisheries activity information	Training To Trainers (TOT) courses aimed at providing more clear and detailed concept and methodology on autonomous community-based resources management, required tools of data and information collection in coastal fishing communities for better development and management of coastal resources to ensure sustainable livelihood of coastal communities, and skills of establishment and development of community fisheries development organizations are very extremely needed for Southeast Asian Region.
3) Monitoring and facilitating 3.1 Monitoring and additional support for Member Countries activities of facilitating autonomous community-based resources management and gathering fisheries activity information	SEAFDEC is going to assist fisheries officers of SEAFDEC Member Countries in local training/workshop on establish CBFM project, including collecting and analyzing information from fisheries community for policy formulation, also in designing coastal and inland fishery management plans through participatory mechanism of co-management approach, that suit the local condition.
3.2 Study on appropriate activities sustainable for Community-based Fisheries Management (CBFM) in fisheries community in Southeast Asia.	SEAFDEC is going to assist SEAFDEC Member Countries in promoting CBFM and building the capacity of the fisheries community.

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

Table 3: Proposed Budget based on activity and sub-activity 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				34,000
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of autonomous community-based resources management including the methodology on gathering fisheries activity information		34,000	45,000	20,000	39,000	

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 3: Monitoring and facilitating	Sub-Activity 3.1: Monitoring and additional support for Member Countries activities of facilitating autonomous community-based resources management and gathering fisheries activity information	18,000	30,000	20,000	18,000	18,000
	Sub-Activity 3.2: Study on appropriate activities sustainable for Community-based Fisheries Management (CBFM) in fisheries community in Southeast Asia.	18,000	27,900	16,000	18,000	18,000

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-Activity, Workplan and Estimated Budget for the Year 2015

Table 4: Detailed Sub-Activity including inputs, period, estimated budget for 2015

Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Sub-Activity 2.1: Strengthening training on site to introduce the appropriate participatory mechanism of autonomous community-based resources management including the methodology on gathering fisheries activity information at Myanmar	June-Dec	<ul style="list-style-type: none"> <li>- Support national fisheries staff with the knowledge and skill on Co-management.</li> <li>- Provide the practical tool and methodology of fisheries data collection and analysis in coastal small-scale fisheries.</li> </ul>	<ul style="list-style-type: none"> <li>- Training on site</li> <li>- Workshop</li> </ul>	20,000
Sub-Activity 3.1: Monitoring and additional support for Member Countries activities of facilitating autonomous community-based resources management and gathering fisheries activity information at Vietnam	Jan – June	<ul style="list-style-type: none"> <li>- Strengthen practical in competence in planning and implementing the applicable management plans for fisheries community.</li> </ul>	<ul style="list-style-type: none"> <li>- Training on site</li> <li>- Workshop</li> <li>- Base line survey</li> </ul>	20,000
Sub-Activity 3.2: Study on appropriate activities to be sustainable for Community-based Fisheries Management (CBFM) in fisheries community in Thailand	June-Dec	<ul style="list-style-type: none"> <li>- Development pilot site with monitoring, evaluation, and consultation between fisheries officers and fisheries community</li> </ul>	<ul style="list-style-type: none"> <li>- Local workshop</li> <li>- Monitoring and evaluation</li> </ul>	8,000

Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Sub-Activity 3.2: Study on appropriate activities to be sustainable for Community-based Fisheries Management (CBFM) in fisheries community in Vietnam	Jan-June	- Development pilot site with monitoring, evaluation, and consultation between fisheries officers and fisheries community	- Local workshop - Monitoring and evaluation	8,000

### PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

#### 5. Achievements of the Project Implementation for the Year 2014

There have been many attempts in SEAFDEC's Member Countries to cope with the problems by implementing pilot projects to deal with their particular situation. In 2014, SEAFDEC/TD provided Training on Trainer (TOT) in Vietnam, and Mobile On-site Training (MOT) in Cambodia and Thailand. These activities have assisted fisheries officers of SEAFDEC's Member Countries to train community fishers by local trainers with technical assistance from SEAFDEC on organization of the community-based fisheries management with knowledge of rights-based fisheries management, also to design coastal and inland fishery management plans by selected the appropriate participatory mechanism of co-management approach, that suit the local condition.

##### 5.1 Activities Conducted in the Current Project

Table 5: List of activity conducted including involved stakeholders and budget spent

List of Actual Sub-Activity	Type of activity	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
<b>Activity 2</b>					
1. Training To Trainers (TOT) on Facilitating Fisheries Information Gathering through Introduction of Community-based Fisheries Management: Legislative and Institutional aspects of Right Based Fisheries Management, 13-15 August 2014. at Da Nang City, Vietnam	II. Training	30	0	0	22,000
<b>Activity 3</b>					
1. Mobile On-site Training (MOT) on Facilitating Fisheries Information Gathering Through Introduction of Community-based Fisheries Management, 1-7 July 2014, Nam Oon Dam, Sakon Nakhon Province, Thailand.	II. Training	40	0	0	6,200
2. Mobile On-site Training (MOT) on Practical Approach to Co-management in Marine and Inland Fisheries of Cambodia, 28 <sup>th</sup> July-1 <sup>st</sup> August 2014, Siem Reap, Cambodia.	II. Training	56	0	0	22,000

## 5.2 Output(s)

Table 6: Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Output 1: Strengthen knowledge and skill of ASEAN Member Country on autonomous community-based resources management including the methodology on gathering fisheries activity information	training on site to introduce the appropriate participatory mechanism of autonomous community-based resources management including the methodology on gathering fisheries activity information	Training on Trainer (TOT) on Facilitating Fisheries Information Gathering through Introduction of Community-based Fisheries Management: Legislative and Institutional aspects of Right Based Fisheries Management, 13-15 August 2014, Da Nang City, Vietnam. 40 participants of nation level was target group.	
Output 2: Cultivating understanding on tools and introducing skills for establishment of autonomous organizations in the fishing community.	At least the last of training course, SEAFDEC have organized workshop on the process to establish Rights-based fisheries management in every countries based on real situation of their project site, and including evaluation from SEAFDEC.	<p>1) Mobile On-site Training (MOT) on Facilitating Fisheries Information Gathering Through Introduction of Community-based Fisheries Management during 1-7 July 2014 in Nam Oon Dam, Sakon Nakhon Province, Thailand.</p> <p>2) Mobile On-site Training (MOT) on Practical Approach to Co-management in Marine and Inland Fisheries of Cambodia 28<sup>th</sup> July–1<sup>st</sup> August 2014, Siem Reap, Cambodia.</p> <p>3) MOT on Practical Approach to Co-management in Marine and Inland Fisheries of Cambodia during 17<sup>th</sup> – 21<sup>st</sup> November 2014, Koh Kong Province, Cambodia.</p>	
Output 3: To develop practical models of community-based fisheries management of coastal small-scale and inland fisheries.	At least, SEAFDEC will be selecting pilot site of each Member Country, and conducting base line survey, monitoring and evaluation step by step.	Local workshop to assist fisheries officer and fisheries community to prepare fisheries management activity, rule and regulation for sustainable fisheries resources in Nam Oon Dam, Sakon Nakhon Province, on 25-26 November 2014.	

Table 7: List of completed publications and others

List of completed publications for the year 2014	Type of media	Attached e-file
1. Report of TOT (Training on Trainer) on Facilitating Fisheries Information Gathering through Introduction of Community Based Fisheries Management: Legislative and Institutional Aspects of Rights-based Fisheries Management, 13-15 August 2014, Da Nang City, Vietnam	PDF	<Annex 1>
2. Report on Mobile On-site Training (MOT) on Practical Approach to Co-management in Marine and Inland Fisheries of Cambodia, 28 July-1 August 2014, Siem Reap, Cambodia	PDF	<Annex 2>
3. Report on Mobile On-site Training (MOT) on Facilitating Fisheries Information Gathering Through Introduction of Community-based Fisheries Management, 1-10 July 2014, Sakon Nakhon Province, Thailand	PDF	<Annex 3>

### 5.3 Project Outcomes and Lesson Learned

1. Base on training model, due to this, SEAFDEC Training Department has taken up this challenge to assist the Member Countries in building up and strengthen capability of the Member Countries' officers. In the past SEAFDEC will be invited Member Country to train at SEAFDEC/TD, but almost of Member Country sent the same participants to attend, who is not real person in community fisheries. Now SEAFDEC/TD used Training on Trainers (TOT) with Member Country, which will be conducted in the selected countries which aiming to give further technical support to the require countries under the collaboration manner.

2. The second step, Member Country will request SEAFDEC to organize Mobile on-site Training (MOT), this training is organized in order that the fisheries officers and community fisheries would clearly understand these concept as the fisheries officers are responsible for encouraging the fishers to apply the concept of inland fisheries management into practice. Meanwhile, the community fisheries can better participate in resources management.

3. As well as, these concepts of pilot site of each country can be able to apply in other area of country/SEAFDEC Member Countries for the sustainable resources management and improving fishers' livelihood.

### 5.4 Major Impacts/Issues

1. In case MOT (Mobile on-site Training), SEAFDEC need to emphasis to monitoring and facilitating only one project site of each Member Country, which selected by country, and promote this site to be case study of that country, but some country, especially Cambodia, they invited every province to participate in MOT, so a lot of cases to be consider and make difficult for SEAFDEC to be monitoring.

2. The language is important for both training of TOT and MOT, the translation from English to local language is needed for more understand of the participants in TOT. As well as MOT should have translator for the resource persons because during the presentation and discussion, so the result of training is not effectively for participants.

3. Moreover, the TOT should be adjusted to suit with the countries because each country has difference background on fisheries co-management. In addition, laws and policies of the countries need to support fisheries co-management or community based management. Vietnam and Cambodia used despotic, they don't have experience on extension officer, which working with community directly. It is difficult to successful in short time.

## PART IV: EVALUATION

### 6. Project Evaluation

Fisheries officers of SEAFDEC Member Countries expertise clear and detailed concept and methodology on autonomous community based resource management, required tools to facilitating on autonomous community based resource management such as tools of data and information collection in coastal fishing communities for better development and management of coastal resources to ensure sustainable livelihood of coastal communities, and skills of establishment and development of community fisheries development organizations are very extremely.

Table 8: Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	- Training on Trainer (TOT) in Vietnam - Mobile on-site Training (MOT) by monitoring and facilitating at Cambodia and Thailand	60%
<i>How well did the Results contribute to the Achievement</i>	There are two activities in TOT at Vietnam - Support national fisheries officer by provide conceptual	60%



Evaluation Criteria	From Project Leader	
	Views	%
<i>of the project purpose/objectives?</i>	<p>and case study on Fisheries Information Gathering through Introduction of Community-based Fisheries Management: Legislative and Institutional aspects of Right Based Fisheries Management.</p> <ul style="list-style-type: none"> <li>- Workshop on the process to establish Right-based fisheries management at coastal area</li> </ul> <p>There are two activities in MOT at Cambodia and Thailand</p> <ul style="list-style-type: none"> <li>- Local workshop, Strengthen practical in competence in planning and implementing the applicable management plans for fisheries community.</li> <li>- Monitoring and evaluation</li> </ul>	
<i>Which has benefited on society and sector?</i>	<ul style="list-style-type: none"> <li>- Increase number of fisheries officials and fishers to recognize autonomous community based resource management.</li> <li>- These activities have assisted fisheries officers of SEAFDEC's Member Countries to train community fishers by local trainers with technical assistance from SEAFDEC on organization of the community-based fisheries management with knowledge of rights-based fisheries management, also to design coastal and inland fishery management plans by selected the appropriate participatory mechanism of co-management approach, that suit the local condition.</li> </ul>	70%
<i>Have products and benefits been maintained?</i>	Yes	70%

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 01201308
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region: Improving the data collection of the commercially-exploited aquatic species and threatened species		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2013 – 2017
<b>Lead Department:</b>	TD in collaboration with MFRDMD	<b>Lead Country:</b>	
<b>Donor/Sponsor:</b>	Japanese Trust Fund	<b>Total Donor Budget:</b>	160,000 USD
<b>Project Partner:</b>		<b>Budget for 2015:</b>	32,000 USD
<b>Project leader:</b>	Mr. Sukchai Arnupapboon (document prepared by Worawit Wanchana)		

**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 threatened species: sharks.

Generally, primary goals of collecting fishery statistic are to obtain the information to manage fisheries. Trend and status of commercially exploited 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 is considered as one of the reasons of difficulty in sustainable management of coastal and marine fisheries resources. In particular, lack of data and statistics on the species listed on CITES appendices may have negative impact to the fisheries sectors of the countries in the region.

**2. Background and Justification**

In 2013, the project activities focus on improvement of data and information collection for commercially exploited aquatic species of sharks. This is to follow-up the output from a series of events, including the technical meetings in Thailand in 2011 and 2012 organized by TD, and the regional training course on shark species identification organized by MFRDMD in early 2012. The outputs from these showed that information on shark stock status in Southeast Asian Countries was not yet reliable. Because of lack of information on stock structure, abundance, life history, and reproductive capacity, in general, species by species statistics of sharks is lacking in Southeast Asian Countries. Moreover, insufficient policy and financial support on research and management of sharks is common key issues in the region<sup>1</sup>. 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.

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

In 2015, the project will organize midterm and end data collection meeting in order to compile and analyze shark data as regional level. Output of the meeting will be reported as regional shark data.

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

All shark data and information collected in 2014 and 2015 will be compiled and analyzed at country level and further compiled at the regional level through the meeting organized by TD in collaborate with MFRDMD. In this connection, the regional shark data output from meeting will be disseminated as regional shark data report. Subsequently, the regional study on shark data collection will be used as a basis for formulation of the plan of activities in 2016 to 2017.

#### 3.1 Expected Outcomes

It is envisaged that capacity of human resources and institute of the SEAFDEC Member Countries for shark data and information collection will be improved. However, it was found most of the countries in the region have yet started activity/program related to shark information collection. Under this project, there are two groups of the countries having different development level in data collection, including: (i) advanced countries in collecting shark data (*e.g.* Indonesia, Malaysia, Philippines, and Thailand); and (ii) less advanced countries in collecting shark data (CLMV countries).

In this connection, different set of support from the project will be designed in specific to the current status of the data collection. For those advanced countries in the region, it is expected that more complete set of data/information on sharks' utilization will be made available. Regarding the less advanced countries, it is planned that national initiatives for collecting sharks data will be established.

#### 3.2 Outputs Indicators and Activities

Table 1 Logframe on Project Follow-up, Monitoring and Evaluation

Outcomes	Outputs	Activity	Key Performance Indicators
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	- Work plan for data collection in the participating countries developed in consultation with the project staff - 1 <sup>st</sup> Onsite training on shark species identification for local enumerators in each participating countries organized
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	- The national data set validated by the project advisor
Outcome 3: - Effective implementation of the NOPA-sharks in the participating countries	Output 3: - National reports of shark landing - Regional analysis of the shark landing in the participating countries	Activity 3: Information Dissemination	- Scientific findings on shark landing in the participating countries - National plan for formulation of sharks' Non-Detriment Findings (NDFs)

### 3.3 Overall Scope/Description of Project

Table 2 Overall project description for activity

Activity	Description
Activity 1: Human resource development programs	
Activity 1.1 Planning meeting with the participating countries	<p>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.</p> <p>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 activities of data collection (2016) will be planed based on the final meeting. Moreover, capacity building within countries will be also encouraged where appropriate.</p>
Activity 1.2 Monitoring of data collection	To ensure that the implementation of shark landing data is systematically collected, the periodically monitoring and evaluation by project staff will be carried out.
Activity 1.3 Participation of project staff and focal point in relevant meeting/workshop	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.
Activity 2 Data collection	Between January and July 2015, shark data collection at the selected landing sites (e.g. catch and some biological data as discussed during the meeting in 2014) will be regularly collected. Pilot sites in the Member Countries including Cambodia, Indonesia, Lao, Malaysia, Myanmar, Philippines, Thailand and Vietnam will be further discussed. Format of data record, data inputs and analysis will be based on template developed during the 2014 meeting. It is planned that financial support for data collection at the selected landing sites will be borne by the respective countries or other source of fund where possible.
Activity 3 Information dissemination	Report of the regional shark data will be disseminated. With an aim to obtain the information to manage fisheries, this report is intended for SEAFDEC Department and Member Countries, fisheries-related agencies and organizations as well as the general public.

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

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1	Activity 1.1	27,000	27,000	27,000	27,000	27,000
	Activity 1.2	4,000	4,000	4,000	4,000	4,000
	Activity 1.3			0		
Activity 2				0		
Activity 3		1,000	1,000	1,000	1,000	1,000
	Sub-Total	32,000	32,000	32,000	32,000	32,000

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Activity 1	January	1. Resource persons from MFRDMD and TD 2. Sharks identification field guides	I	31,000
Activity 2	Jan to Dec	1. Agreed format and template for shark data collection, input, analysis, and reporting 2. Local enumerators for collecting data at the landing sites	I	0
Activity 3	December	1. Data set on shark landing in the pilot sites of the participating countries	I	1,000

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

#### Activity 1: Human resources development programs

##### Activity 1.1: Planning meeting with the participating countries

Regional Technical Working Group Meeting on Data Collection for Sharks in Southeast Asian Region was organized in Phuket in April 2014. Member Countries were encouraged to formulate contents and format of shark data collection, landing sites for data collection were selected.

TD organized the regional training of the trainers on elasmobranch taxonomy in May 2014 in Malaysia. The aim of this workshop was to provide format for data collection and also to transfer knowledge on taxonomy of elasmobranch to national trainers for data collection for shark and ray in the region. The training was attended by shark experts/researchers from Myanmar, Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

##### Activity 1.2: Monitoring of data collection

To achieve the implementation of the national activities on shark data collection, project supported shark experts from MFRDMD to monitor shark landing at the pilot sites of the participating countries (e.g. Indonesia, Malaysia and Philippines)

#### Activity 2

No activity in 2014

#### Activity 3

No activity in 2014

### 5.1 Activities Conducted in the Current Project

Table 5 List of activity conducted including involved stakeholders and budget spent

Activity	Type of activity*	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
Activity 1	I and II	40	5		42,000
Activity 2					
Activity 3					

## 5.2 Output(s)

Table 6 Logframe of the Output-Monitoring

Output	Key Performance Indicators	Achievement based on indicator in Year 2014	Remarks
Output 1: National capacity of the countries on shark species identification	- 16 trainers of the participating countries trained on shark species identification	(A) Organization of the regional training of the trainers on elasmobranch taxonomy in May 2014	
Output 2: Work plan for data collection on shark landing at the selected pilot sites in the participating countries	- Report of the working group meeting in April 2014	(A) Organization of the regional working group meeting on data collection for sharks in Southeast Asia in April 2014	
Output 3:	(no activity)		

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	attached e-file
Report of the working group meeting	Electronic and hard copies	

## 5.3 Project Outcomes and Lesson Learned

Participating countries of the project have agreed on the format and template for data collection on sharks. The project has been trying to encourage data collection of the shark landing in selected pilot sites of the participating countries. It is likely that the current financial support for implementing the project may not be sufficient for 2015 and onwards. In this connection, project has communicated with the possible financial support from CITES Secretariat. The result from the communication with the officer-in-charge of the EU funding support (in the budget category of supporting formulation of national NDFs) turned very positive. It is envisaged that project activities on data collection, including organization of the onsite training for enumerators, national planning meeting for shark data collection, allowance for local enumerators to collect data on shark landing, reports of the data collection, will be borne by the financial support from EU funding through the CITES Secretariat.

## 5.4 Major Impacts/Issues

The final products of the project implementation include 1-year data set of shark landing in the pilot sites, NDFs reports, and set of policy recommendations for effective implementation of NPOA-sharks in the participating countries.

## PART IV: EVALUATION

### 6. Project Evaluation

Table 8 Project Evaluation

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	Excellent. Resource persons from MFRDMD could transfer knowledge on shark species identification, especially on the species listed by CITES.	100
<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>	Good in terms of capacity of the countries in Southeast Asian region developed for identifying shark up to species level.	100

<b>Evaluation Criteria</b>	<b>From Project Leader</b>	
	<b>Views</b>	<b>%</b>
<i>Which has benefited on society and sector?</i>	The Member Countries can further work on planning in consultation with the project advisor where the national work plan for data collection on shark landing will be well developed. In case that the countries can implement data collection on shark landing, the NDFs report can be made.	100
<i>Have products and benefits been maintained?</i>	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.	

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

		Project id: 01201308	
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in Southeast Asian Region: Harmonization of fishery statistics in the Southeast Asian region		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2013 - 2017
<b>Lead Department:</b>	TD/Secretariat	<b>Lead Country:</b>	Vietnam
<b>Donor/Sponsor:</b>	Japanese Trust Fund	<b>Total Donor Budget:</b>	USD 29,840 (5-year)
<b>Project Partner:</b>	-	<b>Budget for 2015:</b>	USD 5,700
<b>Project leader:</b>	Ms. Nualanong Tongdee		

**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.

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

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

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

**3.1 Expected Outcomes**

- 1) Improved understanding of Southeast Asian countries on harmonized requirements for compilation of regional statistics;
- 2) More reliable and complete statistics data submitted from Southeast Asian countries; and
- 3) Improved understanding on status of fisheries in the region.



### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Improved understanding of Southeast Asian countries on harmonized requirements for compilation of regional statistics	Output 1: Strengthened coordination between SEAFDEC and Member Countries and relevant organizations on statistics-related matters	Activity 1: Coordination of work and participation in the relevant Consultations/ Meetings	Close communication/coordination, and participation of SEAFDEC staff to relevant international/ regional fora
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	Materials that facilitate better reporting of statistics from Member Countries
Outcome 3: Improved understanding on status of fisheries in the region	Output 2: Enhanced utilization regional fishery statistics and other data and information to provide understanding on fisheries	Activity 2: Production of publication on Southeast Asian State of Fisheries and Aquaculture	Publication on Southeast Asian State of Fisheries and Aquaculture published in 2017

### 3.3 Overall Scope/Description of Project

Table 2. Overall project description for activity

Activity	Description
<i>Activity 1:</i> 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.
<i>Activity 2:</i> 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.
<i>Activity 3:</i> 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.

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

Table 3. Proposed Budget based on activity and sub-activity for 2013-2017

Activity	(Unit: USD)				
	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
<i>Activity 1:</i> Coordination of work and participation in the Consultations/Meetings of relevant projects	1,500	1,500	1,700	1,700	1,700
<i>Activity 2:</i> Preparation/dissemination of materials to support the collection/reporting of statistics	5,500	4,240	-	-	-

<b>Activity 3:</b> Production of publication on Southeast Asian State of Fisheries and Aquaculture	-	-	4,000	4,000	4,000
<b>Sub-total</b>	7,000	5,740	5,700	5,700	5,700

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4. Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs <sup>1</sup>	Type of Activity	Proposed Budget
<b>Activity 1:</b> Coordination of work and participation in the Consultations/Meetings of relevant projects	Jan-Dec	Human	Others	1,700
<b>Activity 2:</b> Preparation/dissemination of materials to support the collection/reporting of statistics	-	-	-	-
<b>Activity 3:</b> Production of publication on Southeast Asian State of Fisheries and Aquaculture: Preparation of outline	Oct-Dec	Financial, information resources	Information Activities	4,000

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

In 2014, SEAFDEC continued coordination with Member Countries and relevant organizations to support submission of national statistics for regional/international compilation. SEAFDEC also participated in the 25<sup>th</sup> Session of the Asia and Pacific Commission on Agricultural Statistics (18-21 February 2014, Vientiane, Lao PDR) to reflect issues on regional statistics in the fora. To support reporting of better statistics from Member Countries, publication entitled List of Aquatic Animals and Plants in Southeast Asia was produced and disseminated, specifically to enhance reporting of statistics to SEAFDEC at more detailed species level.

#### 5.1 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 (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1</b>					
1.1 Communication and coordination	VI. Other	-	-	-	-
1.2 Participation to 25 <sup>th</sup> Session of the Asia and Pacific Commission on Agricultural Statistics (18-21 February 2014, Vientiane, Lao PDR)	VI. Other	-	-	-	917
<b>Activity 2</b>					
2.1 Production and dissemination of the List of Aquatic Animals and Plants in Southeast Asia	III. Information				1,412

<sup>1</sup> The financial, human, material, technological and information resources used for development interventions

## 5.2 Output(s)

Table 6. Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
<i>Output 1:</i> Strengthened coordination between SEAFDEC and Member Countries and organizations on statistics-related matters	Participation of SEAFDEC to relevant international/regional fora	Coordination with Southeast Asian countries on statistics related issues  Participation to 25 <sup>th</sup> Session of the Asia and Pacific Commission on Agricultural Statistics (18-21 February 2014, Vientiane, Lao PDR)	
<i>Output 2:</i> List of Aquatic Animals and Plants in Southeast Asia	Materials that facilitate better reporting of statistics from Member Countries	List of Aquatic Animals and Plants in SEA produced and disseminated to Member Countries, relevant organization and other users in 2014	

Table 7. List of completed publications and others

List of completed publications for the year 2014	Type of media	Attached e-file
1. List of Aquatic Animals and Plants in Southeast Asia	Publication	Downloadable at: <a href="http://www.seafdec.org/download/list-of-aquatic-animals-and-plants-in-southeast-asia/">http://www.seafdec.org/download/list-of-aquatic-animals-and-plants-in-southeast-asia/</a>

## 5.3 Project Outcomes and Lesson Learned

- Officers of Southeast Asian countries have improved understanding of on requirements for compilation of regional statistics
- More reliable and complete statistics data could be submitted from Southeast Asian countries. Nevertheless, the provision of statistics from respective countries is depended on the capacity of the respective country.

## 5.4 Major Impacts/Issues

Availability of statistics data depended on countries that provide data. Data sometimes are available from other sources (e.g. other Departments or) or in national languages, resulting in difficulties for consolidation.

## PART IV: EVALUATION

### 6. Project Evaluation

The nature of activities under this sub-project focuses on coordination and providing clarification/reference materials. While this sub-project could help clarifying the provision of statistics to be in line with the statistics framework; the availability and quality of data is subject to the respective countries; in which SEAFDEC Departments also undertakes projects to improve fishery data collection in various aspects. This sub-project could complement the routine activities of the SEAFDEC Secretariat in compilation of regional fishery statistics.

Table 8. Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	Inputs from the project are supportive to anticipated results. However, the provision of statistics from respective countries is also depended on the capacity of the respective country.	50

<b>Evaluation Criteria</b>	<b>From Project Leader</b>	
	<b>Views</b>	<b>%</b>
<i>How well did the Results contribute to the Achievement of the project purpose/ objectives?</i>	The results are along the line with project objectives.	60
<i>Which has benefited on society and sector?</i>	More complete and reliable statistics contribute to better management of fisheries.	60
<i>Have products and benefits been maintained?</i>	Yes, improved statistics could be beneficial for users in long-term.	80

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 04201302			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2013 - 2017
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	The Philippines
<b>Donor/Sponsor:</b>	JTF	<b>Total Donor Budget:</b>	USD 258,464
<b>Project Partner:</b>	None	<b>Budget for 2015:</b>	USD 40,972
<b>Project leader:</b>	Mr. Raja Bidin bin Raja Hassan		

## 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 of purse seine fisheries management systems/measures including TAC systems and other management measures in the world, the genetic study of a commercially important pelagic species, and 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/measures including TAC systems and other management measures in the world to examine which management system/measure is applicable for management of purse seine 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. Purse seine is one of the major fishing gears to catch those small pelagic fishes. So far in the region, licensing for purse seine is the only measures of fishery management. However, no scientific stock assessment has been conducted for those small pelagic fishes. The project involves compilation and comparison of annual and/or monthly catch per unit effort (CPUE) where data are available for the last three decades in the region, comparison of TAC systems 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 the abundance of a target species in fisheries, SEAFDEC/MFRDMD will make its first attempt to examine the trend of resources 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.

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 Expected Outcomes

- Suitable stock indicators in the selected Member Countries based on data analysis for the last five years.
- Comparison of TAC systems and other management measures for purse seine fishery.
- Improved management plans for purse seine fisheries in Member Countries

#### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Suitable stock indicators in the selected Member Countries based on data analysis for the last five years	Output 1: Trend of landings and CPUE for purse seine fishery in the Southeast Asian region	Activity 1: Comparative Studies for CPUE and TAC	a) A report on suitable CPUE and other indicators for resource levels in Member Countries
Outcome 2: Comparison of TAC systems and management measures for purse seine fishery	Output 2: Fishing capacity for purse seine fishery in the Southeast Asian region Output 3: List of management measures for purse seine fishery	Activity 1: Comparative Studies for CPUE and TAC	a) A report on comparison of TAC systems and other management measures in the world. b) Determination of fishing capacity for selected species and fishing gear c) Report on proposal for management measures
Outcome 3: Improved management plans for purse seine fisheries in participating Member Countries	Output 4: Estimated the genetic structures of commercially important pelagic species in the region	Activity 2: Genetic Data Collection and Analysis	a) MFRDMD receives tissue samples from at least four Member Countries. b) At least 35% of tissue samples received from Member Countries are analyzed.
	Output 5: Proposal for a management plan of purse seine fishery	Activity 3: Meetings for Effective Program Implementation	a) A comprehensive report involving more than 85% stakeholders
		Activity 4: Recommendation for Purse Seine Fisheries Management in the Southeast Asian Region	b) Project has achieved more than 70% of the target

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1) Comparative Studies for CPUE and TAC	SEAFDEC/MFRDMD will continue to examine purse seine fishery data to choose suitable stock indicators in the selected Member Countries. MFRDMD will concentrate on data analysis for the last five years in the region.  MFRDMD will continue to compare different management systems/measures in the world to examine which system/measure is applicable for management of purse seine fishery resources in the region. Comparisons about TAC systems and other management measures will include systems/measures in Japan, Norway and other countries. MFRDMD intends to clarify pros and cons of each management system/measure and to choose the best system/measure in the region with its requirements for Member Countries if applicable.
2) Genetic Data Collection and Analysis	<i>Amblygaster sirm</i> were chosen for the genetic study of a pelagic species in the South China Sea and Andaman Sea. Participating Member Countries and/or MFRDMD will collect reasonable number of specimens. Each specimen will be photographed and tissue samples for the DNA study will be shipped to SEAFDEC/MFRDMD for further analyses. Mitochondrial DNA markers will be used for the genetic study. Results of <i>Amblygaster sirm</i> will be compared with genetic studies of <i>Rastrelliger kanagurta</i> and <i>Decapterus maruadsi</i> that have been done by MFRDMD. Understanding genetic structures of commercially important pelagic species in the region will be used for effective purse seine fishery management.
3) Meetings for Effective Program Implementation	No scheduled activity in 2015, however MFRDMD will organize small meetings to discuss on development and progress of the overall project activities implementation.
4) Recommendation for Purse Seine Fisheries Management in the Southeast Asian Region	No activity in 2015

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

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(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	9,000	
	Sub-activity 1.3 Comparison of TAC systems in the world	25,000	5,000	10,000	9,000	
Activity 2: Genetic Data Collection and Analysis	Sub-activity 2.1: Equipment preparation for genetic study	15,000				
	Sub-activity 2.2 Sample collection		8,000	5,000		
	Sub-activity 2.3 Genetic study		9,526	15,972	9,866	3,000
Activity 3: Meetings for Effective Program Implementation	Sub-activity 3.1: Core Expert Meeting/Workshop		30,734		30,394	30,394

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
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
<b>Sub-Total</b>		<b>60,000</b>	<b>58,260</b>	<b>40,972</b>	<b>58,260</b>	<b>40,972</b>

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs <sup>1</sup>	Type of Activity	Proposed Budget
Sub-Activity 1.2 Verify CPUE and other indicators for resource levels in Member Countries	Jan-Dec	Expertise and reference materials	I. Research and Development activities	10,000
Sub-Activity 1.3 Comparison of TAC systems in the world (including other management measures)	Jan-Dec	Expertise and reference materials	I. Research and Development activities	10,000
Sub-Activity 2.2 DNA Sample collection	Jan-Dec	Expertise, equipment, reference materials and specimens.	I. Research and Development activities	5,000
Sub-Activity 2.3 Genetic study	Jan-Dec	Expertise, equipment, reference materials and specimens.	I. Research and Development activities	15,972

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

SEAFDEED/MFRDMD continued to compile and compare CPUE data for the last 30 years in Malaysia and Thailand where historical CPUE data are available to examine the trend of stock status for purse seine fisheries. The in-house meeting with a Japanese expert for Japanese Trust Fund VI on TAC was held in March. The expert provided suggestions about CPUE data analysis. MFRDMD has continued to compare different management systems/measures in the world to examine which system/measure is applicable for management of purse seine fishery resources in the region.

*Amblygaster sirm* were chosen for the genetic study of a pelagic species in the South China Sea and Andaman Sea. The participating Member Countries were asked to collect thirty-five specimens per location. Detailed sampling procedures were discussed at the Core Expert Meeting in August in Kuala Lumpur, Malaysia. Mitochondrial DNA markers will be used for the genetic study.

The CEM was held in August in Kuala Lumpur, Malaysia. The participating Member Countries presented overview of purse seine fishery in their counties. Two Japanese experts also presented TAC system and data collection and ABC determination in Japan. MFRDMD and its colleague presented regional synthesis of the fisheries information from Member Countries.

<sup>1</sup> The financial, human, material, technological and information resources used for development interventions



## 5.1 Activities Conducted in the Current Project

Table 5: List of activities conducted including/involved stakeholders and budget spent

List of Actual Sub-activity (1)	Type of activity*	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1: Comparative Studies for CPUE and TAC</b>					
Sub-activity 1.1 Case studies for CPUE in the Southeast Asian region	R and I	2	10	4	4,051
Sub-activity 1.3 Comparison of TAC systems in the world (including other management measures)	I	(18)	(15)	(2)	164
<b>Activity 2: Genetic Data Collection and Analysis</b>					
Sub-activity 2.2 Sample collection	R and I	8	0	0	4,508
Sub-activity 2.3 Genetic study	R and I	1	0	0	2,914
<b>Activity 3: Meetings for Effective Program Implementation</b>					
Sub-activity 3.1 Core Expert Meeting/ Workshop	I	18	15	2	42,624

## 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Output 1: Trend of landings and CPUE for purse seine fishery in the Southeast Asian region	(a) A report on suitable CPUE and other indicators for resource levels in Member Countries	Report was presented during the core expert meeting in Kuala Lumpur in August 2014	
	(b) A report on comparison of TAC systems in the world.	Report was presented during the core expert meeting in Kuala Lumpur in August 2014	
Output 2: Fishing capacity for purse seine fishery in the Southeast Asian region	(c) Report on comparative study of TAC system	In-house meeting to confirm findings and results	
	(d) Determination of fishing capacity for selected species and fishing gear	Regional analyses for pelagic fisheries in Andaman and the South China sea areas	
Output 3: List of management measures for purse seine fishery	(e) Report on proposal for management measures	Experts contribution during special meeting	
Output 4: Estimated the genetic structures of commercially important pelagic species in the region	(f) Number of samples received by MFRDMD from participating Member Countries	Dissemination of SOP for genetic study to all participating Member Countries before project implementation	
	(g) Percentage of the samples analyzed by MFRDMD	Technical visits organized to ensure proper species identification and sampling procedure	
Output 5: Proposal for a management plan of purse seine fishery	(G) A comprehensive report involving more than 85% stakeholders	Basic ideas based on Core Expert Meeting outputs	

Table 7: List of completed publications and others

<b>List of completed publications for the year 2014</b>	<b>Type of media</b>	<b>attached e-file</b>
1. Pelagic fisheries in the South China Sea areas	SEAFDEC newsletter	
2. Regional analyses for purse seine in the South China Sea	Presentation	

### 5.3 Project Outcomes and Lesson Learned

Comprehensive data compilation is required before any analyses could be carried out. A standardized management measures is quite difficult to achieve if the fishery scenario in participating Member Countries are very different.

### 5.4 Major Impacts/Issues

Once a project is approved for implementation, no major changes on activities are expected, otherwise project activities will not be running smoothly. Finalizations of the project activities are required during project proposal evaluation.

## PART IV: EVALUATION

### 6. Project Evaluation

During the Core Expert Meeting in August 2014, Member Countries presented various management measures such as licensing, closed season and closed areas for purse seine fisheries. However, CPUE data for purse seine fisheries were not sufficient and expertise in stock assessment was weak in the region. Member Countries need to collect good CPUE data on purse seine fisheries for sustainable fishery management.

Table 8 Project Evaluation

<b>Evaluation Criteria</b>	<b>From Project Leader</b>	
	<b>Views</b>	<b>%</b>
<i>How were inputs and activities converted to results?</i>	Data compilation is not comprehensive enough due to unavailable data reported by Member Countries. Submission of additional data is solely based on cooperation by participating Member Countries	80
<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>	Results generated were based on available information that may influence the overall project performance, purpose and objectives.	75
<i>Which has benefited on society and sector?</i>	Production of pelagic fish is quite stable due to the nature of targeted species and fishery. However, management of those species required global effort and inputs	75
<i>Have products and benefits been maintained?</i>	The end product is under development, that will be materialized at the end of project implementation in 2017	70

## PROJECT DOCUMENT

Project id: 04201303			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Research and Management of Sharks and Rays in the Southeast Asian Waters.		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2 yrs (2013-2014)
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Indonesia
<b>Project Sponsor:</b>	JTF	<b>Project Partner:</b>	
<b>Proposed Budget:</b>	USD 58,236	<b>This year budget:</b>	[2014] USD 33,646
<b>Prepared by</b>	Masaya Katoh and Ahmad Ali	<b>Project Leader</b>	Mr. Ahmad Ali

### 1. INTRODUCTION/BACKGROUND

Recently, 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 when needed. Identification of elasmobranch (sharks and rays) species is fundamental of biological data collection. Expertise in identification and biological data collection on sharks and rays in the region need to be strengthened. This project is aimed 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 and to publish field guide books on sharks and rays in the region with key features and biology.

These activities correspond to #10 of Resolution (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 #4 of Plan of Action (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).

The performance indicators will be the number of publications such as field guide books and the number of individuals collected for the DNA bar-coding study.

### 2. PROJECT

#### 2.1 Goal/Overall Objectives and Performance Indicators

The objectives of this project are:

- 1) To facilitate biological studies of sharks and rays in Southeast Asian waters in participating Member Countries through the workshop on taxonomy and identification of sharks and rays in 2012;
- 2) To study biology of major elasmobranch (sharks and rays) species, which will provide basic knowledge for conservation and enhancement of shark and ray populations in the region; and
- 3) To publish field guide books on sharks and rays in the region with key features and biology.

#### 2.2 Expected Outcomes and Outputs

The expected outputs for the project include the biological information of sharks and rays in the region, publication of field guide books on sharks and rays and a workshop on taxonomy and identification of sharks and rays.

Through those outputs, Member Countries will be able to collect biological and taxonomic data on sharks and rays in the region. Strengthened data collection of sharks and rays in the region will be established for sustainable utilization. The sustainable utilization will be an expected outcome.

## 2.3 Project Description/Framework

### Activity 1: Meeting/Workshop

#### *Sub-Activity 1.1:* Workshop on taxonomy and identification of sharks and rays

SEAFDEC/MFRDMD organized the workshop on taxonomy and identification of sharks and rays in 2012, which was conducted under the different project.

#### *Sub-Activity 1.2:* Regional Core Expert Meeting

SEAFCEC/MFRDMD will invite selected experts on sharks and rays from participating SEAFDEC Member Countries and SEAFDEC/SEC, and resource persons to participate in the Core Expert Meeting on Sharks and Rays in the first quarter of 2015. The meeting participants will review current available biological data on sharks and rays in the region, NPOA-sharks and a new Japanese Trust Fund project on sharks and rays for sustainable fishery from 2015.

### Activity 2: Research on Biology of Sharks and Rays

#### *Sub-Activity 2.1:* Data collection at landing sites

Shark and ray specimens were collected at landing sites in Pahang, Perak, Terengganu and Sarawak. Their biological data were recorded including sex and number of embryos/eggs if any.

#### *Sub-Activity 2.2:* Genetic study and information compilation

SEAFDEC/MFRDMD continued to compile genetic information on sharks and rays as an alternative identification method. Currently, DNA bar-coding research on sharks is progressing in the world. MFRDMD will conduct genetic research on some of the un-sequenced shark and ray species. Because of time and budget constraints, the new JTF project from 2015 will continue this sub-activity for elasmobranch species identification.

#### *Sub-Activity 2.3:* Publication of biological information on sharks and rays in the region

SEAFDEC/MFRDMD has prepared and published a book about biological information on sharks and rays in the Southeast Asian region in 2014.

## 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2014

### 3.1 Activities Achievements in the Year 2014

Achievements based on Activities	Duration	Remarks
<b>Activity 1: Meeting/Workshop</b> Sub-Activity 1.2 Regional Core Expert Meeting SEAFDEC/MFRDMD will invite selected experts on sharks and rays from participating SEAFDEC Member Countries and SEAFDEC/SEC, and resource persons to participate in the Core Expert Meeting on Sharks and Rays in the third/fourth quarter of 2014. The meeting participants will review current available biological data on sharks and rays in the region, NPOA-sharks and a proposal of the new Japanese Trust Fund project on sharks and rays for sustainable fishery from 2015.	Feb. 2015	

Achievements based on Activities	Duration	Remarks
<p><b>Activity 2: Research on Biology of Sharks and Rays</b></p> <p><i>Sub-Activity 2.2 Genetic study and information compilation</i>            The total of 27 species of sharks (143 specimens) and 41 species of rays (127 specimens) has been collected at six landing sites (Kuantan, Dungun, Kuala Terengganu, Mukah, Brait Island in Malaysia and Phuket Island, Thailand) for DNA barcoding and biological study. From that no. of samples, 49 individuals from 10 shark species and 15 individuals from 9 ray species were successfully sequenced for their DNA.</p> <p><i>Sub-Activity 2.3 Publication of biological information on sharks and rays in the region</i>            Two books entitled “Field guide to Rays, Skates and Chimaeras of the Southeast Asian Region” and “Standard Operating Procedure for Tissue Sample Collection and Preservation of Sharks and Rays” were published in 2014.</p> <p>Two research papers were presented during Asian Fish Biodiversity Conference, 12-13 February 2014 in Penang. Two paper presented at Regional Technical Working Group Meeting on Data Collection for Sharks in Southeast Asian Region, 22-24 April 2014 Phuket, Thailand. One poster about habitat preferences of sharks and rays in Malaysia, Indonesia and Thailand will be presented at the annual meeting of the Ichthyological Society of Japan in November 2014.</p>	Jan.-Dec.	DNA barcoding analysis will be continued in 2015

### 3.2 Evaluation of the Project Outcomes Till the Year 2014

#### 3.2.1 Theme/Program Thrust and Issues:

<p><b>(1) Theme/Program Thrust:</b>            Research and management of sharks and rays in the Southeast Asian waters/            Thrust IV: Providing Policy &amp; Advisory Services for Planning &amp; Executing Management of Fisheries</p>
<p><b>(2) Issues in the region at the beginning of the study:</b>            About 126 thousand tons of sharks and rays were captured in 2009 in the Southeast Asian region. High demands for shark fin in Asia raise a concern about shark populations. In 1998, FAO proposed International Plan of Action for the Conservation and Management of Sharks (IPOA-SHARKS) corresponds to increase of shark catch. SEAFDEC conducted the basic study of sharks in the ASEAN region in 2003-2004. Species composition and landing were available for one year at major ports in Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam. However, fisheries data on sharks and rays are still lumped in most Member Countries. More recently, 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 for sustainable utilization. Identification of elasmobranch species is fundamental of biological data collection. Expertise in identification and biological data collection on sharks and rays in the region need to be strengthened.</p>

#### 3.2.2 Expected Final Goal of the Project:

<ul style="list-style-type: none"> <li>- To train technical officers in the participating Member Countries to be able to collect biological data on sharks and rays in the region;</li> <li>- To provide basic biological data on sharks and rays in the region through research activities;</li> <li>- To publish field guide books on sharks and rays in the region with key features and biology.</li> </ul>
---

#### 3.2.3 “Steps” Toward Achieving Final Goal:

<p><b>Step 1:</b> Workshop on taxonomy and identification of sharks and rays</p> <ul style="list-style-type: none"> <li>- To conduct a workshop on taxonomy and identification of sharks and rays.</li> </ul>
<p><b>Step 2:</b> Research on Biology of Sharks and Rays</p>

- To collect biological data on sharks and rays at landing sites with an emphasis on their reproduction;
- To conduct genetic analyses of un-sequenced shark and ray species.

**Step 3:** Publish books on sharks and rays and identify human resources who work on sharks and rays in the region

- To publish field guide books on sharks and rays in the region with key features and biology;
- To identify experts on sharks and rays in the region for future regional cooperation;
- To publish a book on biological information on sharks and rays in the region.

### 3.2.4 Activities in the Current Project:

**(1) Current position of the project:** Steps 2 & 3

**(2) Program duration:** (2014) 2013-2014

**(3) Main activities:**

- Workshop on taxonomy and identification of sharks and rays was conducted from 22-26 April 2012.
- Research on biology of sharks and rays was conducted in 2014
- Publication of field guide books on sharks and rays in 2014
- Publication of a book on biological information on sharks and rays in the region (Note. Information on biology was included in two field guide books on sharks and rays).

### 3.2.5 Progress and Achievements of the Current Project:

**(1) Main activities conducted in the current project**

- Workshop on taxonomy and identification of sharks and rays was conducted from 22-26 April 2012.
- Research on biology of sharks and rays.

**(2) Main achievements till the end of 2014**

- Workshop on taxonomy and identification of sharks and rays was conducted from 22-26 April
- A book entitled 'Field Guide to Sharks of the Southeast Asian Region' was published in 2012
- A book entitled 'Look-alike sharks and rays species in the Southeast Asian Region' was published in 2013
- A book entitled 'Field Guide to Rays, Skates and Chimaeras of the Southeast Asian Region' was published in 2014
- A book entitled 'Standard Operating Procedure for Tissue Sample Collection and Preservation of Sharks and Rays' was published in 2014

**(3) Outcomes/Outputs during the project period and expected achievement rate till the end of 2014**

Expected outcomes/outputs	Achievement rate (%)
- Workshop/Meeting of sharks and rays. (Note: Regional meeting was postpone to first quarter of 2015.)	50% (it will be 100% by March 2015)
- Research on biology of sharks and rays	100%
- Publish field guide books on sharks and rays in the region	100%
- Identify human resources who work on sharks and rays in the region	100%
- Publish a book on biological information on sharks and rays in the region (information was available under sub-title biology in two field guide books on sharks and rays published in 2012 and 2014)	100%

### 3.2.6 Evaluation of Project Activities until end of 2014:

The total of 27 species of sharks (143 specimens) and 41 species of rays (127 specimens) has been collected at six landing sites (Kuantan, Dungun, Kuala Terengganu, Mukah, Bruit Island in Malaysia and Phuket Island, Thailand) for DNA barcoding and biological study. Three field guide books and one SOP were published. Those books have been used to increase local expertise on taxonomy and identification of sharks and rays in the region.

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

		Project id: 06201301	
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Assistance for Capacity Building in the Region to Address International Fish Trade-related Issues		
<b>Program Thrust:</b>	V	<b>Total Duration<sup>1</sup>:</b>	2013 - 2017
<b>Lead Department:</b>	Secretariat	<b>Lead Country:</b>	Thailand
<b>Donor/Sponsor:</b>	Japanese Trust Fund-6	<b>Total Donor Budget:</b>	USD 432,800
<b>Project Partner:</b>	None	<b>Budget for 2015:</b>	USD 65,300
<b>Project leader:</b>	Somboon Siriraksophon-PPC		

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

Recognizing the issues on trade in fish and fish products are greatly discussed and driven by international market and by various organizations, which rarely involve from fisheries authorities and sometimes lack of contribution to sustainable fisheries development and management aspects. A number of international instruments have been agreed or enforced by international organizations could determine impacts on sustainable development of fisheries in the Southeast Asian region, particularly developing countries where most of fisheries contribution come from small-scale fisheries sub-sector. In accordance to this, it is important to not only reconcile the international driven issues with the promotion on sustainable fisheries development, but more active evaluate the regional impact and addressing the regional concerns to the international fora are also needed.

### 2. Background and Justification

Since 1990s, SEAFDEC has monitored the potential international issues on fish and fish products and provided regional consultative forum to the ASEAN-SEAFDEC Member Countries, through this mechanism SEAFDEC provides fisheries authority of Member Countries with necessary information of the trade related issues and environment related task on international concerns such as the issues under UN General Assembly, WTO, FAO and CITES as well as large group of importer like EC and USA. Through the technical consultation, the results of regional discussions and conclusion were analyzed and came up with recommendation for national/regional action plan as well as the regional common/coordinated position to safeguard the interests of ASEAN-SEAFDEC Member Countries at the global fora. Therefore, it is crucial that SEAFDEC should keep monitoring the emerging international fish trade-related issues as well as environment-related task and fisheries-related issues, meanwhile it is also need to provide support to Member Countries through appropriate channels in order to reflect the regional collaborative efforts in managing fisheries and assist the Member Countries in developing regional common/coordinated positions, as well as push forward integration of views from fisheries agencies into those international instruments.

This project supports the 2011 ASEAN-SEAFDEC RES. No. 19. "Support the competitiveness of the ASEAN fish trade through the development of procedures and programs that would certify, validate or otherwise indicate the origin of fish to reflect the need for traceability, sustainable fishing practices and food safety, in accordance with international and national requirements".

<sup>1</sup> 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. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

#### 3.1 Expected Outcomes

- 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.
- 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.

#### 3.2 Outputs, Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
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	<ul style="list-style-type: none"> <li>- At least one exclusive summary/ report(s) on the Status of specific subjects under International Fish Trade-related Issues for each year to be submitted to FCG/ASSP Meeting for endorsement</li> <li>- At least 50% of AMS involve and/or participate to the Important international events such as CITES, Market measures, etc</li> </ul>
Outcome 2: Increasing the cooperation among ASEAN-SEAFDEC Member Countries to protect their fisheries and aquaculture development through the development of regional common/coordinated positions on the international fish trade-related issues.	Output 2: Adopted/ agreed on ASEAN-SEAFDEC common position and/or coordinated position and regional policy recommendation on international fish trade-related issues	Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations	<ul style="list-style-type: none"> <li>- ASEAN-SEAFDEC Common Positions on the Specific international fish trade-related issues <i>i.e.</i> CITES, Trade/Market measures, etc. based on the SEAFDEC Member Countries Interest in each year.</li> <li>- Agreed Regional and national policy recommendations related to enhance the sustainable fisheries and aquaculture development</li> </ul>
	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	<p>Awareness publications, news, articles related to the results from projects</p> <p>Updated SEAFDEC websites included the results from the project</p>



### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
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.
2) Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations	This is the key activity of the project, SEAFDEC will provide platform for Regional Consultation Meeting or even Senior Official Meeting (if required) in order to discuss and consider the international fish trade related issues in which may impacts to the development of fisheries and aquaculture in the Southeast Asian Region. The outputs from the RTC are the regional interest to be address at the International fora such as the draft of Regional Policy Recommendation, the ASEAN-SEAFDEC Coordinated Position and ASEAN Common Position. This draft would be further submission to the SEAFDEC Council director for endorsement and also submission to ASEAN for Common Position.
3) Building the awareness and disseminating from the Project outputs	Dissemination and promotion of the outputs from the project such as regional policy recommendations, ASEAN-SEAFDEC Coordination Positions and ASEAN Common Position to the public within and outside the Region.

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

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1: Monitoring & Enhancing the Capacity on International Fish Trade-related Issues	Sub-activity 1.1 Review the status of int'l fish trade-related issues	700	000	500	500	500
	Sub-activity 1.2 Coordinate with other regional and international organizations	15,000	19,000	5,500	25,000	10,000
Activity 2: Developing the Regional Recommendations, Common/ Coordinated Positions as well as regional fishery policy recommendations	Sub-activity 2.1: Provide platform to develop Common/ coordinated position and policy recommendation	60,000	119,000	57,800	73,000	35,000

Activity 3 Building the awareness and disseminating from the Project outputs	Sub-activity 3.1: Publicize the results within and outside the region	1,300	1,000	2,500	2,500	2,000
	<b>Sub-Total</b>	<b>80,000</b>	<b>139,000</b>	<b>65,300</b>	<b>101,000</b>	<b>47,500</b>

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Sub-Activity 1.1 Review the status of int'l fish trade-related issues including the important Issues such as the International Guideline for securing the sustainable small-scale fisheries, managing fishing capacity, and CITES CoP-17 issues.	Jan.-Dec.	- Updated information - SEAFDEC Member Country required	IV. Policy development activities	500
Sub-Activity 1.2 Coordinate with other regional and international organization.	Jan.-Dec.	- Attendance to Int'l fora -Cooperation with regional & international organizations	IV. Policy development activities	5,500
Sub-Activity 2.1: Provide platform to develop Common/ coordinated position and policy recommendation such as 1) development of Regional Guideline for securing sustainable small-scale fisheries, 2) development of the Regional Guidelines for managing fishing capacity in the region, and 3) coordinated position of the regional interests to address at the next CITES-CoP 17 in 2016.	May-Jun. And Nov.-Dec.	-Resource persons/expert on specific issues from MCs and organizations -Executive summary for each specific issue	IV. Policy development activities	57,800
Sub-Activity 3.1: Publicize the results/outputs from RTCs or project implementation within and outside the region	Oct.-Dec.	-Results from the project -Events for disseminate the results -updated SEAFDEC website	III. Information activities	2,500

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

The key achievements of the project implementation for the year 2014 are the outputs from development of the urgently needs on regional policy recommendations and regional guidelines through the cooperation with the lead Departments and ASEAN lead Countries such as:

- 1) Policy Recommendations for the Conservation and Management of Catadromous Eel Resources In Southeast Asia and for Sustainable Development of Catadromous Eel Aquaculture In Southeast Asia.
- 2) The ASEAN Guidelines for prevention the entry of fish and fishery products from IUU fishing/activities into the supply chain (in collaboration with MFRDMD and AMS);
- 3) The 1<sup>st</sup> draft of the ASEAN Catch Documentation Scheme/System based on Experts consultations (in cooperation with MFRDMD)

In addition, the projects could build the awareness on the combating IUU fishing that occurred within the ASEAN region, as well as management and conservation of Catadromous eel fisheries and resources.

## 5.1 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 (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1.1</b>					
1. Preliminary study on conservation and management of eels resources in the Southeast Asian Region	IV	0	2	5	0
2. Reviewed the issues/problems and challenge for Southeast Asian Countries to combat IUU fishing occurred within the region	IV	0	1	0	0
3. Supported the development of RFVR for 24m in length and over	IV	0	2	0	0
<b>Activity 1.2</b>					
1. Updated the information from the FAO resumed Technical Consultation on International Guidelines on securing sustainable small scale fisheries in FAO, Rome from 3-7 February 2014. The results of meeting are shared to ASEAN Member States for consideration and information.	IV	0	2	0	~8,000.00
2. Involved in the Asian regional consultative workshop on Capacity assessment for the implementation of new CITES listing of the sharks and manta rays during 13-15 May 2014	IV	0	2	0	~3,000.00
3. Progressed the SEAFDEC main activities related to the Regional implementation of the RCCRF, combating IUU fishing, and ect at the 31 <sup>ST</sup> Session of the Committee of Fisheries from 9-13 July 2014	IV	0	2	0	~8,000.00
<b>Activity 2.1</b>					
1. Internal Expert Meeting for the 1 <sup>st</sup> Draft of the Regional Guidelines for prevention the entry of fish and fishery products from IUU fishing/activities into the supply chain (based on the MCs Inputs during Experts Meetings organized by MFRDMD)	IV	0	12	0	~6,000.00

2. Meeting with ASEAN Lead Country (Singapore) for finalizing the 2 <sup>nd</sup> Draft of Regional Guidelines for prevention the entry of fish and fishery products from IUU fishing/activities into the supply chain (based on MCs Comments)	IV	1	8	0	0
3. Conduct the 2 <sup>nd</sup> Regional Consultation on Development of Regional Policy Recommendation on Sustainable Management of Eel Resources and Aquaculture Productions in the Southeast Asia, 31 August – 1 September 2014, Palembang, Indonesia	IV	12	16	6	41,000.00
4. Co-organized the RTC on Regional Guidelines for Preventing the Entry of Fish and Fishery Products from IUU activities into the Supply Chain” 23-25 September 2014, Horizon Hotel, Kota Kinabaru, Malaysia.	IV	15	8	1	22,000.00
5. Co-organized the Small Group Expert Meeting on Catch Documentation Schemes/ System, 14-16 October 2014, Concorde Inn KLIA, Sepang, Malaysia	IV	5	12	0	22,000.00
6. Co-organize the Regional Technical Consultation on ASEAN Catch Documentation System, 16-18 December 2014, XXXXX Hotel, XXXXX, Malaysia	IV				<28,000.0>
<b>Activity 3.1</b>					
1. The publicize the outputs from project to the Regional Events-related issues	III				1,000

## 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
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,	At least one exclusive summary/ report(s) on the Status of specific subjects under International Fish Trade-related Issues for each year to be submitted to FCG/ASSP Meeting for endorsement	1) The executive summary on the important International Fisheries-related Issues for 2014-15 based on the SEAFDEC meetings. This was reported to the 22 <sup>nd</sup> ASWGFi in Malaysia.	

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
	At least 50% of AMS involve and/or participate to the Important international events such as CITES, Market measures, etc		Baseline 2010
Output 2: Adopted/agreed on ASEAN-SEAFDEC common position and/or coordinated position and regional policy recommendation on international fish trade-related issues	ASEAN-SEAFDEC Common Positions on the Specific international fish trade-related issues <i>i.e</i> CITES, Trade/Market measures, etc. based on the SEAFDEC Member Countries Interest in each year.	No common positions	
	Agreed Regional and national policy recommendations related to enhance the sustainable fisheries and aquaculture development	<p>1) The 2<sup>nd</sup> draft of the Regional Guidelines for prevention the entry of fish and fishery products from IUU fishing/activities into the supply chain (in collaboration with MFRDMD and AMS);</p> <p>2) The 1<sup>st</sup> draft of the Policy Recommendations for the Conservation and Management of Catadromous Eel Resources In Southeast Asia and the 1st draft of the Policy Recommendations for Sustainable Development of Catadromous Eel Aquaculture In Southeast Asia. These included the issues/problems of the region were inputs from the Member Countries.</p> <p>3) The agreed immediate actions on conservation and management of catadromous eel resources that will be started by September 2014.</p> <p>The 1<sup>st</sup> draft of the ASEAN Catch Documentation Scheme/System &lt;in progress&gt;</p> <p>4) Zero draft of the ASEAN Catch Documentation Scheme for consideration by ASEAN-SEAFDEC Member Countries through the RTC</p>	
Output 3: Increased awareness to fisheries sector and promote the regional common/coordinated positions	Awareness publications, news, articles related to the results from projects	<p>The draft papers from Outputs 2 will be published and specifically distributed to the Regional Events such as:</p> <ol style="list-style-type: none"> <li>1) Eel Conference in Indonesia</li> <li>2) The 7<sup>th</sup> Coordination Committee Meeting by RPOA-IUU in Australia</li> <li>3) CTI-CFF High-level Meeting in Timor Leste</li> <li>4) 17<sup>th</sup> FCG/ASSP, in Thailand</li> </ol>	
	Updated SEAFDEC websites included the results from the project	On-going activity	

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	attached e-file
The 2 <sup>nd</sup> draft of the Regional Guidelines for prevention the entry of fish and fishery products from IUU fishing/activities into the supply chain (in collaboration with MFRDMD and AMS);	PDF	<Annex 1> Link to MFRDMD
The 1 <sup>st</sup> draft of the Policy Recommendations for the Conservation and Management of Catadromous Eel Resources In Southeast Asia and the 1 <sup>st</sup> draft of the Policy Recommendations for Sustainable Development of Catadromous Eel Aquaculture In Southeast Asia. These included the issues/problems of the region were inputs from the Member Countries.	PDF	<Annex 2> and <Annex 3>
The agreed immediate actions on conservation and management of catadromous eel resources that will be started by September 2014	PDF	.<Annex 4>
The executive summary on the important International Fisheries-related Issues for 2014-15 based on the SEAFDEC meetings. This was reported to the 22 <sup>nd</sup> ASWGF in Malaysia 14.	PDF	<Annex 5>
Zero draft of the ASEAN Catch Documentation Scheme for consideration by ASEAN-SEAFDEC Member Countries through the RTC (in collaboration with MFRDMD, Experts and Lead country);	PDF	<Annex 6>

### 5.3 Project Outcomes and Lesson Learned

Active cooperation with ASEAN lead country and all ASEAN Member States as well as developing the zero draft based on the problems and issues - faced in AMS - drafted by secretariat could help in developing and finalizing the regional policy recommendations. This is a good sign to meet the success on final endorsement by policy maker levels. Lesson learned on this process could be useful to technical department who dealing with development of the regional policy.

### 5.4 Major Impacts/Issues

There are many international fish trade-related for a that concerns to the Region, but due to the limitation of budget and human resources reduce the opportunity to enhance SEAFDEC concerned SEAFDEC who working on the subject. This impact affects directly to working efficiency.

## PART IV: EVALUATION

### 6. Project Evaluation

The project outputs are aligned with the work plan on supporting and working with the Technical Department, ASEAN Lead country and SEAFDEC Member Countries in developing the regional policy recommendations and ASEAN Guidelines on Combating IUU fishing as well as conservation and management of the endangered species or commercially exploited aquatic species. One of the interest and challenges to come up with regional policy that All ASEAN Member States could work together to prohibit exportation of glass eels outside the region, and promote /enhance the aquaculture development of eel within the region.

Another challenges is on the ASEAN Catch Documentation Scheme for all fish and fisheries products moving within the ASEAN region, where all AMS need to apply catch documents and certificates that cover domestic and exportation products.

Table 8 Project Evaluation

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	For Output1: The lessons learnt and updated situation from the international/and regional fora such as FAO on the International Guidelines for small-scale fisheries and the CITES capacity building on sharks and rays listed in the appendix-II are shared/provided to all	80

Evaluation Criteria	From Project Leader	
	Views	%
	AMS especially to those countries have not participate to the events. In addition, SEAFDEC plan to translate the guidelines for small-scale fisheries in collaboration with its Member Countries by 2015. Concerning the sharks and rays issues, to increase the capacity to AMS on conservation and management improvement, therefore SEAFDEC plan to promote the Catch Documentation system for sharks and rays. This would be aligned with ASEAN catch documentation schemes which are expected to be finalized by 2015.	
	Outputs 2: Overall inputs such as expert meetings and regional technical consultation with all ASEAN-SEAFDEC Member Countries are sufficient and converted to the results/outputs as shown in Table 7. In addition, AMS agreed on the Regional policy recommendation for both conservation and management of glass eels and promotion of intra-regional trade for aquaculture purposes.	80
	Outputs 3 building awareness of conservation and management of fisheries particularly on catadromous eels in Southeast Asia are successful that AMS could come-up with the Regional policy recommendation. For other international fish-trade related issues such as market driven measures, combating IUU fishing, and promotion of sustainable utilization of fisheries such as neritic tuna these results are shared to other international and regional events for future cooperation/collaboration to support AMS on implementations.	100
<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>	Increased the capacity of AMS to better understand the status and situation of the CITES-Sharks and rays, guidelines for small-scale fisheries, forms of IUU fishing occurred in the region and how to solve the solutions, catch documentation schemes as tools to combating IUU fishing and enhance intra-regional trade. As well as support in developing of policy recommendations, guidelines, RPOA and measures of the above subjects could guide AMS to move to the achievement of the project objective.	
<i>Which has benefited on society and sector?</i>	< On-going analysis >	
<i>Have products and benefits been maintained?</i>	< On-going analysis >	

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 06201302			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Strengthening SEAFDEC Network for Sustainable Fisheries		
<b>Program Thrust:</b>	V	<b>Total Duration:</b>	2013 - 2017
<b>Lead Department:</b>	Secretariat	<b>Lead Country:</b>	All ASEAN Member Countries
<b>Donor/Sponsor:</b>	Japanese Trust Fund-6	<b>Total Donor Budget:</b>	USD 280,000
<b>Project Partner:</b>	None	<b>Budget for 2015:</b>	USD 56,000
<b>Project leader:</b>	Ms. Sawitree Chamsai, on behalf of Policy and Program Coordinator		

## **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. This is not only among the Member Countries but also to relevant regional and international organizations. In order to strengthen the SEAFDEC network and enhance cooperation from Member Countries as well as to ensure the activities meet the requirements of the Member Countries. The monitoring and evaluation of overall SEAFDEC programs would 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 Fish for the People, and SEASOFiA.

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

SEAFDEC have 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 30<sup>th</sup> Meeting of the SEAFDEC Council and more clear after the new millennium in 2001 when ASEAN-SEAFDEC adopted the Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region” as well as the new decade Resolution and Plan of Action on Sustainable Fisheries for Food Security toward 2020 in 2011 as a policy guidelines for SEAFDEC and Member Countries. To support the implementation of the Resolution and Plan of Actions, taking into account environmental changes and many policy emerging issues pressing at global and regional levels including the problems of IUU fishing, SEAFDEC therefore proposes a continuing project to strengthening SEAFDEC network among ASEAN country in order to move forwards 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 mobilisation of resources and the harmonisation 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 organisations in combating IUU fishing”.

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

#### 3.1 Expected Outcomes

- Enhanced regional coordination and collaboration mechanism
- Strengthened monitoring and evaluation of the SEAFDEC programs and projects
- Strengthened the information dissemination of SEAFDEC projects results

#### 3.2 Outputs, Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
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) seconded at SEAFDEC Secretariat	Officials from at least 3 countries seconded at SEAFDEC Secretariat
		Activity 1.2: Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	At least two policy proposals were endorsed by the ASEAN higher fisheries authority
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 compile SEAFDEC programs/project activities	SEAFDEC programs/projects are regularly monitored
		Activity 2.2: Conduct the evaluation meeting	Evaluation results of SEAFDEC programs/projects are available
Outcome 3: Strengthened the information dissemination of SEAFDEC projects results	Output 3: Outputs/outcomes of SEAFDEC projects are compiled	Activity 3.1: Compile outputs/ outcomes of SEAFDEC projects	A package of outputs/outcomes of SEAFDEC projects are available
		Activity 3.2: Produce and disseminate of SEAFDEC special publications	SEAFDEC special publications are produced and disseminated

#### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	Regional Fisheries Policy Network (RFPN) Members are fisheries-related officers from ASEAN Member Countries which are invited and seconded at SEAFDEC/Secretariat to work together by sharing and updating the situation on national policy emerging and management framework as well as enhancing the capacity of RFPN Members through the study/analysis of regional fisheries-related issues, and coordinating between SEAFDEC and home country

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 compile 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.
2.2 Conduct the evaluation meeting <sup>1</sup>	The evaluation aims to answer specific management questions and to judge the overall value of an endeavor and supply lessons learned to improve future actions, planning and decision-making. Evaluations commonly seek to determine the efficiency, effectiveness, impact, sustainability and the relevance of the project or organization's objectives.
3.1 Compile outputs/ outcomes of SEAFDEC projects	All SEAFDEC project outputs/outcomes would be compiled for further dissemination through promotional media, online website and SEAFDEC Publications.
3.2 Produce and disseminate of 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.

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

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 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
Activity 1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	0	1,000	8,500	8,500	8,500
Activity 2.1: Monitor and compile SEAFDEC programs/project activities	1,000	1,000	5,000	5,000	5,000
Activity 2.2: Conduct the evaluation meeting	15,000	15,000	1,500 <sup>1</sup>	1,500 <sup>1</sup>	1,500 <sup>1</sup>
Activity 3.1: Compile outputs/ outcomes of SEAFDEC projects	500	500	2,000	2,000	2,000
Activity 3.2: Produce and disseminate of SEAFDEC special publications	7,000	7,000	7,000	7,000	7,000
<b>Sub-Total</b>	<b>55,500</b>	<b>56,500</b>	<b>56,000</b>	<b>56,000</b>	<b>56,000</b>

<sup>1</sup> Starting from 2015, each program/project evaluation would be incorporated in the SEAFDEC Project Document and would be discussed during the annual meeting of SEAFDEC Program Committee

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)				
Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Activity 1.1 Support and strengthen the Regional Fisheries Policy Network (RFPN) stationed at SEAFDEC Secretariat	Jan-Dec	- Officials from MCs	VI. Others	32,000
Activity 1.2 Enhance cooperation among SEAFDEC and Member Countries on the results of FCG/ASSP programs	Feb-Oct	-Cooperation among SEAFDEC and MCs - Policy proposals	IV. Policy development activities	8,500
Activity 2.1: Monitor and compile SEAFDEC programs/project activities	Jan-Oct	-Results of programs/projects activities from Technical Departments	III. Information activities	5,000
Activity 2.2: Conduct the evaluation meeting	Oct-Dec	-Results of programs/projects activities from Technical Departments	III. Information activities	1,500
Activity 3.1: Compile outputs/ outcomes of SEAFDEC projects	Sep-Dec	-Results from the project -Events for disseminate the results -Updated SEAFDEC website	III. Information activities	2,000
Activity 3.2: Produce and disseminate of SEAFDEC special publications	Mar, Jun, Sep- Dec	-Results from the project	III. Information activities	7,000
<b>Total in USD</b>				<b>56,000</b>

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

The key achievements of the project implementation for the year 2014 are the continued support RFPN and successful establishment of IFRDMD through a series of consultation with the Indonesian high fisheries authority. As the task given the Council, the conduct of the Consultation to prioritize issues for future regional program formulation also gave a direction for SEAFDEC in developing the future program. In the 4<sup>th</sup> quarter of the year, SEAFDEC compiled all the progress and results of the implementations and disseminated to all Member Countries and Donors for their consideration.

In addition, the results of project implementations were published and disseminated by the SEAFDEC publications such as Fish For the People, SEAFDEC Newsletters.

#### 5.1 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 (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1.1</b>					
1) 3 Regional Fisheries Policy Network (RFPNs) for Cambodia, Lao PDR and Vietnam are supported	VI	3	0	0	32,000
2) Enhanced 3 RFPNs capacity building through participations of ASEAN-SEAFDEC Meetings					
- Mini Symposium on the 10-years Achievements and Prospects for Future Cooperation with FRA/Japan, 23 Jan 2014, TH	III	Appeared in activity 1.2.1.1			
- The 4 <sup>th</sup> Meeting of SEAFDEC Program Review for Japanese Trust Fund V, in 25 Feb 2014, TH	VI	Appeared in activity 2.1.1.1			
- Regional Consultation Meeting on Identification of Prioritized Issues for Future Regional Program Formulation in 26 Feb 2014, TH	IV				
- 1 <sup>st</sup> Meeting on Information Gathering of Eel Resources and Aquaculture Productions in the Southeast Asia, in 27 Feb 2014, TH	III				
- ASEAN Regional Workshop for Facilitating Community-based Resources Management in Coastal and Inland Fisheries, 18-21 Feb 2014, Cambodia	IV	30	12	8	ASEAN Foundation
- The Sub-regional Consultative Meetings on the Collaborative Fisheries Management in					
• CM-Lao, 5-6 Feb 2014	VI	15	4	0	Sweden Project Fund
• CM-VN, 5-7 Mar 2014	VI	23	11	1	
• MY-TH, 14-15 May 2014	VI	17	8	8	
• North Andaman Sea 27-28 May 2014	VI	17	15	6	
• CM-Lao, 2-4 Jun 2014	VI	22	10	9	
- Expert Group Meeting on Regional Plan of Action on Sustainable Utilization of Neritic Tuna Resources In the Southeast Asia Waters, 18-20 Jun 2014, TH	IV	31	21	10	Sweden Project Fund
- Technical Workshop on Regional Fishing Vessel Record (RFVR) Database Development and Management in Southeast Asia, 20-21 Aug 2014	III	14	16	0	0
3) Increased knowledge of RFPNs through Training and Excursion program					
- On-the-job training on Project Development and Management using Result-based Management Approach, Apr-Jul 2014	VI	Special activity for RFPNs using funds that reported in other project			
- On-the-job training-writeshop on Technical Writing and Editing (Aug-Oct 2014)	VI				

- Excursion to the coastal areas provinces and fish landings, etc.	VI				
<b>Activity 1.2</b>					
1) Enhanced Collaboration with SEAFDEC Partners and ASEAN Member States					
- Organizing the Mini-Symposium on the "10-years Achievements and Onward Cooperation between FRA/J and SEAFDEC" and signing ceremony of MOU, 23 Jan 14, Bangkok	III	5	18	0	2,000
- Consultation Visit to Indonesia to discuss on IFRDMD Programs for 2015 and onward, Jakarta, Indonesia from 22-23 Jul 2014	VI	0	3	0	4,800
- Consultation Visit to FiA, Cambodia under the collaborative arrangements between NFU/Japan and FiA on the arrangements for KOYO Maru Cruise in Cambodia Water and Future Plan for Data Analysis, 15-16 September 14	VI	0	2	0	2,100
<b>Activity 2.1 &amp; 2.2</b>					
1) Evaluated SEAFDEC Projects					
- Organized the Fourth Meeting of SEAFDEC Program Review for Japanese Trust Fund-V and Identification of Prioritized Issues for Future Regional Program Formulation was convened in Bangkok, Thailand from 25 to 27 February 2014.	IV	15	36	3	37,000
<b>Activity 3.1</b>					
This activity will be conducted after the Program Committee Meeting	-	-	-	-	-
<b>Activity 3.2</b>					
1) Fish for the People for 1 <sup>st</sup> and 2 <sup>nd</sup> volume of 2014 has been published and distributed.	III	0	0	0	7,000

## 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Output 1: Strengthened cooperation with ASEAN Member Countries through RFPN and ASEAN higher authority on the results of FCG/ASSP programs	Officials from at least 3 countries seconded at SEAFDEC Secretariat	Official from Cambodia, Lao PDR and Myanmar seconded at SEAFDEC Secretariat and involved in several of SEAFDEC activities in order to enhance the cooperation between SEAFDEC and Member Countries as well as built up their capacity.	
	At least two policy proposals were endorsed by the ASEAN higher fisheries authority	The following list of policy proposals have been developed and would be submitted for endorsement during the next ASWGFi, SOM-AMAF etc. 1) The 2 <sup>nd</sup> draft of the Regional Guidelines for prevention the entry of fish and fishery products from IUU fishing/activities into the supply chain (in	

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
		collaboration with MFRDMD and AMS); 2) The 1 <sup>st</sup> draft of the Policy Recommendations for the Conservation and Management of Catadromous Eel Resources in Southeast Asia and the 1st draft of the Policy Recommendations for Sustainable Development of Catadromous Eel Aquaculture In Southeast Asia. These included the issues/problems of the region were inputs from the Member Countries; 3) The agreed immediate actions on conservation and management of Catadromous eel resources that will be started by September 2014; 4) The 1 <sup>st</sup> draft of the ASEAN Catch Documentation Scheme/System <in progress>.	
Output 2: the update/progress/ outputs of the project activities are regularly monitored and evaluated	SEAFDEC programs/projects are regularly monitored	Closed communication among Technical Departments and responsible person for each SEAFDEC project are maintained in order to update regularly the progress of the project activities	
	Evaluation results of SEAFDEC programs/projects are available	In Feb 2014, the 4 <sup>th</sup> Meeting of SEAFDEC Program Review for Japanese Trust Fund V was conducted to evaluate the JTF projects by invited external experts who have experienced on fisheries in the Southeast Asian fisheries. The results showed that	
Output 3: Outputs/ outcomes of SEAFDEC projects are compiled	A package of outputs/outcomes of SEAFDEC projects are available	On-going activity	
	SEAFDEC special publications are produced and disseminated	Fish For the People Vol. 12 No. 1-3 were produced 1,500 copies and so far were distributed 1,200 copies	

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media
The agreement between FRA/J and SEAFDEC	PDF
Report of the 4 <sup>th</sup> Meeting of SEAFDEC Program Review for Japanese Trust Fund V in Feb 2014	PDF
Evaluation results of the JTF projects	PDF
The List of Prioritized Issues for Future Regional Program Formulation	PDF
Fish for the People Vol. 12 no. 1-3	PDF

### 5.3 Project Outcomes and Lesson Learned

After a series of training and capacity building for SEAFDEC as well as RFPN members on management and development of projects using Results-based management approach. The overall project implementation and management is now using based on results-based management and the results of all projects are monitored and compiled based on its outputs and outcomes as well as impacts.

### 5.4 Major Impacts/Issues

Several former RFPN members have been promoted their positions and have been assigned to coordinate with some existing SEAFDEC project implementation, which demonstrated a good cooperation and successful implementation. In this regard, the continued cooperation with SEAFDEC is enhanced through the establishment of IFRDMD in Indonesia as well as the renew agreement between SEAFDEC and FAJ.

## PART IV: EVALUATION

### 6. Project Evaluation

The project outputs are in line with the work plan. However, there are still required active cooperation between SEAFDEC and Member Countries to strengthen the role of Lead Country and capacity of young officers stationed at Secretariat as RFPN Members in order them to better understand the regional activities /programs for future cooperation. Overall project implementation and management is now based on results-based management approach. With that the results of all projects are monitored and compiled based on its outputs and outcomes as well as impacts. Since this is in a transition period for adjustment of project document, some difficulties might be faced and modifications might need for improvement.

Table 8 Project Evaluation (for annual, and long term project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	For Output1: The activities to support and strengthen the capacity of RFPN seconded at SEAFDEC Secretariat had been provided the additional channel and coordination between SEAFDEC and Member Countries. Throughout a year of their services at SEAFDEC, the cooperation between SEAFDEC and Member Countries is maintained at the high caliber. Considering the cooperation with the Lead Country on the implementation and results of FCG/ASSP programs, several policy proposals have been developed and tabled at the ASEAN high authority for consideration and guidance. To some extent, 'SEAFDEC agenda' would be strengthened in the ASEAN high authority fora.	70
	Outputs 2: the outputs and outcomes of the project have been clearly identified in each SEAFDEC project development and management using results-based management. The results of this improved the performance and strengthened the monitoring and evaluation of all SEAFDEC projects. However, some modifications might necessary for improvement.	80
	Outputs 3: A package of outputs/outcomes of SEAFDEC projects would be compiled for further dissemination through promotional media, online website and SEAFDEC Publications.	50
<i>How well did the Results contribute to the Achievement of the project purpose/ objectives?</i>	Increased the capacity of RFPN to strengthen their roles in coordination and understanding on regional might need some times since there are lots of issues in fisheries while each RFPN member has different background and education. However, this is a good chance to learn and share experiences among the members. With that coordination among themselves and SEAFDEC would be strengthened.	60
<i>Which has benefited on society and sector?</i>	< On-going analysis >	
<i>Have products and benefits been maintained?</i>	< On-going analysis >	

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 06201303			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia		
<b>Program Thrust:</b>	Special Project	<b>Total Duration:</b>	5 years (2013-2017)
<b>Lead Department:</b>	SEAFDEC/Secretariat	<b>Lead Country:</b>	Varies depending on thematic area
<b>Donor/Sponsor:</b>	Sida (through the Embassy of Sweden, Bangkok)	<b>Total Donor Budget:</b>	Total budget of 5 years, 48 Millions SEK
<b>Project Partner:</b>	BOBLME, CTI-CFF FAO/APFIC, MRC UNEP, IUCN/MFF	<b>Budget for 2015:</b>	10,000,000 SEK (Approx 1,323,754 USD)
<b>Project leader:</b>	Ms. Pattaratjit Kaewnuratchadasorn, SEAFDEC-Sida Project Manager		

## 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

### 2.1 Overall Objectives (Outcomes objectives)

Sustainable use of aquatic resources and reduced vulnerability to climate change by coastal/rural (fishing) communities in the ASEAN region.

2.1.1 Bridging objective 1: Implementation of regional and sub-regional aquatic resources management actions by national institutions and organizations

2.1.2 Bridging objective 2: Establishment and implementation of regional and sub-regional fisheries and habitat management agreements and action plans.

### 2.2 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 <sub>i</sub> on fisheries and habitats. 2. Sub-regional and regional agreements promoted and reported to ASWGF <sub>i</sub> 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-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	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))

			fisheries (See also 2.8)	
		2. Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)	<p>2.1 Raised awareness of the need for fishing vessel registration and licenses to fish</p> <p>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</p> <p>2.3 The sharing of information with key stakeholders</p> <p>2.4 The drafting of plans to monitor, record and control active fishing capacity</p> <p>2.5 MCS network establishment.</p> <p>2.6 Social well-being network (See also 1.7)</p> <p>2.7 Diversified livelihoods (See also 1.8)</p> <p>2.8 The role of women and youth (young people of 15 years and older) in fisheries (See also 1.9)</p>	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	<p>3.1 Collaboration between ASEAN countries and regional, national and local organizations</p> <p>3.2 Collaboration between SEAFDEC and other regional and international organizations strengthened.</p> <p>3.3 Regional and sub-regional consultations</p> <p>3.4 Reviews and interpretations of important international conventions</p> <p>3.5 Sharing of information on legislation and institutional arrangements for fisheries and habitat management by ASEAN countries</p> <p>3.6 Information from project events made available to ASEAN bodies, SEAFDEC and ASEAN Member Countries</p>	Follow-up on regular ASEAN level and sub-regional consultations on social, habitat and fisheries issues. At least one ASEAN-wide, two sub-regional and two trans-boundary event org with partners (average 50 part) Note: focus on national and local organizations while 3.2 focus on regional and international organizations

			<p>3.7 Triggering of policy changes/ adjustments resulting from the work of the project</p> <p>3.8 The profile and status of fisheries within the ASEAN structure and policy development</p> <p>3.9 Strengthening the role of SEAFDEC in ASEAN</p>	
		4. Project Management and Coordination	<p>4.1 Expenses of Staff, RFPN and administration,</p> <p>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)</p> <p>4.3 Reporting costs, editing and printing</p> <p>4.4 Project monitoring and coordination, project mid-term review (year 3) and project evaluation (year 5)</p> <p>4.5 Operating, equipments and maintenance expenses</p>	

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).

### 2.3 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 (*i.e.* 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, 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 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.

Support the process to develop a regional plan of action for regional cooperation on neritic tuna and capacity program through the establishment of the scientific working group and improvement of data collection. Process results and outcomes and indicators on positive achievements and impacts 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, BOBLME, etc in recognition of steps being taken and impacts achieved.

In addition, SEAFDEC-Sweden project support 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. Through the program, the SEAFDEC Member Countries had been making its junior fisheries staff available as members of the RFPN, and their stint with SEAFDEC had been supported by the SEAFDEC-Sida collaborative project, now the SEAFDEC-Sweden collaborative project as well as by the Japanese Trust Fund for SEAFDEC.

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

## 2.4 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: SEK)

(Activity Group) Output Objective	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Output objective1: Capacity built for integration of habitat & fisheries management and adaptation to climate change	Output objective 1 have 9 activity “indicators” (see above) together with annual targets	Funds arrived late in 2013	2,405,000	2,305,000	To be assessed based on outcomes 2015	To be assessed based on outcomes 2016
Output Objective2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)	Output objective 2 have 8 activity “indicators” (see above) together with annual targets	Funds arrived late in 2013	1,995,000	1,895,000	To be assessed based on outcomes 2015	To be assessed based on outcomes 2016
Output Objective3: Capacity built and policy development processes improved for the drafting and implementation of regional & sub-regional agreements	Output objective 3 have 9 activity “indicators” (see above) together with annual targets	Funds arrived late in 2013	1,271,000	1,171,000	To be assessed based on outcomes 2015	To be assessed based on outcomes 2016

(Activity Group) Output Objective	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
4. Administration, personnel and coordination	1. Expenses of Staff, RFPN and administration 2. Planning meetings, regular coordination meetings (FAO/RAP/APFI C, 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)	Funds arrived late in 2013	3,201,000 In addition OH 10% on actual expenditure	3,501,000 In addition OH 10% on actual expenditure	To be assessed based on outcomes 2015	To be assessed 2016 include evaluation
	<b>Sub-Total</b>	<b>8,000,000</b>	<b>10,000,000</b>	<b>10,000,000</b>	<b>10,000,000</b>	<b>10,000,000</b>

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Project/Activity Title	Duration	Remarks
To address the components above, expected events to be carried out in 2015:		
1. Joint Workshop between Cambodia and Thailand (Koh Kong and Trat)	Jan	
2. Second consultation on the management and implementation of joint action for the South Andaman Sea (Indonesia, Malaysia and Thailand)	Second quarter	
3. Continued the process of the collaboration between neighboring countries in 4 sub-regions (Gulf of Thailand, Andaman Sea, Mekong river, and Sulu-Sulawesi sea) through the conduct of the meetings, workshop, etc.	Jan-Dec	
4. Regional Cooperation to Promote Sustainable Utilization of Neritic Tuna Resources in Southeast Asia Waters		
4.1 A series of the Scientific Working Group Meeting on Neritic tuna meeting: Standardize data collection, modes and develop the SOP, Tools	Feb, May July, Sept	
4.2 Improve data collection for Neritic Tuna focusing tonggol tuna, kawakawa, etc. Pilot project in Thailand, Malaysia, Indonesia	Jul-Dec	
4.3 Capacity building on EAFM for Neritic Tuna via Training and information dissemination, awareness building: Thailand, Vietnam, Indonesia, Malaysia, the Philippines	Mar-Sept	

<p>5. 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.</p> <p>6. On-site events to be organized in Indonesia, Malaysia, Thailand, Myanmar, Cambodia, Vietnam, Lao PDR and the Philippines in support of sub-regional dialogue and cooperation in the four target sub-regions.</p> <p>7. Active participation envisaged by the project to regional and international events organized by FAO/APFIC, Sida, CTI-CFF, UNEP, MRC, RPOA-IUU, BOBLME, SEAFDEC, SwAM, SEAFDEC/ Japanese Trust Fund (JTF), and others.</p> <p>8. Strengthening the capacity of young fisheries officers with a variety of specializations and skills have been dispatched from the Member Countries through the SEAFDEC Regional Fisheries Policy Network (RFPN). (The SEAFDEC-Sweden collaborative project as well as by the SEAFDEC/JTF provide financial support to 8 Member Countries).</p> <p><i>Note: Aspects of climate change, gender will be integrated in all outputs groups as a cross-cutting matter to be considered.</i></p>		
---	--	--

### PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

#### 5. Achievements of the Project Implementation for the Year 2014

In 2014, the SEAFDEC-Sweden project has been successfully promoting sub-regional (tri-lateral and bi-lateral) arrangements, specific focus to the Andaman Sea (in cooperation with the BOBLME), the Gulf of Thailand, the Mekong River Region (in cooperation with the Mekong River Commission) and the Sulu-Sulawesi Seas (in cooperation with the Coral Triangle Initiative). In managing fishing capacity and to combat illegal and destructive fishing, SEAFDEC and the project will coordinate with the Regional Plan of Action (RPOA-IUU) to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region.

A main thrust in the process of implementation is to support the trend amongst ASEAN-SEAFDEC Member Countries, to develop agreements between countries on matters of importance to ecosystems based cooperation. This includes management matters, such as (larger) fish resources conservation areas (*e.g.* building upon MPAs, *refugia*, etc), fishing capacity (IUU Fishing) management, social mobility and conflicts, etc.

In 2014, the SEAFDEC-Sweden project has been provided avenues for the SEAFDEC Member Countries to discuss and look for effective ways of improving the management of fisheries to sustain the fisheries resources and fisheries and habitat management in the sub-regions, which includes:

1. Gulf of Thailand sub-region: (Thailand-Malaysia and Cambodia-Vietnam)
2. Andaman Sea sub-region: (Thailand-Myanmar, Thailand-Malaysia-Indonesia)
3. Mekong River Basin sub-region: (Cambodia-Lao PDR)

Positive progress has been made through the Memorandum of Agreement (MOA) between Cambodia-Vietnam specifically focus on support to the fisheries sector by implementing joint actions in areas of common interest in and around Kien Giang Province of Vietnam and Kampot Province of Cambodia signed in April 2014 and a draft MoA between Cambodia-Lao PDR which focus to enhance communication and cooperation in areas of common concern to Cambodia and Lao PDR in neighboring provinces of Stung Treng and Preah Vihear (Cambodia) and Champasak province (Lao PDR) as well as with regards to further consolidation of the Planning and Development Committee with Myanmar and Thailand for the Myeik Archipelago/Northern Andaman Sea.

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.

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 SEAFDEC-Sweden project will build up the capacities of already existing units and projects. The links to other organizations and ongoing projects is another factor in assuring adequate support and support capacity and the sustainability of project outcomes. At national level, coordination will continue with the respective fisheries, environmental and other agencies, as applicable. Through sub-contracts in 2014, SEAFDEC have been established the agreement with the Learning Institute, Cambodia, CORIN-Asia, Cambodia and CORIN-Asia Myanmar and the Prince of Songkla University (PSU), Had Yai, Thailand. Furthermore, discussions are under way for additional sub-contracts with the Sustainable Development Foundation, Thailand, Burapha and Kasetsart University. The project will follow up with earlier identified groups such as the University of Mergui, Myanmar, PLPBM in North Sumatra, Indonesia and others including WWF and IUCN/MFF.

At the Regional level, the project also has been supported the process of the development of the Regional Plan of Action on Sustainable Utilization of Neritic Tunas in the ASEAN Region (RPOA-Neritic Tuna). Finally, the 1<sup>st</sup> draft of the Regional Plan of Action on Sustainable Utilization of Neritic Tunas in the ASEAN Region (RPOA-Neritic Tuna) and the draft Capacity Building Program to support the implementation of the RPOA-Neritic Tuna will be submitted to for consideration of the ASEAN and SEAFDEC authorities through the respective ASEAN and SEAFDEC mechanisms. This year, the SEAFDEC-Sweden project hosted the 1<sup>st</sup> Meeting of the Scientific Working Group on Neritic Tuna Stock Assessment in the Southeast Asian Waters.

In addition, SEAFDEC will continue to cooperate with ASEAN, BOBLME, MRC, CTI-CFF, FAO/APFIC, RPOA-IUU, MFF/IUCN, ILO and others as applicable. This has placed SEAFDEC in a position to add value and build upon the work implemented by other organizations as well as the earlier interventions facilitated through the SEAFDEC-Sweden cooperation. Processes of regional consultations will involve all ASEAN-SEAFDEC Member Countries whilst initiating a dialogue as suitable with non-ASEAN Countries (Australia, Timor-Leste, Papua/New Guinea and India) in cooperation with the RPOA-IUU, BOBLME and others.

## 5.1 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	
<b>Output objective 1: Capacity built for integration of habitat &amp; fisheries management and adaptation to climate change</b>					
1. The 1 <sup>st</sup> Technical Meeting of the Joint Working Team for Fisheries Management between Cambodia and Vietnam , 5-7 March 2014 (link also to Output objective 3)	P	26+ 3 (RFPN)	5	2	
2. The Technical Workshop of the Joint Working Team for fisheries Management between Cambodia and Vietnam, 6-7 October 2014 (link also to Output objective 3)	P	14+2 (RFPN)	6	-	
3. A round-table Discussion between Cambodia and Lao PDR, 5-6 February 2014 (link also to Output objective 3)	P	15	4	-	
4. The Internal Meeting for the Review Information on the Legal Framework for Fisheries Management in Trans-boundary Areas between Cambodia and Lao PDR, 20-21 May 2014 (link also to Output objective 3)	P	17+ 1(RFPN)	-	-	

5. The 1 <sup>st</sup> Meeting of the Technical working Group for Fisheries Management in Trans-boundary Areas between Cambodia and Lao PDR, 2-4 June 2014 (link also to Output objective 3)	P	22+4 (RFPN)	6	9	
6. The Workshop of the Technical Working Group for Fisheries Management in Trans-boundary areas between Cambodia and Lao PDR, 8-9 October 2014(link also to Output objective 3)	P	12+3 (RFPN)	5	-	
7. The Sub-regional Consultation of the Northern Andaman Sea and Myeik Archipelago (Thailand and Myanmar), 27-28 May 2014 (link also to Output objective 3)	P	17+3 (RFPN)	12	6	
8. Participated in the training course on Essential Ecosystem Approach for Fisheries Management organized by SEAFDEC/TD, 20-30 Jan 2014	T	6 (RFPN)			
9. 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				
10. Conduct the Sustainable Use of National Resources and Livelihoods Development for Climate Change Resilient Coastal Communities (sub-contract)	R				
11. Conduct the “Strengthening of Communities Fisheries Management and Livelihoods Diversification in Cambodia (Sub-contract)	R				
12. Conduct the study on “Local Ecological Knowledge and Benefit Sharing Approaches for Small Island Fishery/Tourism Management in Lipe Island, Andaman Sea (Sub-contract)	R				
<b>Output objective 2: Capacity built and systems improved for the management of fishing capacity (monitoring; record and control)</b>					
1. In-house Seminars on Issues Requiring Increased Attention “Work in Fisheries” Working Conditions, Employment and the Need to rely on Migratory Labour: role s and Response by Fisheries Agency, Regional Organizations (ASEAN) and SEAFDEC, 12 February 2014	T	13	22		
2. Conduct the Study on the Status of Fisheries Resources in Phu Quoc Island and surrounding areas, Vietnam (sub-contract from Jan-June 2014)	R				
3. Conduct the Study on the Status of Fisheries Resources along Coastal Cambodia (sub-contract from Jan-June 2014)	R				
4. The Sub-regional Technical Meeting on Effective Fisheries Management between Malaysia and Thailand, 14-15 May 2014	P	25+3 RFPN	9		
5. Strengthening Malaysian and Thai Partnership in support of Joint Fisheries Planning and Management in the Western Gulf of Thailand (conducted by TD)	R				
5.1 Discussion with MRFDMD and relevant agencies in Malaysia, 4-7 November 2014	R				
<b>Output objective 3: Capacity built and policy development processes improved for the drafting and implementation of regional &amp; sub-regional agreements</b>					
<b>Activity 1. The Development of Regional Plan of Action on Sustainable Utilization of Neritic Tuna</b>					
1. The Expert Group Meeting on the Development of Regional Plan of Action on Sustainable Utilization	P	15+ 7 (RFPN)	14	7	



of Neritic Tuna in southeast Asian Waters, 18-20 June 2014					
2. The Stakeholder Consultation on RPOA-Neritic Tuna in the Philippines, 21-22 October 2014	P	60+1 (RFPN)	1		
3. The Expert Meeting on Mekong Cooperation on Fisheries, Aquatic Resources and Wetlands: 15 years lesson learnt, 12-14 Nov 2014, Phnom Penh	P	55+ 5(RFPN)	9		
<b>Activity to promotion bi, tri cooperation and arrangement (also link to Outputs objective 1)</b>					
<b>Activity: Participation in the non-SEAFDEC-Sweden events and policy forum</b>					
1. The 4 <sup>th</sup> Meeting of SEAFDEC Program Review for Japanese Trust Fund V and Identification of Prioritized Issues for Future Regional Program Formulation, 25-26 February 2014	P		2		
2. The Consultation on National Plan of Action (NPOA) to Combat Illegal, Unreported and Unregulated (IUU) Fishing for Cambodia, 20-21 March 2014	P		2		
3. The 46 <sup>th</sup> Meeting of SEAFDEC Council, 1-4 April 2014	P		3		
4. The Sub-regional Technical Working Group Meeting of SEAFDEC Joint Program for Tuna Research in Sulu-Sulawesi Sea, 27-28 May 2014	P		1		
5. The 5 <sup>th</sup> APFIC Regional Consultative Forum Meeting, 19-25 June 2014	P		1		
6. IOTC Working Party on Neritic Tunas, 29 June-2 July 2014	R		1		
7. The Technical Workshop on Regional Fishing Vessel Record (RFVR) Database Development and Management in Southeast Asia, 20-21 August 2014	P		2		
8. The Regional Workshop on Synthesis of Regional and National Fish Stock Enhancement Practices and Recommendations for Mitigation of Impacts, from 3-5 September 2014	P		1		
9. The 6 <sup>th</sup> Scientific Conference: Strengthening Research and Development Amidst Emerging Global Issues in Fisheries", the Philippines, 1-2 October 2014	P		1		
10. The 5 <sup>th</sup> ASEAN Tuna Working Group Meeting 29-31 October 2014	P		1		
11. The 7 <sup>th</sup> RPOA-IUU Coordination Committee, 4-6 November 2014	P		2		
12. The 37 <sup>th</sup> SEAFDEC Program Committee Meeting and 17 <sup>th</sup> ASEAN-SEAFDEC Fisheries Consultative Group, 1-5 December 2014	P	5 RFPN	2		
<b>4. Project management and coordination</b>					
1. Expenses of Staff, RFPN and administration, 2. Planning meetings, regular coordination meetings (FAO/RAP/APFIC, BOBLME, ASEAN, RPOA-IUU, WorldFish Centre, MRC, CTI-CFF, and with countries of the four sub-regions) 3. Reporting costs, editing and printing 4. Project monitoring and coordination, project mid-term review (year 3) and project evaluation (year 5) 5. Operating, equipments and maintenance expenses					

### 3.2 Output(s)

Table 6: Frame of the Output-Monitoring (for SEAFDEC Sweden refer to the Results report for 2013 check if that should be attached)

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	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 lists of achievements below are examples of how these indicators are met. The results assessment report for 2014 will be available in March 2015. The results report for 2013 is available.	
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"> <li>- Action plans developed to support the development of bi-lateral agreements.</li> <li>- Establishment of working groups of persons from concerned departments.</li> <li>- 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.</li> <li>- Integration of fisheries and habitat management and the importance of trans-boundary stocks and habitats.</li> <li>- 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.</li> </ul>	

Table 7: List of completed publications and others

List of completed publications for the year 2014	Type of media
Report of the Sub-regional Consultative Meeting on the Collaborative Fisheries Management around the North Andaman Sea/Myeik Archipelago, Phuket, Thailand, 27-28 May 2014	Report
SEAFDEC. 2014. Report of the Seminar on the Introduction of SEAFDEC-Sida Cooperation in 2013-2017, Bangkok, Thailand, 12 March 2013, Southeast Asian Fisheries Development Center. 23 pp.	Report
Report of the Consultative Meeting on Regional Cooperation for Sustainable Neritic Tuna Fisheries in Southeast Asian Waters, Songkhla Province, Thailand, 8-10 October 2013	Report
Report of the 4 <sup>th</sup> Meeting of the Gulf of Thailand Sub-region, Bangkok, Thailand, 18-19 December 2013	Report
Report of the First Technical Meeting of the Joint Working Team for Fisheries Management between Cambodia and Vietnam, Phu Quoc Island, Kien Giang Province, Vietnam, 5-7 March 2014	Report
Report of the Sub-regional Technical Meeting on the Effective Fisheries Management between Malaysia and Thailand, Penang, Malaysia, 14-15 May 2014	Report
Report of the Expert Group Meeting on Regional Plan of Action on Sustainable Utilization of Neritic Tuna Resources in the ASEAN Region, Krabi Province, Thailand, 18-20 June 2014	Report
Report of the 1 <sup>st</sup> Meeting of the Technical Working Group for Fisheries Management in Trans-boundary Areas between Cambodia and Lao PDR, Siem Reap, Cambodia, 2-4 June 2014, Southeast Asian Fisheries Development Center. 58 pp.	Report

### 3.3 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 be done at different levels, including community level, sub-regional level and the region as a whole.

### 3.4 Major Impacts/Issues

There have not really been any major negative impacts, or issues, that have hampered the project. On the positive side, there has been a successful facilitation of bi-lateral agreements, focus in fisheries sector between neighboring countries and the drafting of a Regional Plan of Action (RPOA) for Neritic Tuna. To mention a major challenge that should be the difficulty to maintain the cooperation and dialogue with partners such as BOBLME, ASEAN and MRC as we are not kept informed on developments that would be part of cooperation activities. Keeping the process going and follow-up on four sub-regions is another challenge – the key response to that would be to have one person recruited to follow each of the sub-regions. (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 IV: EVALUATION

The SEAFDEC-Sweden Project conducts the Annual Review Meeting (ARM) in every March, in the consultation with the Embassy of Sweden, Bangkok as representing Sida. During the ARM, the progress of the implementation and the annual financial report will be reported to the Meeting. The representative of Sweden will provide the comments and feedback for further improvement the performance of the project.

In addition, the external review is a requirement under the agreement with Sweden. The SEAFDEC-Sweden Project is subject to an external Mid-Term Review (MTR) in 2015. The terms of reference of the MTR indicates a thorough review of project implementation, management and results. The report of the MTR should be available by mid-2015. Pending the outcome of the MTR, there will at this stage not be any elaborated “internal” assessment of project results as indicated in Table 8 “Project Evaluation (for annual, mid-term, and end of project)”. The structure of the Swedish program (being a “special project”) incorporates several of the “activity types” listed below. The Results Assessment Framework (RAF) that are attached to the agreement with Sweden specifies annual target for each listed activity indicator and in summary the project implementation has succeeded to meet all 2014 targets.

<b>Evaluation Criteria</b>	<b>From Project Leader</b>	
	<b>Views</b>	<b>%</b>
<i>How were inputs and activities converted to results?</i>	Through cooperation with relevant regional, sub-regional, national and local partners in project implementation, including awareness-raising, facilitation of agreements between countries and capacity-building.	80%
<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>	All targets for 2014 as indicated in the RAF attached to the agreement with Sweden has been met.	90-100%
<i>Which has benefited on society and sector?</i>	The question is for the external review team to assess in 2015.	Too early to assess wait for MTR
<i>Have products and benefits been maintained?</i>	This basically a post-project assessment, but that cooperation with regional and national partners, including sub-contracts with partners for local capacity-building are steps supportive of sustainability of project results.	Too early to assess wait for MTR



**Annex 5**

**NEWS PROPOSED PROJECTS FOR THE YEAR 2015 AND ONWARDS**

<b>Program Thrust/ Project Title</b>	<b>Lead Department</b>	<b>Period</b>	<b>Appendix No.</b>
1. Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region	AQD	2015-2019	1
2. Environment-Friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources	AQD	2015-2019	2
3. Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region	MFRDMD/ TD	2015-2019	3
4. Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia	TD	2015-2019	4
5. Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia	IFRDMD	2015-2019	5
6. Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia	IFRDMD	2015-2019	6
7. Cold Chain Management of Seafood	MFRD/ AVA	2015-2017	7

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

		Project id:	
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Reinforcement and Optimization of Fish Health Management and the Effective Dissemination in the Southeast Asian Region		
<b>Program Thrust:</b>		<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines (to be confirmed)
<b>Donor/Sponsor:</b>	JTF	<b>Total Donor Budget:</b>	USD 390,938
<b>Project Partner:</b>	None	<b>Budget for 2015:</b>	USD 81,438
<b>Project leader:</b>	Takuro Shibuno AQD		

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

There is an increasing need for information dissemination and technology transfer in the Member Countries, especially to lesser developing countries, in terms of fish health management. Recently, issues relevant to the fish health management that need to be overcome have seriously affected several aquaculture farmers. For instance, the emergence of Early Mortality Syndrome (EMS) which poses a threat to 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 that useful information such as precautions of potential diseases outbreak and recommendations on appropriate fish health management are effectively disseminated to relevant stakeholders, particularly the local government unit officers, extension workers, aquaculture farmers and traders. Better understanding on the risks, impacts and management problems related to diseases is very important and an urgent matter because health management practices significantly affect product quality as well as quantity, and thus linked with the economic stability for aquafarmers and fisheries community development.

This new Project aims to: 1) develop and accelerate rapid and effective fish and shrimp health management, 2) enhance efficacy of vaccine treatment in tropical cultured species, 3) establish protective measures against persistent and emerging parasitic diseases of tropical fish, 4) identify risk factors and develop protective measures against Early Mortality Syndrome (EMS), and 5) extend & demonstrate technology to practitioners, officers, etc. of Member Countries.

### 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.

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

#### 3.1 Expected Outcomes

- Rapid and effective fish and shrimp health management will be developed and accelerated.
- Efficacy of vaccine treatment in tropical cultured species will be enhanced.
- Protective measures against persistent and emerging pathogenic fish parasites will be established.
- Protective measures against EMS in shrimp will be developed.
- Technology will be extended and demonstrated to practitioners, officers, etc. of Member Countries through training courses.

#### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Rapid and effective fish and shrimp health management will be developed and accelerated.	Output 1: Adoption and development of LAMP offers a cheaper, more rapid and convenient detection method for existing and emerging shrimp and fish pathogens.	Activity 1: Development and acceleration of rapid and effective fish and shrimp health management	<ul style="list-style-type: none"> <li>- Development and optimization of Q-PCR and LAMP methods for detection of economically important shrimp (WSSV, IHNV, MBV) and fish (VNN) virus</li> <li>- Laboratory validation of the established Q-PCR and LAMP Q-PCR and LAMP methods for detection of shrimp (WSSV, IHNV, MBV) and fish (VNN) viruses</li> <li>- Field validation of the established Q-PCR and LAMP Q-PCR and LAMP methods for detection of shrimp (WSSV, IHNV, MBV) and fish (VNN) viruses</li> </ul>
Outcome 2: Efficacy of vaccine treatment in tropical cultured species will be enhanced	Output 2: Developing and adopting methods that would enhance the efficacy of the present NNV vaccines through the use of immunoadjuvants and other substances	Activity 2: Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	<ul style="list-style-type: none"> <li>- Examination of the field efficacy of the recombinant WSSV vaccine previously developed in JTF5</li> <li>- Development and production of inactivated NNV vaccine with immunoadjuvant in vitro</li> <li>- Determination of the immunogenicity, <i>i.e.</i> onset and duration of neutralizing NNV antibodies, of the inactivated NNV vaccine with immunoadjuvant in marine fishes via injection and oral administration</li> <li>- Examination of the efficacy of inactivated NNV vaccine with immunoadjuvant via oral administration and intramuscular injection in virus-challenged fish in tanks</li> <li>- Examination of the field efficacy of inactivated NNV vaccine with</li> </ul>



			immunoadjuvant via oral administration and intramuscular injection
	Output 3: Developing and adopting methods to enhance the efficacy of present vaccines for shrimp and other antiviral approaches such as RNAi.	Activity 3: Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	<ul style="list-style-type: none"> <li>- Development and production of small interfering RNA (RNAi) molecules in vitro</li> <li>- Determination of the efficacy of RNAi treatment alone or in combination with the recombinant WSSV vaccine via oral administration and intramuscular injection in virus-challenged shrimp in tanks</li> <li>- Examination of the field efficacy of RNAi treatment alone or in combination with the recombinant WSSV vaccine via oral administration and intramuscular injection</li> </ul>
Outcome 3: Protective measures against persistent and emerging fish parasitic fish will be established	Output 4: Developing 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.	Activity 4: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	<ul style="list-style-type: none"> <li>- Identification of persistent and emerging parasites affecting net-caged and pond-reared tropical fishes</li> <li>- Examination of species diversity, morphology, life cycle and epidemiology of emerging pathogenic parasites of tropical fishes</li> <li>- Tank and field evaluation of the efficacy of novel anti-parasitic agents</li> <li>- Establishment of practical and efficient protocol for the prevention and control of persistent and emerging fish parasites</li> </ul>
Outcome 4: Protective measures against EMS in shrimp will be developed	Output 5: Developing protective measures based on the etiological agents together with identification of risk factors and protective factors.	Activity 5: Epidemiology of the Early Mortality Syndrome (EMS)	<ul style="list-style-type: none"> <li>- Identification of possible risk and protective factors through farm visits, local and abroad, during months when EMS is prevalent</li> <li>- Collection of samples from hatchery to grow-out to elucidate the possible role of hatchery protocols and pond environment in the development of EMS</li> <li>- Establishment of practical and effective methods for the prevention and control of EMS</li> </ul>
Outcome 5: Technology will be extended and demonstrated to practitioners, officers, etc. of Member Countries through training courses.	Output 6: extending and demonstrating the technologies obtained in this project to Member Countries.	Activity 6: Technology extension and demonstration	<ul style="list-style-type: none"> <li>- Implementation of training programs on specific topics based on the request from Member Countries, which necessitate the information dissemination on fish health management.</li> </ul>

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1) Development and acceleration of rapid and effective fish and shrimp health management	Viral and bacterial diseases have caused major constraints in marine finfish culture and shrimp farming in most Asian countries and in the world. With the occurrence of devastating fish viral diseases like Viral Nervous Necrosis (VNN) and Iridovirus in marine finfish, the establishment of preventive management strategies to maintain the disease-free status of fish stocks should be done. Likewise, the continued occurrence of White Spot Syndrome Virus (WSSV), Infectious Hypodermal Hematopoietic Necrosis Virus (IHHNV), Monodon baculovirus (MBV) and the emergence of Early Mortality Syndrome (EMS) necessitate the establishment of domesticated shrimp stocks that are free of these viral and bacterial pathogens. Early detection of these devastating pathogens is the most efficient response to be 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)
2) Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	The objective of the study is to develop and adopt methods that would enhance the efficacy of the present NNV vaccines through the use of immunoadjuvants and other substances that promote the activation of antiviral responses in marine fish. Methods for vaccine production for NNV will be adopted from earlier (JTF5) studies. The efficacy of vaccine containing the immunoadjuvant(s) will be tested in fish through injection or via feed encapsulation and delivered orally through feeding. Fish will be experimentally challenged with NNV after booster vaccination, as established previously. Efficacy of the vaccines will be evaluated based on relative percent survival (RPS). The expected output from the study is a practical method of delivering vaccine to fish with increased efficacy thereby preventing unwarranted outbreaks of VNN in hatcheries and grow-out culture systems. (Location: Philippines and other Member Countries concerned)
3) Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	The objective of the study is to develop and adopt methods to enhance the efficacy of present vaccines for shrimp and other antiviral approaches such as RNAi. Similar to above, methods for vaccine production for WSSV will be adopted from JTF5 studies. The delivery vehicle will be based on the results of the previous vaccination study in shrimp. In addition, recent trends utilizing RNAi as an antiviral strategy in shrimp culture will be adopted. After the shrimp have been subjected to these antiviral treatments, the shrimp will be experimentally challenged based on established procedures. Efficacy of the vaccines/ RNAi treatment will be evaluated based on RPS. The expected output from the study is a method of delivering vaccine to shrimp with increased efficacy and prevention of white spot disease by interfering with its replication in the host. (Location: Philippines and other Member Countries concerned).
4) Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	The primary goal of this study is to develop practical strategies that could be adopted by farmers to address the pressing problem on mass mortalities of net-caged and pond reared fishes attributed to persistent and emerging fish parasites. The efficacy of new anti-parasitic agents in consonance with good aquaculture practices will be examined. In addition, the species diversity, morphology and life cycle, and epidemiology of emerging parasites in both marine and freshwater fishes will be investigated. Once pertinent data are generated, prevention and control measures

	against these parasites could be instituted.
5) Epidemiology of the Early Mortality Syndrome (EMS)	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, Vietnam, 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).
6) Technology extension and demonstration	To make the fish health management effective and functional and to guarantee the sustainable development of aqua food production together with the poverty alleviation in our region, the efforts to extend and demonstrate the technologies obtained in this project to Member Countries are very significant. Not only the knowledge and technologies are delivered but a follow-up survey is also implemented to facilitate the dissemination so that information will effectively reach to aqua-farmers, fish health managers, LGU officers, etc. (Location: Member Countries concerned).

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

Table 3 Proposed Budget based on activity and sub-activity 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	10,500	10,000	9,000	8,000
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	10,500	10,000	9,000	8,000
	Sub-activity 2.2: Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	11,000	10,500	10,000	9,000	8,000
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish		11,000	10,500	10,000	9,000	8,000

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 4: Epidemiology of the Early Mortality Syndrome (EMS)		11,000	10,500	10,000	9,000	8,000
Activity 5: Technology extension and demonstration		15,000	15,000	15,000	15,000	15,000
Activity 6: Publication						6,000
Activity 7: Annual progress meeting and international workshop	Sub-activity 7.1: Annual progress meeting	5,000	5,000	5,000	5,000	5,000
	Sub-activity 7.2: International workshop					12,000
Activity 8: Coordination by the project leader		6,000	6,000	6,000	6,000	6,000
<b>Sub-Total</b>		<b>81,438</b>	<b>78,500</b>	<b>76,000</b>	<b>71,000</b>	<b>84,000</b>

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Activity 1: Development and acceleration of rapid and effective fish and shrimp health management	Jan.-Dec.	-Updated inf.	I. Research and Development activities	11,000
Sub-Activity 2.1: Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	Jan.-Dec.	-Updated inf.	I. Research and Development activities	11,000
Sub-Activity 2.2: Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	Jan.-Dec.	-Updated inf.	I. Research and Development activities	11,000
Activity 3: Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	Jan.-Dec.	-Updated inf.	I. Research and Development activities	11,000
Activity 4: Epidemiology of the Early Mortality Syndrome (EMS)	Jan.-Dec.	-Updated inf.	I. Research and Development activities	11,000
Activity 5: Technology extension and demonstration	Oct.	-SEAFDEC MC's required -Updated inf.	II. Training activities:	15,000
Sub-Activity 7.1: Annual progress meeting	Dec.	-Expert on specific issues from Ph. and Japan	VI. Others:	5,000
Activity 8: Coordination by the project leader	Jan.-Dec.	-SEAFDEC MC's required -Updated inf.	VI. Others:	6,000

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

		Project id:	
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Environment-Friendly, Sustainable Utilization and Management of Fisheries and Aquaculture Resources		
<b>Program Thrust:</b>		<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	AQD	<b>Lead Country:</b>	Philippines (to be confirmed)
<b>Donor/Sponsor:</b>	JTF	<b>Total Donor Budget:</b>	USD 363,500
<b>Project Partner:</b>	<i>None</i>	<b>Budget for 2015:</b>	USD 79,000
<b>Project leader:</b>	Takuro Shibuno AQD		

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

So far, 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 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. One of the most important missions of SEAFDEC/AQD is to transfer latest technologies and information on aquaculture to ASEAN Member Countries through training courses. This Project is being proposed to: 1) Establish environment-friendly, responsible aquaculture technology Nature-conscious culture technologies guaranteeing environment-friendliness. 2) Promote community-based production and resource enhancement of high-value aquatic resources. 3) Disseminate and demonstrate resource enhancement practices.

### 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, that is, Indonesia, Vietnam, 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.

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

#### 3.1 Expected Outcomes

- Establish environment-friendly, responsible aquaculture technology
- Promote community-based production and resource enhancement of high-value aquatic resources to secure the livelihood with avoiding rampant, illegal fishing and social conflicts.
- Technology extension and demonstration

#### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Establish environment-friendly, responsible aquaculture technology	Output 1: Exploration of plant-origin aquafeed ingredients, that are available in the region, for cultured freshwater fish species	Activity 1: Use of plant-based protein sources in tilapia feeds for improved production traits	<ul style="list-style-type: none"> <li>- 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</li> <li>- Assessment on the effect of refined formulated diets on growth, reproductive performance, nutrient excretion and health condition of cultured species</li> <li>- Testing of refined formulated diets in cages and pond culture systems using improved feeding management scheme</li> </ul>
	Output 2: Developing ecosystem-based pond management strategies through aquasilviculture	Activity 2: Responsible aquaculture through aquasilviculture	<ul style="list-style-type: none"> <li>- Investigation on the culture of <i>P. monodon</i> with finfish inside pen in ponds with adjacent mangrove stocked with mudcrab</li> <li>- Feasibility of the culture of <i>P. monodon</i> in pens inside ponds with mangrove</li> </ul>
Outcome 2: Promote community-based production and resource enhancement of high-value aquatic resources to secure the livelihood with avoiding rampant, illegal fishing and social conflicts.	Output 3: Maintaining 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	Activity 3: Community-based integrated production of abalone <i>Haliotis asinina</i> and sea cucumber <i>Holothuria scabra</i> through culture, sea ranching and stock enhancement	<ul style="list-style-type: none"> <li>- Improving fisheries governance and strategies for managing enhanced abalone and sandfish stocks and health of its habitat</li> <li>- Ensuring supply of natural food, seeds, feeds and other inputs in the production; and assuring markets for processed high-value abalone and sandfish products</li> <li>- Improving organizational, management and entrepreneurial skills of fishers to sustain livelihoods from production, sea ranching and stock enhancement high-value aquatic products</li> </ul>

	Member Countries		
	Output 4: Developing appropriate transport and acclimation strategies of seahorses from the hatchery to the release site	Activity 4: Promotion of resource enhancement of seahorses	<ul style="list-style-type: none"> <li>- Establish the appropriate transport and acclimation strategies of seahorses from the hatchery to the release site (<i>e.g.</i> appropriate size of seahorses for release, appropriate time of release, etc.) to ensure optimum conditions for the survival of animals.</li> <li>- Develop appropriate monitoring strategies of the released seahorses.</li> <li>- 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</li> </ul>
Outcome 3: Technology extension and demonstration	Output 5: Extension and demonstration on the breeding, hatchery seed production, nutrition and health management in grouper, seabass, snapper <i>etc.</i>	Activity 5: Marine fish hatchery training program	<ul style="list-style-type: none"> <li>- Technology and information transfer on resource enhancement practice through training</li> </ul>
	Output 6: Training focusing on promotion of community-based freshwater aquaculture for remote rural areas of Southeast Asia	Activity 6: Rural aquaculture program	<ul style="list-style-type: none"> <li>- Technology and information transfer on resource enhancement practice through training</li> </ul>

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1) 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.
2) Responsible aquaculture through aquasilviculture	Ecosystem-based pond management strategies will be developed using shrimp, mud crab, milkfish <i>etc.</i> as the target culture species through aquasilviculture. Microorganisms 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 improves water quality. Improved water quality in the coastal areas translates to better influent water thereby eliminating water quality-related risk factors for disease occurrence. Milkfish or other finfish such as tilapia grouper, seabass or siganid will be stocked in net pens inside the shrimp pond. Shrimp pond effluent will be drained into mangrove areas stocked with mud crab. Rich nutrition included in the pond effluent discharged in coastal areas is utilized at the maximum for promotion of sustainable production.

Activity	Description
3) 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.
4) 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.
5) 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>
6) 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.

### 3.4 Activity, Sub-activity and Proposed Budget for 2015-2019

Table 3 Proposed Budget based on activity and sub-activity 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	10,500	10,000	9,000	8,000
	Sub-activity 1.2: Responsible aquaculture through aquasilviculture	11,000	10,500	10,000	9,000	8,000



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	20,000	17,000	16,000	15,000
	Sub-activity 2.2: Promotion of resource enhancement of seahorses	11,000	10,500	10,000	9,000	8,000
Activity 3: Technology extension and demonstration	Sub-activity 3.1: Marine fish hatchery training program	8,000	8,000	8,000	8,000	8,000
	Sub-activity 3.2: Rural aquaculture program	9,000	9,000	9,000		
Activity 4: Publication						6,000
Activity 5: Annual progress meeting and international workshop	Sub-activity 5.1: Annual progress meeting	5,000	5,000	5,000	5,000	5,000
	Sub-activity 5.2: International workshop				12,000	
Activity 6: Coordination by the project leader		4,000	4,000	4,000	4,000	4,000
	<b>Sub-Total</b>	<b>79,000</b>	<b>77,500</b>	<b>73,000</b>	<b>72,000</b>	<b>62,000</b>

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 3. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Sub-Activity 1.1 Use of plant-based protein sources in tilapia feeds for improved production traits	Jan.-Dec.	-Updated inf.	I. Research and Development activities	11,000
Sub-Activity 1.2 Responsible aquaculture through aquasilviculture	Jan.-Dec.	-Updated inf.	I. Research and Development activities	11,000
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	Jan.-Dec.	-Updated inf. -Local fisherfolk, government/LGU's required.	I. Research and Development activities	20,000
Sub-Activity 2.2: Promotion of resource enhancement of seahorses	Jan.-Dec.	-Updated inf.	I. Research and Development activities	11,000
Sub-Activity 3.1: Marine fish hatchery training program	Jun.-Jul.	-SEAFDEC MC's required -Updated inf.	II. Training activities:	8,000
Sub-Activity 3.2: Rural aquaculture program	Oct.-Nov.	-SEAFDEC MC's required -Updated inf.	II. Training activities:	9,000

<b>Sub-Activity</b>	<b>Timeframe/ period</b>	<b>Inputs</b>	<b>Type of Activity</b>	<b>Proposed Budget</b>
Sub-Activity 5.1: Annual progress meeting	Dec.	-Expert on specific issues from Ph. and Japan	VI. Others:	5,000
Activity 6: Coordination by the project leader	Jan.-Dec.	-SEAFDEC MC's required -Updated inf.	VI. Others:	4,000

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 04201303			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Research for Enhancement of Sustainable Utilization and Management of Sharks and Rays in the Southeast Asian Region		
<b>Program Thrust:</b>	IV	<b>Total Duration:</b>	2015 - 2019
<b>Lead Department:</b>	MFRDMD	<b>Lead Country:</b>	Indonesia (to be confirmed)
<b>Donor/Sponsor:</b>	JTF	<b>Total Donor Budget:</b>	USD 218,960
<b>Project Partner:</b>	None	<b>Budget for 2015:</b>	USD 43,792
<b>Project leader:</b>	Mr. Ahmad Ali		

## 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 the importance of sharks and rays in the Southeast Asian region and necessity of fisheries management measures. MFRDMD will be the responsible Department for this project, and will manage and coordinate all project activities. The project involves five-day workshops on identification of sharks and rays in the region in 2016 and 2019, DNA data/information collection on identification of shark and ray species in the region and information collection on utilization of sharks and rays for fishery management in the region.

### 2. Background and Justification

This project was recommended during the Regional Workshop on Data Collection Methodology for the Assessment of Shark Stock Status convened in Bangkok, Thailand from 23 - 25 October 2013. Outcome from this project will support SEAFDEC Member Countries in Southeast Asian region in their conservation and management of resources and as well as for utilization at sustainable level. Several sites were identified according to major landing site at each strategic geographical location. For Andaman Sea (Myanmar, Thailand and Indonesia); Gulf of Thailand and South China Sea (Thailand, Malaysia, and Vietnam); and Sulu Sulawesi Seas (Malaysia and Philippines). Data collection will focus on dominant species at those particular sites along with three species of hammerhead sharks and all manta rays listed in Appendix II CITES and all three species of thresher sharks protected under IOTC.

This project corresponds 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

This Project is being proposed with the aim;

- 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;
- 2) To obtain/summarize genetic information for shark and ray species identification in the region by DNA bar-coding; and
- 3) To collect information on utilization of sharks and rays in the region for proper fishery management and sustainable utilization.

#### 3.1 Expected Outcomes

- 1) Trained staffs are able to make the right and valid identification of species. Training materials stored electronically and easy to excess.
- 2) Regional report on DNA barcoding of sharks and rays species in the region published.
- 3) Confirmed earlier report in current NPOA-Sharks that all sharks and rays are landed whole fully utilized with no finning activities on board vessels.

#### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
<b>Outcome 1:</b> Improved data collection on sharks and rays in participating Member Countries	Output 1: Trained personnel and DNA data in shark and ray taxonomy	Activity 1: Identification of Sharks and Rays in the Southeast Asian Region	<ul style="list-style-type: none"> <li>- One on-site training for each selected Member Country.</li> <li>- Number of individuals trained for taxonomy.</li> <li>- A report on landing of sharks and rays species listed in CITES up to species level from pilot project sites.</li> <li>- Improved research methodology for tissue sample collection and preservation of sharks and rays for DNA bar-coding.</li> <li>- Regional report on DNA barcoding of shark and ray species in the region</li> </ul>
Outcome 2: Confirmation of proper landing and handling of sharks and rays for full utilization without finning activity from fishing vessels	Output 2: Information on usage and marketing of the landed sharks and rays will be obtained from the pilot project sites	Activity 2: Utilization of By-catch Sharks and Rays	<ul style="list-style-type: none"> <li>- Number of countries visited by MFRDMD for data collection on utilization of by-catch sharks and rays.</li> <li>- A report on information of the percentages of sharks and rays from the total landing at pilot project sites.</li> </ul>

### 3.3 Overall Scope/Description of Project:

Table 2: Overall project description for activity

Activity	Description
1) Identification of Sharks and Rays in the Southeast Asian Region	<p>MFRDMD researchers will visit selected SEAFDEC Member Countries to assist data collection on sharks and rays. On-site training will help to identify the problems associated with identification of sharks and rays at selected landing sites. Shark and ray experts from MFRDMD and Member Countries will find the solutions for taxonomic data collection at the landing sites.</p> <p>MFRDMD will continue to compile and collect genetic information on sharks and rays as an alternative identification method. Currently barcoding research on sharks is progressing in the world. MFRDMD will conduct genetic research on some of the un-sequenced shark and ray species using the DNA barcoding method. Tissue samples for the DNA study will be collected not only by MFRDMD but also by SEAFDEC Member Countries.</p>
2) Utilization of By-catch Sharks and Rays	MFRDMD will visit selected SEAFDEC Member Countries to collect information on utilization of by-catch sharks and rays. Local fishery officers and external experts in this field will assist this activity. Collected information will be compiled and published as reference materials to be utilized by SEAFDEC Member Countries for better fishery management and sustainable utilization of sharks and rays in the region.

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

Table 3 Proposed Budget based on activity and sub-activity 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		33,792			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	
<b>Sub-Total</b>		<b>43,792</b>	<b>43,792</b>	<b>43,792</b>	<b>43,792</b>	<b>43,792</b>

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)				
Sub-Activity	Timeframe/ period	Inputs <sup>1</sup>	Type of Activity	Proposed Budget
Sub-Activity 1.1 On-site training in the region	Jan-Dec	Expertise, reference materials and specimens	Training activities	18,400
Sub-activity 1.3 Identification of shark and ray species by DNA bar-coding	Jan-Dec	Expertise, equipment, reference materials and specimens	Research and Development activities	18,900
Sub-Activity 2.1: County visits	Jan-Dec	Expertise and reference materials	Information activities	6,492
<b>Total</b>				<b>43,792</b>

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

#### 5.1 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 (USD)
		MCs	SEAFDEC	Others	

#### 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Output 1: Trained personnel and DNA data in shark and ray taxonomy	(A) One on-site training for each selected Member Country		
	(B) Number of individuals trained for taxonomy		
	(C) A report on landing of shark and ray species listed in CITES up to the species level from pilot project sites		
	(D) Improved research methodology for tissue sample		

<sup>1</sup> The financial, human, material, technological and information resources used for development interventions

	collection and preservation of sharks and rays for DNA bar-coding		
	(F) Regional report on DNA barcoding of shark and ray species in the region		
Output 2: Information on usage and marketing of the landed sharks and rays will be obtained from the pilot project sites	(G) Number of countries visited by MFRDMD for data collection on utilization of by-catch sharks and rays		
	(H) A report on information of the percentages of sharks and rays from the total landing at pilot project sites		

Table 7 List of completed publications and others

<b>List of completed publications for the year 2014</b>	<b>Type of media</b>	<b>attached e-file</b>
1. Standard Operating Procedure for Tissue Sample Collection and Preservation of Sharks and Rays.	Book	MFRDMD website
2. Field Guide to Rays, Skates and Chimaeras of the Southeast Asian Region	Book	MFRDMD website
3. Ahmad, A. and Annie Lim, P.K. 2014. Chondrichthyan Biodiversity in Malaysia. Paper presented at Asian Fish Biodiversity Conference 2014, 12-13 February 2014, Penang, MALAYSIA.	Proceeding conference	MFRDMD website
4. Ahmad, A., Annie Lim, P.K., Fahmi, Dharmadhi and Krajangdara, T. 2014. Chondrichthyan Biodiversity in the Southeast Asian Region. Paper presented at Asian Fish Biodiversity Conference 2014, 12-13 February 2014, Penang, MALAYSIA.	Proceeding conference	MFRDMD website
5. Katoh, M., Ahmad, A., Dharmadhi, Fahmi, Vidthayanon, C. and Annie Lim, P.K. 2014. Habitat preferences of chondrichthyans in Malaysia, Indonesia and Thailand. Paper presented at the annual meeting of the Ichthyological Society of Japan, 15-16 November, Odawara, Kanagawa, JAPAN	Abstract	

### 5.3 Project Outcomes and Lesson Learned

Supporting technical staff very limited due to many project involved. Need to hire a contract officer with a degree in biotechnology.

### 5.4 Major Impacts/Issues

Genetic analysis takes time due to limited number of staff.

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015**

Project id: 04201501			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of Sustainable Fisheries Resources Enhancement Measures in Critical Habitats/Fishing Grounds in Southeast Asia		
<b>Program Thrust:</b>		<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	Thailand (to be confirmed)
<b>Donor/Sponsor:</b>	Japanese Trust Fund	<b>Total Donor Budget:</b>	USD 317,500
<b>Project Partner:</b>	<i>None</i>	<b>Budget for 2015:</b>	USD 63,500
<b>Project leader:</b>	T. Yuttana/SCFDH/TD		

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

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

The expected outputs for the project include development of strategies and guidelines for implementing resources enhancement program to promote sustainable fisheries resources enhancement measures, developing human resources in ASEAN Member States for the implementation of resources enhancement programs.

### 2. Background and Justification

The program for the first year involves development of diagnoses of critical habitats/fishing grounds and evaluation of resources enhancement practices, technical assistance led by pilot project sites for suitable resources enhancement practices and information dissemination on rehabilitation of fisheries resources and habitat/fishing grounds in ASEAN Region.

The expected outputs for the project include development of strategies for implementing resources enhancement program to promote sustainable fisheries resources enhancement, and development of human resources in ASEAN member countries for the implementation of resources enhancement programs.

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

#### 3.1 Expected Outcomes

- 1) Gathering information on fisheries resources enhancement and habitat conservation measures in Southeast Asia
- 2) Disseminating and promoting fisheries resources enhancement and habitat conservation measures suitable for Southeast Asia
- 3) Human resources development for implementation of fisheries resources enhancement and habitat conservation measures



### 3.2 Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Information gathering on fisheries resources enhancement and habitat conservation measures in Southeast Asia	Output 1: Available of Information on fisheries resources enhancement and habitat conservation measures in Southeast Asia	Activity 1: Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices	At least one exclusive summary / report(s) on the status of fisheries resources enhancement and habitat conservation measures in Southeast Asia.
Outcome 2: Disseminating and promoting fisheries resources enhancement and habitat conservation measures suitable for Southeast Asia	Output 2: Cultivating understanding on tools and methods on rehabilitation of fisheries resources and habitats/ fishing grounds to ASEAN Member States	Activity 2: Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds	- At least one exclusive summary / report(s) on the result of fisheries resources enhancement and habitat conservation in pilot project site.  - Awareness publications and articles related to the results from project.
	Output 3: Strengthen Information dissemination on rehabilitation of fisheries resources and habitats/ fishing grounds for public awareness	Activity 3: Promotion and extension on rehabilitation of fisheries resources and habitats/ fishing grounds in ASEAN Region	A series of sustainable fisheries resources enhancement measures in critical habitats/fishing grounds in Southeast Asia guidelines/ handbooks in multi-lingual will be produced and disseminated to the ASEAN Member States.
Outcome 3: Human resources development for implementation of fisheries resources enhancement and habitat conservation measures	Output 4: Strengthen knowledge and skill of ASEAN Member States on suitable measures for sustainable fisheries resources enhancement and habitat conservation	Activity 2: Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds	At least two regional training program on suitable measures for sustainable fisheries resources enhancement and habitat conservation were conduct for ASEAN Member States.

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1) Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices	Investigation of the existing basic information and research works in identifying the critical fishing grounds as well as spawning and nursery grounds known also as “Fishery <i>Refugia</i> ” for commercial fishes including bottom and pelagic species, will be conducted. Information collection would be conducted through deskwork and visit to the Member Countries. The results of the information gathering will be used for mapping and assessment by indices of the status of the critical fishing grounds in the region.  Investigation of existing information and research works on the effective designs/models and methodologies for the resource enhancement tools/practices used in various fisheries habitat will be conducted. Information collection would be

	<p>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>
2) Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds	<p>In this activity, selected onsite study and evaluation on enhancement practices including artificial reefs impact to fisheries resources and environment are conducted in selected pilot project site of Member Countries.</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. 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>
3) Promotion and extension on rehabilitation of fisheries resources and habitats/ fishing grounds in ASEAN Region	<p>Documentation of the best practices of the project implementation will be carry out, which can be used as inputs in the preparation of IEC (information, education and communication) materials for dissemination in the region.</p> <p>The regional seminar is primarily aimed at reviewing the impact of project and disseminating the modality of the project operation and resultant outcomes to other SEAFDEC Member Countries. The project activities and its outcomes during its 4.5 years' implementation are described in detail by the responsible parties. In addition, the impacts of the respective activity and expected follow-up actions after the termination of the project are also highlighted.</p>

### 3.4 Activity, Sub-activity and Proposed Budget for 2015-2019):

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 1: Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices	Sub-activity 1.1 Investigation/review of the status of critical habitats/fishing grounds in the Southeast Asian region	5,360	5,360	5,360	5,360	0
	Sub-activity 1.2 Information collection on suitable designs of resource enhancement practices including their evaluation and promotion	2,780	2,780	2,780	2,780	2,500
	Sub-activity 1.3 Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation	16,500	0	16,500	0	0

Activity	Sub-Activity	Y1 2015	Y2 2016	Y3 2017	Y4 2018	Y5 2019
Activity 2: Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds	Sub-activity 2.1: Technical assistance in a pilot site for suitable designs of resource enhancement practices	10,000	8,840	10,000	8,840	10,000
	Sub-activity 2.2: Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management	27,860	27,860	27,860	27,860	27,860
	Sub-activity 2.3: Capacity building on theory and methodology of fisheries resource enhancement and habitat conservation measures	0	18,160	0	18,160	0
Activity 3: Promotion and extension on rehabilitation of fisheries resources and habitats/ fishing grounds in ASEAN Region	Sub-activity 3.1: Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness	1,000	500	1,000	500	2,000
	Sub-activity 3.2: End of project regional seminar	0	0	0	0	21,140
<b>Sub-Total</b>		<b>63,500</b>	<b>63,500</b>	<b>63,500</b>	<b>63,500</b>	<b>63,500</b>

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs <sup>1</sup>	Type of Activity	Proposed Budget
Sub-Activity 1.1: Investigation/review of the status of critical habitats/fishing grounds in the Southeast Asian region	Jan. – Dec.	- Updated information - Expert consultation and MCs visit	III. Information activities	5,360
Sub-Activity 1.2: Information collection on suitable designs of resource enhancement practices including their evaluation and promotion	Jan. – Dec.	-Updated information	III. Information activities	2,780
Sub-Activity 1.3: Workshop/Expert consultation on suitable measures for sustainable fisheries resource enhancement and habitat conservation	Oct. – Nov.	-Resource persons/ expert on specific issues from MCs and organization	IV. Policy development activities	16,500
Sub-Activity 2.1: Technical assistance in a pilot site for	Mar. – Jul.	- onsite study and	I. Research and	10,000

<sup>1</sup> The financial, human, material, technological and information resources used for development interventions

suitable designs of resource enhancement practices		investigation for appropriate methodology	Development activities	
Sub-Activity 2.2: Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management	Feb. – Aug.	- onsite study and investigation for appropriate methodology	I. Research and Development activities	27,860
Sub-Activity 3.1: Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness	Jan. – Dec.	-Updated information	III. Information activities	1,000
				<b>63,500</b>

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: 05201501
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Enhancement of Sustainability of Catadromous Eel Resources in Southeast Asia		
<b>Program Thrust:</b>		<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	IFRDMD	<b>Lead Country:</b>	Indonesia (to be confirmed)
<b>Donor/Sponsor:</b>	JTF	<b>Total Donor Budget:</b>	
<b>Project Partner:</b>	TBA	<b>Budget for 2015:</b>	USD 210,000
<b>Project leader:</b>	TBA		

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

This Project titled “Enhancement of sustainability of catadromous eel resources in Southeast Asia” is being proposed to aim at:

- Having clear understanding on current situation of resources, fisheries and utilization of catadromous eels in Southeast Asia
- Improving data collection and statistics of catadromous eel catch in ASEAN Member States
- Enhancing knowledge and capacity of ASEAN Member States for conservation, management and sustainable utilization of catadromous eel resources

### 2. Background and Justification

The freshwater eels (*Anguilla spp*: Anguillidae) are popular as a commercial important food, because of their good nutritional value with protein and fat contents of 65% and 28%, respectively (Hainsbroek 2007). These fish are also well known for their unique catadromous life history. This species breed far from offshore after migrating thousands of kilometers from their growth habitats in freshwater and estuaries to their spawning areas in oceanic waters. However, most of the investigations on eels were focused on temperate species, in the northern hemisphere mainly because of the economic importance of these species such as *A. japonica*, *A. anguilla* and *A. rostrata*.

The international market for cultured eels exceeds 200,000 tons in year 2000. Based on FISHSTAT data, the total production of eels rose from 17,750 tons in 1950 year to 284,274 tons in 2007 year (FAO 2009). In Japan, the Japanese eel (*Anguilla japonica*) has long been esteemed as an important food fish, as much as 130,000 tons of eels are consumed per year. However most of this production is based on exploitation of wild adults and rearing of wild-caught juvenile “glass eels”. The capture activity of glass eels since the mid-1990s has increased rapidly.

Currently, the population of temperate eels dramatically decrease caused by habitat destruction, illegal fishing and climatic changes. As a result, tropical eels become important in the market, as well as the research on tropical eels become a new challenge. Since Ege (1939) conducted incredible taxonomic study on the adult *Anguilla* eels around the world and after Jespersen (1942) conducted a historical research on the larvae of *Anguilla* eels around Indo Pacific (tropical area) then Indonesian Waters became recognized as the center for eel biodiversity in the world. On the other hand, the knowledge on tropical eel species occupying southern or tropical zones is still limited.

Since the eel populations in the temperate zone is diminished due to demand of glass eel from Indonesian waters increased significantly. Thus, capture activity of glass eel also rise dramatically that ensued almost

along the south coast of Java island, west coast of Sumatra and Sulawesi waters. Based on interviews with seed collector, the estimated of potential of Indonesian seed eel more than 10 tons per year (around 2 tons for *A. bicolor* and 8 tons for *A. marmorata*). In order to avoid the over exploitation of glass eel, the Indonesian government issued the regulation to prohibit export of eel seed less than 150 g from Indonesia's territory. The policy to prohibit export of eel seeds have been stipulated through Ministerial Decree since 1973 *i.e.* KepMentan No 214/Kpts/Um/V/1973 concerning the prohibition export some species of fish seed which one of them is eel's seed. In 2009, the decree to prohibit export of eel seed renewed except for research purposes. Further, in 2012 the decree is updated with more conservative to the eel that prohibit exporting of seed eel for any reason. The similar policy to prohibit of eel seed export from a territory is also found in some countries, such as Ireland (Europe) and Philippine (Asia).

As the impact of the export ban on eel seeds, some farming activities started to develop in Indonesia. Since 2009 some Indonesian farmers is starting to conduct aquaculture activity with simple technology application, and in same time some foreign companies also started to invest on eels aquaculture by advanced technology application.

Currently eel conservation and management policy issues to sustainability of resources that have high economic and strategic value become fundamental not only in Indonesia but also in Southeast Asia region. Therefore, Southeast Asia region need a policy to balance between utilization and sustainability of the eel resources.

The Inland Fishery Resources Development and Management Department (IFRDMD) of SEAFDEC as a new Department will be responsible for this project and will manage and coordinate all project activities.

The main objectives of present project are to find out the current status of eel fisheries, development of collection methods and statistical data on fisheries production, and promotion of management plan for eel conservation and sustainable use.

The Goal of the project is construction of a guideline on conservation, management and sustainable utilization of catadromous eel resources in Southeast Asia region.

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

#### 3.1. Expected Outcomes

- 1) Enhanced regional understanding in management of catadromous eel resources.
- 2) Improvement of eel fisheries data collection
- 3) Promoting the sustainable management of eel resources

#### 3.2. Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Enhanced regional understanding in management of catadromous eel resources.	<ul style="list-style-type: none"> <li>- Workshop to exchange information on catadromous eels in Southeast Asia</li> <li>- Survey on trends of catadromous eel fisheries including glass eel catch</li> <li>- Survey on commercial distribution/trade of catadromous eels including glass eel</li> </ul>	Activity 1. Clear understanding on current situation of resources, fisheries and utilization	<p>Participation by at least 11 ASEAN-SEAFDEC Member Countries.</p> <p>Report on regional understanding in management of catadromous eel resources.</p>

<p>Outcome 2: Improvement of eel fisheries data collection</p>	<ul style="list-style-type: none"> <li>- Study on catadromous eel species identification by DNA technology</li> <li>- Study on statistical data collection methodologies</li> <li>- Workshop to develop statistical data collection methodologies</li> </ul>	<p>Activity 2. Improvement of data collection and statistics on eel fisheries</p>	<p>Invite eel expert to assist in the improving data collection system by DNA Technology and statistical methodologies.</p> <p>Participation by at least 11 ASEAN-SEAFDEC Member Countries.</p>
<p>Outcome 3: Promoting the sustainable management of eel resources</p>	<ul style="list-style-type: none"> <li>- Study on elements negatively impacting catadromous eel resources and mitigating measures</li> <li>- Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources</li> <li>- Workshop to develop policy recommendation on the sustainability of catadromous eel resources in Southeast Asia</li> </ul>	<p>Activity 3. Promotion of conservation, management and sustainable utilization</p>	<p>Policy recommendation on conservation, management and sustainable utilization of catadromous eel resources</p> <p>Participation by at least 11 ASEAN-SEAFDEC Member Countries.</p>

### 3.3. Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1). Workshop to exchange information on catadromous eels in Southeast Asia	- Workshops will be held in South East Asia Countries, participate by eel experts for sharing and exchanging information on catadromous eels in South East Asia. It will be carried out in 2015.
2). Survey on trends of catadromous eel fisheries including glass eel catch	- Survey on eels fisheries will be conducted in Indonesia, Philippine and Thailand to find out trends and intensity of eel capture including glass eel catch. The survey will be carried out during the years of 2015 to 2017.
3). Survey on commercial distribution/trade of catadromous eels including glass eel	- Survey on commercial distribution and trade will also be conducted during 2015 to 2017 in Indonesia, Philippine and Thailand to find out the status of eel trade and market in ASEAN Member States.
4). Study on catadromous eel species identification by DNA technology	- Scientific study on taxonomy of eel will conducted in Indonesia, Philippine and Thailand to identify species variation among <i>Anguilla</i> sp base on DNA technology. This activity will be carried out during years of 2015 to 2017.
5). Study on statistical data collection methodologies	- Development of data collection methodologies will also be carried out by the project. The study on data collection methodologies will be conducted during 2016-2017.
6). Workshop to develop statistical data collection methodologies	- Workshop to develop statistical data collection methodologies base on the 2016 study and collected data by the project will be held in Indonesia and Thailand in 2018.

7). Study on elements negatively impacting catadromous eel resources and mitigating measures	- To find out negative impact of environmental change on catadromous eel resources scientific study will be conducted in several waters system in Indonesia, Philippine, and Thailand during the years of 2017 to 2019. Mitigating measures will be carried out in selected areas according to the level of impact.
8) Develop guidelines on conservation, management and sustainable utilization of catadromous eel resources	- Product of four years project activities will be compiled as guidelines on conservation, management and sustainability utilization of catadromous eel resources. It will be constructed in 2018.
9) Workshop to develop policy recommendation on the sustainability of catadromous eel resources in Southeast Asia	- At the end of the project (2019), a Workshop will be held with the aim to disseminate the outcomes of the activities in this project and develop a policy recommendation on sustainability of catadromous eel resources in Southeast Asia

### 3.2 Activity, Sub-activity and Proposed Budget for 2015-2019

Table 3 Proposed Budget based on activity and sub-activity for 2015-2019

(Unit: US\$)

Activity	Y1 2015	Y2 2016 <sup>1</sup>	Y3 2017 <sup>2</sup>	Y4 2018 <sup>3</sup>	Y5 2019 <sup>4</sup>
Activity 1: Clear understanding on current situation of resources, fisheries and utilization	34,000	21,000	16,000	-	-
Activity 2: Improvement of data collection and statistics on eel fisheries	8,000	21,000	16,000	16,000	-
Activity 3: Promotion of conservation, management and sustainable utilization	-	-	10,000	26,000	42,000
<b>Sub-Total</b>	<b>42,000</b>	<b>42,000</b>	<b>42,000</b>	<b>42,000</b>	<b>42,000</b>

## PART II: PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Activity including inputs, period, estimated budget for 2015

(Unit: US\$)

Activity	Timeframe/ period	Inputs	Type of Activity	Proposed Budget
Activity 1: Clear understanding on current situation of resources, fisheries and utilization	2 <sup>nd</sup> Qtr (2 days) for workshop 2 <sup>nd</sup> to 4 <sup>th</sup> Qtr for survey	-	IV. Policy development activities	34,000
Activity 2: Improvement of data collection and statistics on eel fisheries	1 <sup>st</sup> to 4 <sup>th</sup> Qtr	-	IV. Policy development activities	8,000

<sup>1</sup>Not allocated as yet

<sup>2</sup>Not allocated as yet

<sup>3</sup>Not allocated as yet

<sup>4</sup>Not allocated as yet



**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 05201502			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Promotion of Responsible Utilization of Inland Fisheries in Southeast Asia		
<b>Program Thrust:</b>		<b>Total Duration:</b>	2015-2019
<b>Lead Department:</b>	IFRDMD	<b>Lead Country:</b>	Indonesia (to be confirmed)
<b>Donor/Sponsor:</b>	JTF	<b>Total Donor Budget:</b>	USD 325,190
<b>Project Partner:</b>	TBA	<b>Budget for 2015:</b>	USD 65,038
<b>Project leader:</b>	TBA		

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

This Project titled “Promotion of responsible utilization of inland fisheries resources in Southeast Asia” is being proposed to aim at:

- 1) Reviewing activities and methodologies for promoting inland fisheries in ASEAN Member Countries and find a way forward for sustainable development of inland fisheries
- 2) Promoting effective inland fisheries management measures in ASEAN Member States
- 3) Studying and developing Habitat Conservation / Resources Enhancement measures suitable for Southeast Asia

### 2. Background and Justification

Inland fisheries are an important component of the economies of many the region countries. It creates employment and income, and serves as a source of food supply. This contribution is particularly important in poverty alleviation, food security and nutritional well-being of many rural communities, particularly in the developing countries, as well as the low income food deficit countries.

The sustainability of inland capture fisheries is very much dependent on the quality of aquatic habitats and ecosystems. However, fishery is not the only sector that dependent on the inland ecosystems, as the same ecosystems also provide wide ranges of products and services for people living adjacent to the areas. These resulted in competition/conflicts among resource users with different interests, *e.g.* fisheries, irrigation for agriculture, forestry, transport, tourism and development opportunities, including hydropower. Initiatives have been undertaken by the fisheries-related sectors in conservation and management of the aquatic ecosystems in order to enhance inland fisheries production to sustain the livelihood of people living in the areas. However, with the unavailability of reliable data and information on the importance of inland fisheries, the sub-sector is hence overlooked by planners and policy makers, and given low priority comparing to the other development sectors sharing the same water resources, resulting in management decision that may create negative impacts to the sub-sector.

In order to improve the awareness on inland fisheries and enhance the better conservation and management of the ecosystems for the sustainability of inland fisheries, it is therefore necessary for countries in the Southeast Asian region to improve data collection of inland fisheries. There is also a need to enhance governance for sustainable inland fisheries through the application of ecosystem approach to fisheries, as well as co-management in order to appropriately integrate inland fisheries management with habitat management, and enhance the involvement of local community and relevant stakeholders in the process of planning, management and conservation of the inland aquatic habitat/resources.

Considering the above conditions, SEAFDEC/IFRDMD will manage and coordinate all project activities. The program of Promotion of responsible utilization of inland fisheries resources in Southeast Asia is a way to establish and strengthen regional networking for improving the fisheries management and fish conservation of inland water. Capacity building activities, which are regional training and workshop, are key means to improve capacity of ASEAN fisheries official about the responsible utilization of inland fisheries resources.

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

#### 3.1. Expected Outcomes

- 1) The way to promote responsible utilization of inland fisheries
- 2) Promote effective inland fisheries management in the Southeast Asia region
- 3) Promote effective inland fisheries management in the Southeast Asia

#### 3.2. Outputs Indicators and Activities

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: The way to promote responsible utilization of inland fisheries	- Workshop to review activities and methodologies for promotion of inland fisheries and find ways forward (2015)	Activity 1. Review of activities and methodologies for promotion of inland fisheries and find ways forward.	- Participation by at least 11 ASEAN-SEAFDEC Member Countries.
Outcome 2: Promote effective inland fisheries management in the Southeast Asia region	- Study on Co-management and right-based fisheries management applicable to inland fisheries in Southeast Asia  - Workshop to develop guidelines for effective inland fisheries management in Southeast Asia  - Regional training course for improving management of inland fisheries	Activity 2. Promotion of effective inland fisheries management measures	- Participation by at least 11 ASEAN-SEAFDEC Member Countries.
<b>Outcome 3:</b> Promote the habitat conservation and management measures	- Study for development of Habitat Conservation / Resources Enhancement measures applicable to Southeast Asia  - Workshop to develop the policy recommendation on responsible inland fisheries resources utilization in Southeast Asia	<b>Activity 3.</b> Study of Habitat Conservation / Resources Enhancement measures	- Participation by at least 11 ASEAN-SEAFDEC Member Countries.

### 3.3. Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
1). Workshop to review activities and methodologies for promotion of inland fisheries and find ways forward (2 days)	<ol style="list-style-type: none"> <li>1. Based on the enhancing awareness on the importance of inland fisheries, the project will provide the capacity building on review activities and methodologies for promotion of inland fisheries and find ways forward.</li> <li>2. Workshop/Forum Group Discuss (FGD) on review activities and methodologies for promotion of inland fisheries and find ways forward with fisheries expert and officers, also stakeholders.</li> <li>3. This activity is to share, discuss and enhance capacity building the participant on concept of activities and methodologies for promotion of inland fisheries.</li> </ol>
2). Study on Co-management and right-based fisheries management applicable to inland fisheries in Southeast Asia	<ul style="list-style-type: none"> <li>- The information gathering and analyzing on cases of application/implementation of Co-management and right-based fisheries management to inland fisheries in Southeast Asia will be carried out.</li> <li>- Seminar/FGD on Co-management and right-based fisheries management applicable to inland fisheries in Southeast Asia with fisheries expert and officers, also stakeholders will also be conducted. This Seminar/FGD is to share problem and discuss the solution on Co-management and right-based fisheries management applicable to inland fisheries. The seminar will also enhance capacity building on concept the self-regulatory use of fisheries resources and on the reduction of conflict between resources and users.</li> </ul>
3). Workshop to develop guidelines for effective inland fisheries management in Southeast Asia	<ul style="list-style-type: none"> <li>- Workshop to formulate guidelines to promote the use of practical and simple indicators for inland fisheries management framework.</li> </ul>
4) Regional Training course for improving management of inland fisheries	<ul style="list-style-type: none"> <li>- Training course to improvement capacity of fisheries officer on management of inland fisheries.</li> </ul>
5) Study for development of Habitat Conservation / Resources Enhancement measures applicable to Southeast Asia	<ul style="list-style-type: none"> <li>- The sustainability of inland capture fisheries is very much dependent on the quality of respective aquatic habitats and ecosystems. The project will provide the capacity building on Studying for development of Habitat Conservation / Resources Enhancement measures applicable to Southeast Asia.</li> </ul>
6) Workshop to develop the policy recommendation on responsible inland fisheries resources utilization in Southeast Asia	<ul style="list-style-type: none"> <li>- At the end the project, a workshop will be organized with the aim to Establish and implement comprehensive policies and supporting legal and institutional frameworks for an ecosystem approach to inland fisheries management by integrating fisheries and habitat management that devolves co-management to the local authority and stakeholders.</li> </ul>

### 3.2 Activity, Sub-activity and Proposed Budget for 2015-2019:

Table 3 Proposed Budget based on activity and sub-activity for 2015-2019

(Unit: US\$)

Activity	Y1 2015	Y2 2016 <sup>1</sup>	Y3 2017 <sup>2</sup>	Y4 2018 <sup>3</sup>	Y5 2019 <sup>4</sup>
1. Review of activities and methodologies for promotion of inland fisheries and find ways forward	30,000				
2. Promotion of effective inland fisheries management measures	35,038	65,038	45,000	45,000	20,000
3. Study of Habitat Conservation / Resources Enhancement measures			20,038	20,038	45,038
<b>Sub Total</b>	<b>65,038</b>	<b>65,038</b>	<b>65,038</b>	<b>65,038</b>	<b>65,038</b>

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Activity including inputs, period, estimated budget for 2015

(Unit: US\$)

Activity	Timeframe/ period	Inputs <sup>5</sup>	Type of Activity	Proposed Budget
Activity 1: Workshop to review activities and methodologies for promotion of inland fisheries and find ways forward (2 days)	2 <sup>nd</sup> Qtr (2 days)/ April	-	IV. Policy development activities	30,000
Activity 2: Study on Co-management and right-based fisheries management applicable to inland fisheries in Southeast Asia	Jan-Dec	-	IV. Policy development activities	35,038

<sup>1</sup> Not allocated as yet

<sup>2</sup> Not allocated as yet

<sup>3</sup> Not allocated as yet

<sup>4</sup> Not allocated as yet

<sup>5</sup> The financial, human, material, technological and information resources used for development interventions

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 03201501			
<b>Program Categories:</b>	Project under the ASEAN-SEAFDEC FCG/ASSP Mechanism		
<b>Project Title:</b>	Cold Chain Management for Seafood		
<b>Program Thrust:</b>		<b>Total Duration:</b>	2015 - 2017
<b>Lead Department:</b>	MFRD Programmes	<b>Lead Country:</b>	Singapore
<b>Donor/Sponsor:</b>	Singapore (MFRD Other Fund)	<b>Total Donor Budget:</b>	USD 136,120
<b>Project Partner:</b>	Post-Harvest Technology Centre, Agri-Food and Veterinary Authority of Singapore (PHTC/AVA)	<b>Budget for 2015:</b>	USD 77,680
<b>Project leader:</b>	Deputy Director, Supply Chain Section (PHTC/AVA)		

## PART I: OVERALL PROJECT DESCRIPTION

### 1. Brief Project Description

Seafood is a highly perishable product and several chemical and biological changes occur in seafood immediately after capture and/or harvest which can affect its quality and safety. These deteriorative changes are accelerated by poor temperature control along the seafood supply chain. Hence, 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. The project objectives are to assist in upgrading the regional seafood industry in cold chain management and, to develop general guidelines on cold chain management for the seafood industry in the region. This project would be implemented by the 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 comprised of a Project Inception and Planning Meeting, Regional Workshop on Cold Chain Management for Seafood, a 1-year cold chain pilot trials in Member Countries, mid-term progress meeting, preparation and publication of general guidelines on cold chain management for seafood and an End-of-Project seminar. The expected outputs for the project are a regional workshop on cold chain management for seafood, a set of general guidelines on cold chain management for seafood in the ASEAN region 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 and 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. Firstly, one of the major challenges is the lack of or limited integrated supply chain from farm to fork where each industry player regards itself as a separate entity and does not impose cold chain requirements on the next stage in the supply chain. However, any breakage in the cold chain would have cumulative effects on the final quality of the seafood. The great diversity of species combined with multiple international origins and production methods (fishing or farming) further complicate the cold chain requirements. Secondly, seafood and many other traditional fish products in the ASEAN region are largely handled by small and medium-sized establishments which lack appropriate facilities, technologies and knowledge in adopting cold chain practices. Lastly, cold chain management is still seen as non-mandatory in many countries; some cold chain guidelines may have been established but cannot be enforced as regulation.

Notwithstanding these challenges, there is substantial opportunity to create a platform for the ASEAN region to share knowledge, experiences and cost-effective technologies on the cold chain management for seafood. A set of general guidelines may be established to serve as a benchmark for Member Countries when developing their own national guidelines. Cold chain management of seafood should be promoted to safeguard consumer health and food security and to ensure the sustainability of the seafood industry.

The project is proposed based on the following Resolution and Plan of Action as endorsed at the ASEAN-SEAFDEC Conference of 2011:

Resolution 20: Optimize the utilization 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 optimize the utilization 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 Expected Outcomes**

The expected outcomes of the project are:

1. Enhanced regional capabilities in management of the cold chain for seafood.
2. Improved knowledge and understanding on the seafood cold chain and its management in the ASEAN region.

#### **3.2 Outputs Indicators and Activities**

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

<b>Outcomes</b>	<b>Outputs</b>	<b>Activity</b>	<b>Key Performance Indicators</b>
Outcome 1: Enhanced regional capabilities in management of the cold chain for seafood.	- Regional Workshop on Cold Chain	Organization and conduct of the Regional Workshop on Cold Chain Management For Seafood in last qtr	Participation by at least 8 ASEAN-SEAFDEC Member Countries.

	<p>Management for Seafood</p> <ul style="list-style-type: none"> <li>- 1-year seafood cold chain pilot trials</li> <li>- Guidelines On Cold Chain Management for Seafood</li> </ul>	<p>2015.</p> <p>Organization and conduct of the cold chain pilot trials in Member Countries in 2016.</p> <p>Preparation and publication of Guidelines On Cold Chain Management for Seafood in 2017.</p>	<p>Participation by at least 8 ASEAN-SEAFDEC Member Countries.</p> <p>Guidelines On Cold Chain Management for Seafood published and distributed.</p>
<p>Outcome 2: Improved knowledge and understanding on the seafood cold chain and its management in the ASEAN region.</p>	<ul style="list-style-type: none"> <li>- Project Inception and Planning Meeting</li> <li>- 1-year seafood cold chain pilot trials</li> <li>- Mid-Term Progress Meeting</li> <li>- End-of-Project seminar</li> </ul>	<p>Organization and conduct of the Meeting in 2<sup>nd</sup> qtr 2015.</p> <p>Organization and conduct of the cold chain pilot trials in Member Countries in 2016.</p> <p>Organization and conduct of the Meeting in 1<sup>st</sup> qtr 2017.</p> <p>Organization and conduct of the End-of-Project seminar in last quarter 2017.</p>	<p>Participation by at least 8 ASEAN-SEAFDEC Member Countries.</p> <p>Participation by at least 8 ASEAN-SEAFDEC Member Countries.</p> <p>Participation by at least 8 ASEAN-SEAFDEC Member Countries.</p> <p>Participation by at least 8 ASEAN-SEAFDEC Member Countries.</p>

### 3.3 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
<p>Activity 1: Project Inception and Planning Meeting (2 days)</p>	<p>A Project Inception and Planning Meeting will be held in Singapore in 2<sup>nd</sup> quarter 2015 to discuss and plan for all project activities. Two participants each from Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam 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 cooperates, if any, for the project.</p>
<p>Activity 2: Workshop on Cold Chain Management for Seafood (3 days)</p>	<p>A Regional Workshop on Cold Chain Management for Seafood will be organized by MFRD and conducted in Singapore in last quarter 2015. 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 practical on the best practices and technologies for seafood cold chain management, incorporating discussion of end-user and food safety specifications. Participants will learn the temperature logging techniques to monitor the cold chain from harvest to end-user/consumer, with measurement of product quality parameters (e.g. microbiological analyses, drip loss, quality index development, etc). Participants will also be taught how to undertake supply chain monitoring within companies or with specific seafood groups, and develop performance indicators to evaluate the impacts of adopting proper cold chain practices in the seafood business. Good manufacturing and handling practices to ensure product safety and quality will also be emphasized in the course. Field visits to a few Singapore seafood companies may be arranged to understand the supply chain practices in Singapore's seafood industry. The workshop will also discuss to agree on the necessary steps and timelines to meet the project objective to develop a set of generic guidelines on cold chain management for the seafood industry in the region.</p>

Activity 3: Supply Chain/ Cold Chain pilot trials (1 year)	Each country may 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 in 2016. 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 (2 days)	A Mid-term Evaluation and Progress Meeting will be held in Singapore at the end of the pilot trials in 1 <sup>st</sup> quarter 2017 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 seafood cold chain management guidelines and the End-of-Project Seminar. Two participants from each country will be invited to attend.
Activity 5: Preparation and publication of Guidelines on Cold Chain Management for Seafood (6-8months)	Each country will draft a section or sections of the Seafood Cold Chain Management guidelines in 2017. The various sections will be compiled and edited by MFRD which will then publish the guidelines for distribution to ASEAN Member States.
Activity 6: End-of-Project Seminar (2 days)	An End-of-Project Seminar will be organized in last quarter 2017 in Singapore or another Member Country as agreed to share the results of the project and the seafood cold chain guidelines among the Member Countries. Two participants from each country will be invited to attend of which at least one should be from the private sector.

### 3.4 Activity, Sub-activity and Proposed Budget for 2015-2017

Table 3 Proposed Budget based on activity and sub-activity for 2015-2017

Activity	(Unit: USD)		
	Y1 2015	Y2 2016	Y3 2017
Activity 1: Project Inception and Planning Meeting	21,720	-	-
Activity 2: Workshop on Cold Chain Management for Seafood	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
<b>Sub-Total</b>	<b>77,680</b>	<b>10,000</b>	<b>48,440</b>

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Activity including inputs, period, estimated budget for 2015

Activity	Timeframe/ period	Inputs <sup>1</sup>	Type of Activity*	(Unit: USD)
				Proposed Budget
Activity 1: Project Inception and Planning Meeting	2 <sup>nd</sup> Qtr (2 days)	-	IV. Policy development activities	21,720
Activity 2: Workshop on Cold Chain Management for Seafood	4 <sup>th</sup> Qtr (3 days)	-	II. Training activities	55,960

<sup>1</sup> The financial, human, material, technological and information resources used for development interventions





**Annex 6**

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES FOR THE YEAR 2014-2015**

**I. Aquaculture Department (Appendix 1)**

<b>Project Title</b>	<b>2014</b>	<b>2015</b>	<b>Appendix No.</b>
1. Adapting to Climate Change Impacts	Y	Y	2
2. Healthy and Wholesome Aquaculture	Y	Y	3
3. Maintaining Environmental Integrity through Responsible Aquaculture	Y	Y	4
4. Meeting Socio-economic Challenges in Aquaculture	Y	Y	5
5. Quality Seed for Sustainable Aquaculture	Y	Y	6

**II. Training Department (Appendix 7)**

<b>Project Title</b>	<b>2014</b>	<b>2015</b>	<b>Appendix No.</b>
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 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 2014, AQD has implemented 89 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.

This report presents the highlights of activities and accomplishments in 2014 (January to September) under various Departmental Programs:

#### 1. Quality seed for sustainable aquaculture

In this Program are studies and activities that will 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 both for foodfish production and for production of seeds for stock release and conservation. Stocks for both purposes must both be genetically diverse to ensure fitness when farmed/released in specific environments. The following are the accomplishments of activities that address this objective.

With regard to shrimps, two consecutive generations of *Penaeus monodon* were grown as broodstock as part of the study on the development of techniques for the sustainable production of good quality captive *P. monodon* breeders. The reproductive performance of both F<sub>1</sub> and F<sub>2</sub> generation broodstock as well as the effects of sex ratios (1, 2 or 3 males per female) on hatching rates were evaluated. As regards the ideal stocking density for rearing shrimps to broodstock size, higher survival rate (71.2%) was obtained for stocks reared at 0.25 ind/m<sup>2</sup> while broodstock size was obtained within 1.5-2.5 months for those stocked at lower densities of 0.5 and 0.25 ind/m<sup>2</sup>.

Molecular markers that will identify stocks and consequently aid in determining genetic quality are currently being developed for several commercial aquaculture species. Studies on the development of quality shrimps, milkfish, abalone and oyster broodstock through conventional stock monitoring and management protocols are being conducted in collaboration with the University of the Philippines and Japan's Tohoku University. Samples from potential shrimp broodstock collected from various areas in the Philippines have been genetically characterized. Molecular marker-based broodstock management method is also being adopted for the Philippine milkfish, *Chanos chanos* stocks. As for the abalone, stocks from Philippine provinces (Pangasinan, Palawan, Zamboanga del Sur and Masbate) have been collected and families per stock are being evaluated both for genetic diversity and production characteristics.

Apart from genetic intervention, nutritional methods to improve egg production and quality have been done through dietary manipulations. A maturation diet for grouper (*Epinephelus fuscoguttatus*) has been formulated using a natural pigment such as paprika. Feeding trials to assess its effect on seed quality and production were monitored. Concerning abalone, maturation diets are currently being assessed to improve reproduction. The nutrient composition of eggs from wild-sourced abalone and those from hatchery-bred stocks was determined. The effects of varying levels of protein/energy levels in dietary formulations on abalone reproductive performance have also been tested and it showed that lower spawning success was correlated with the lower amount of protein and lipid in the egg. Also, higher levels of dietary lipids (HUFAs and PUFAs) were correlated with better reproductive performance.

Efficient low-pollution diets for use in rearing potential giant freshwater prawn (GFP) broodstock are being developed and tested. Grow-out diets and broodstock diets were formulated to be isonitrogenous and iso-caloric. Sardine fishmeal was replaced with cowpea meal at varying levels in grow-out and broodstock diets. Cowpea meal as a replacement for fishmeal has been noted to be acceptable for freshwater prawns when incorporated up to level of 45%. The economic viability of the use of this alternative protein source shall be determined. In another experiment, GFP spawners stocked in tanks and fed treatment broodstock diets, showed that fecundity increased with increasing levels of cowpea meal in the diet.

The sustainable production of marine annelids (*Marphysa mossambica*) was pursued as these serve as an excellent feed for mud crab broodstock. The reproductive biology and life cycle of the marine annelid have been defined. Moreover, various feed combinations of live annelid and annelid meal as feed for mud crab broodstock have been evaluated to improve reproductive performance. Test diets have been prepared and maturing females are now being fed with test diets.

In the oyster, *Crassostrea irredalei*, improved protocols for broodstock management and conditioning are being developed to maximize production. Preliminary data showed that broodstock reared semi-intensively in ponds, estuaries and tanks, given 200,000 cells/ml<sup>1</sup> of microalgae resulted to faster gonadal development.

Concerning the species for stock enhancement, the Napoleon wrasse, *Cheilinus undulatus*, is a subject of research at AQD primarily to understand its reproductive biology and consequently enable the production of seedstock for use in stock enhancement activities. Efforts to develop broodstock of Napoleon wrasse have not been successful due to difficulty in stock collection. Meanwhile, 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.

- *Refinement of hatchery and nursery management methods to improve seedstock quality and production*

In the pompano *Trachinotus blochii*, optimum conditions for hatchery production were determined. Probiotic addition to live food improved growth and survival of pompano larvae. The enhancement likewise improved larval resistance to stress such as hypoxia and stimulated digestive enzyme activities. Protocols for the nursery rearing of pompano in cages have also been developed. Nursery trials using pompano of different initial size at stocking showed that better growth was observed in fish stocked at <5g when fed pompano diet. Comparable growth was noted in bigger size fry fed either pompano feed or a generic high value fish feed. When stocked at 1500 and 2000/cage, comparable growth, survival and duration of culture to reach 50g were noted in the two stocking densities. Costs for production under the various interventions are being noted to enable determination of the most suitable, cost-effective seed production scheme.

To improve the seed yield of selected high value marine fish species such as grouper, red snapper, seabass, rabbitfish and pompano, sodium-iodide enriched rotifers and *Artemia* were used as feed for larvae. Metamorphosis and survival of the same high value species were noted. Survival rate for red snapper improved when fed sodium iodide enriched rotifer (for 16 hours) and *Artemia*. Snapper fed sodium iodide enriched rotifer metamorphosed earlier than those fed enriched *Artemia*.

---

<sup>1</sup> Algal concentration is measured and reported in terms of cells per milliliter (cells/ml)

*Cocconeis* sp., *Nitzschia* sp and *Diploneis* sp have been used as alternative benthic diatom feed species for the hatchery rearing of abalone. Also, feeding preference experiments involving abalone juveniles were conducted. Among the natural food organisms tested, gut analysis showed that *Amphora* sp was highly digestible (27.49%); hence, this gave significantly higher growth rate in abalones.

Another nutritional intervention to improve abalone hatchery production is the administration of microparticulate diets (MPD) as alternative feed. The use of MPD during the abalone nursery stage showed high % settlement rate (range of 25 - 37%). Feeding frequency trials in big tanks also indicated that daily feeding is needed to sustain abalone survival in the nursery rearing phase. In another experiment which aimed to increase the survival rate of abalone veliger larvae through the improvement of harvest, stocking density and incubation protocols, it was noted that the highest veliger survival (80%) was attained at 5ml<sup>-1</sup> stocking density and regardless of stocking density, larval survival decreased at extended incubation time (16-24h).

In the oyster, different spawning techniques are being compared to determine the optimal method that can provide a steady production of quality oyster seedstock. All methods (desiccation, thermal manipulation and exposure to UV-irradiated water) induced oysters to spawn but a faster response (15 min) was noted in the thermally manipulated batch with a higher number of eggs released per mass spawning batch. When larval rearing performance in tanks subjected to partial flow-through and/or static water was compared, survival was higher in static water culture. Finally, feeding the algal species, *Isochrysis galbana* alone to oyster larvae gave better survival compared to combination feeding with alga, *Chaetoceros calcitrans* or *Chaetoceros calcitrans* alone.

Efforts have been made to further improve mud crab hatchery schemes. Enhanced larval growth performance was noted in a diet composed of 1% squid meal and 1% annelid meal. Molt death syndrome (MDS) was lower in larvae fed formulated diet plus natural food. As regards the use of antibiotics, experiments on the application of antibiotics, antimicrobial nitrofurans and probiotics in larval rearing were conducted. Larvae treated with antibiotics commonly used in the hatchery still gave the best result since antibiotic treated larvae survived the longest (10 days) compared to the other treatments.

The influence of stocking density and tryptophan diets on the survival and growth of mud crab *Scylla serrata* in the nursery phase is being determined. Based on stocking density, crabs reared for four weeks at 30/m<sup>2</sup> had higher survival than those stocked at 50/m<sup>2</sup> (59.7% vs. 47.6%). On the other hand, crabs fed mussel and basal artificial diet survived better (57.7%) than those fed mussel alone or mussel and artificial diet with 0.5 to 0.75% tryptophan. In another nursery experiment, crabs stocked at 5/m<sup>2</sup> and 10/m<sup>2</sup> and subjected to the same feeding regimes, survived better in the mussel and basal artificial diet combination. Survival on the other hand was better in a lower stocking density of 5/m<sup>2</sup> than at 10/m<sup>2</sup>. It was noted that tryptophan did little to reduce incidence of cannibalism. Meanwhile, in determining the optimal feeding ratio of natural food (NF) to artificial diet (AD) that can be used during the 1<sup>st</sup> and 2<sup>nd</sup> mudcrab nursery phases, survival rates ranging from 80-90% in NF:AD combinations were higher than feeding singly with either NF or AD. As regards cannibalism in mud crabs, net ribbon shelters were observed to be best in controlling cannibalism in mudcrabs, especially when done at low densities of 30/m<sup>2</sup>.

Apart from mud crabs, larval studies have been done on the blue swimming crab (BSC) *Portunus pelagicus*. Results showed that natural food (rotifer) and BP Nippai (brand name of commercial larval diet for shrimps) gave the highest survival and growth index followed by those fed natural food plus *P. japonicus* or *P. monodon* (brand name of commercial larval diet for shrimps). Antibiotics have also been tested to evaluate its impact in larval production. Megalopae were produced (4.0%) even without antibiotics indicating that megalopae can still be produced depending on the quality of the larvae. The optimal stocking density was also tested to improve the production in two nursery phases. When reared in net cages, survival was best at 54% in 30 individuals/m<sup>2</sup> for phase 1 and 80% for stocks reared at 10 individuals/m<sup>2</sup> for phase 2 rearing.

To further promote *Kappaphycus* culture, nursery rearing techniques are being refined. *Kappaphycus* nursed in land based enclosures gave 90-100% survival at a specific growth rate (SGR) of 1.5% while those reared in sea-based cages survived at a rate of 23-50% with and SGR of 3%. Efforts to outplant tissue culture explants are currently being undertaken in Bohol, Zamboanga, Guimaras and Antique.

Concerning the emerging species for aquaculture such as the silver perch *Leiopotherapon plumbeus*, two rotifer strains (*Brachionus rotundiformis* and *B. plicatilis*) were tested as starter food for first feeding larvae. Silver perch larvae fed *B. rotundiformis* had higher survival compared to those fed *B. rotundiformis* and *Moina* sp. With regard to sandfish, *Holothuria scabra*, refinements in the hatchery and nursery protocols have been undertaken to improve production. For the nursery, the floating hapa design was noted and optimal stocking density was determined. PVC pipes instead of bamboo framed modules increased ease of maintenance and monitoring of sandfish in nursery cages. Survival was also found to be highest in the lowest stock density of 30/m<sup>2</sup>.

With regard to species for stock enhancement, the seahorses, *Hippocampus barbouri* and *H. comes*, are continuously being propagated in the SEAFDEC/AQD hatchery for possible stock release. Prior to seed production for stock release, genetic analysis of the different seahorse species are being pursued. Tissue samples from seahorses collected from Molocaboc Island in Sagay City have been analysed for genetic characterization.

- *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 commenced for selected crustaceans (for mud crab, shrimps and freshwater prawns). For the mud crab, stress tests (particularly formalin tolerance and disease challenge response tests) were continued to determine strain level differences in the effort of identifying stocks with better fitness attributes.

For the giant freshwater prawn, the approach for genetic improvement is to assess and determine the effective broodstock management scheme to enhance growth and/or reproductive performance. For 2014, potential broodstocks from two sources, Calumpit, Bulacan and Pampanga River were used for growth and reproductive performance comparison. Broodstock management (reciprocal crossing between stocks from the same site but obtained in different periods and optimal sex ratio) has shown some improvement in terms of growth in the domesticated strains. Reciprocal “hybrids” used as broodstock seem to have a positive effect on the performance of the progenies when tested for growth.

Hybridization is currently being done on the local commercial abalone species (*Haliotis asinina*) by crossing this with other Philippine abalone species, *H. planata* and *H. glabra*, to enable the production of stocks/species with improved traits. After 210 days of culture, specific growth rate was not significantly different between pure *H. asinina*, hybrid *H. asinina* x *H. planata*, and *H. asinina* x *H. glabra*. Survival was highest for the pure *H. asinina*, followed by *H. glabra* hybrid and *H. planata* hybrid.

To counter the problem of ice-ice disease in seaweeds, methods to develop resistant strains of the seaweed *Kappaphycus* and reduce 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. Finally, the carrageenan quality of *Kappaphycus* produced from spores is not different.

## **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 probiotics and rationalization of the needs and application of diagnostics that will ensure biosecurity within culture systems*

Investigation on the application and mode of action of probiotics *Bacillus* species in the larviculture of *Penaeus* was continued. To determine the effects of different levels of intracellular PHB (polyhydrobutyric acid) on the probiotic capacity of *Bacillus* sp., suitable growth conditions that allowed the bacteria to accumulate different levels of intracellular PHB was established. The highest PHB accumulation was observed at 48 h in Luria Bertani (LB) + 2% glucose. In another experiment, the effects of application and mode of action of PHB in the larviculture of *Penaeus* spp. was examined. The practical applications of

PHB bioplastics as shrimp shelter and as substrate for microbial colonization/biofilm formation, as well as its biodegradability are currently being investigated.

- *Promotion on the wider use of conventional diagnostic as well as new methods for newly reported, emerging diseases*

With regard to the study which aims to investigate the emerging diseases of tilapia in the Philippines, the dominant bacteria isolated from the water, sediment, as well as gills and intestines of the fish were characterized biochemically using the conventional methods and commercial kits. A total 19 bacterial genera and 31 species were identified. The data indicate that bacterial composition in the pond water and sediment accordingly reflects the bacterial composition in the gills and intestine of tilapia. Meanwhile in another study which was initiated only in 2014, the sanitary quality of oysters cultured in major oyster producing areas in the Visayan region is currently being investigated. With regard to the epidemiological study which aims to elucidate on the spread route of shrimp and viral diseases, *P. monodon* tissue samples were collected from shrimp farms in the Philippines and analyzed for the presence of shrimp viruses (WSSV, YHV). In a related study on wild and farmed mud crab, efforts were also continued to identify and describe the diseases affecting the farmed and wild mud crab in 17 mud crab producing provinces in the Philippines. A total of 767 mud crab samples collected from different environments (poly/monocultured pond, aquasilviculture and natural bodies of water) of the 17 Philippine provinces were processed for bacterial, fungal, parasite and viral detection.

Another initiative continued in 2014 was the establishment of the Philippine shrimp pathogen bio-bank and online bio-surveillance information resource. The prototype database software has been developed using Fish Health Section diagnostic data gathered from 2013 to 2014. Pertinent literatures concerning each pathogen are being compiled from available sources. In another study which focuses on molecular diagnosis and prevention of economically important viruses in fish and shrimps, plasmids to be used as positive control for the shrimp (WSSV, IMNV, and TSV) and fish viruses (VNN [viral nervous necrosis], KHV [koi herpes virus], and RSIV [red sea bream iridovirus]) have already completed.

Concerning the commercially important freshwater fishes in selected Southeast Asian countries, tissue samples of freshwater fishes collected from selected provinces in the Philippines' Region XIII (Caraga) were examined for the presence of fish-borne zoonotic parasites, metacercariae. In another study on abalone, *Haliotis asinina*, continued screening of live hatchery stocks from SEAFDEC/AQD for parasites and shell diseases were done. To examine the infectivity of shell-boring polychaetes present in naturally-infected to healthy abalone, a cohabitation experiment was conducted. Results showed that polychaetes from infected abalones could be transmitted to healthy ones within 48-72 hours post-cohabitation. The infectivity rate of shell-boring polychaetes from naturally-infected to healthy abalone was 60%.

- *Finding effective alternative safe drugs/chemicals to manage aquaculture diseases in lieu of harmful chemicals and drugs*

One of the initiatives being undertaken to address this objective involves developing novel strategies to reduce disease incidence in mud crab hatchery and grow-out. Test materials (leaves of terrestrial plants) were obtained locally from different areas in Panay. Among those tested, crude extracts from *Nephelium lappaceum* (Rambutan) and *Terminalia catappa* (Tropical almond tree) showed significant in vitro antibacterial activity against *V. harveyi* and *E. coli* in agar disc diffusion test. Extracts that showed in vitro antimicrobial activity (*T. catappa* and *N. lappaceum*) were further tested for their toxicity to determine the proper dose for *in vivo* administration in different larval stages of crab. Also in another study, bacterial isolates obtained in 2013 are being tested for their pathogenicity to screen for potential probiotics. Pathogenicity tests were conducted for different stages and sizes of the mangrove crab *Scylla serrata*. Determination of their efficacy in preventing/alleviating bacterial infection in different crab larval stages will follow. Apart from these studies, experiments were continued to examine the practical applications of the developed techniques for vaccinating crabs and other crustaceans to reduce the incidence of diseases during hatchery and grow-out.

Concerning the commercially important mariculture fish, studies were implemented to establish the novel prophylactic and therapeutic methods for the prevention of bacterial and viral infections. *Ulva pertusa*

crude ethanolic extract was found to possess potent antibacterial activity against *Aeromonas hydrophila* and *A. sobria*, which are known fish pathogens. The pathogenicity of *A. hydrophila* isolated from the intestine of tilapia, which will be eventually used as fish pathogen for the experiment on the efficacy of *U. pertusa*, was also examined. In another study, immunization regimen is being established to prevent the onset of viral nervous necrosis (VNN) in high-value marine broodfish. Current data corroborate with the supposition that annual booster vaccination of pompano broodstocks reared in floating net cages could immunogenically mount the production of NNV-neutralizing antibodies in these fish, thereby giving protection against horizontal and vertical transmission of the NNV to their offspring. This finding demonstrates the practicality of maintaining VNN-specific-free pompano broodstocks reared in floating net cages in the open sea through vaccination regimen.

- *Finding different sources of fish meal substitutes and development of effective feed management schemes that incorporate sound management*

AQD has continued to provide greater focus in addressing this objective through various studies. One of such studies was the optimization of the feeding and management strategies of growing milkfish in marine floating net cages and brackishwater ponds using improved milkfish practical feed with optimum inclusion of soybean meal and soy protein concentrate. The inclusion of these ingredients as alternative to fish meal in practical diets for milkfish resulted in higher average body weight gain (82g) compared to those given the commercial diet (54.5g). In another experiment which also aims to improve feed formulation for milkfish culture in ponds and cages, the incorporation of cowpea and mung bean resulted in higher growth rate as compared to those given the commercial diet. Apart from these plant protein sources, another experiment tested the use of distillers dried grain with soluble (DDGS) as protein ingredient for milkfish diets. Results showed that DDGS can replace up to 15% of protein from fish meal. Histological analyses of the digestive tract of milkfish showed normal structures in the dietary treatment.

Efforts were also continued to improve the nutritional value of locally available feed resources by fermentation. Growth experiments showed best growth and survival rates in the control diet and diets with fermented cowpea. In another study, experiments were done to evaluate the milkfish by-product hydrolysate as ingredient in juvenile grouper, *Epinephelus coioides* diets. Milkfish offals hydrolyzed using a commercially available enzyme (AP-10 *Bacillus subtilis*) resulted in a crude protein content of 61% and a yield of 21%. Growth experiments showed higher weight gain with grouper fed diets with hydrolysate incorporation.

With regard to mud crab, the testing of various attractants to improve feeds and management practices for grow-out culture showed positive results for marine based attractants such as ascetes, squid meal, shrimp paste and spoiled fish flesh. Purified attractants such as putrescine also showed positive results in both high (3%) and low (1%) levels while cadaverine showed positive results only at high levels. For giant freshwater prawn, *M. rosenbergii*, the effects of feed management strategies and periphyton-based production on production of giant freshwater prawn cultured in cages in Laguna lake were assessed. Results showed that the presence of substrate significantly improved the growth rate across all feed rations (2,4,8 and 15% of biomass equivalent).

- *Development of aquafeeds for selected species at specific growth stages especially for species or stages for which no artificial feed has been formulated*

The golden pompano, *Trachinotus blochii*, is one of the test species that is being assessed to address this objective. Highest percent weight gain, specific growth rate and lowest feed conversion ratio were noted with pompano given feed with the highest crude protein level (55%) and supplemented with amino acids. Apart from experiments on golden pompano, the existing feed formulation for grow-out of mud crab is being evaluated. Basal diet for mud crab was identified to contain 48% CP, 8% CF and a dietary energy of 1723MJ/kg diet. Crab fed feeds with synthetic binders increased in size after molting in both sexes. Another species tested to address the objective is the tropical abalone, *H. asinina*. The old (original) and improved/refined diet formulations for grow-out stage were evaluated. Results showed highest shell length increase of 28-30% for the stocks given the refined formulated diet compared to the 17-18% for the stocks fed the old (original) diet.



- *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*

Various studies are being implemented to address this objective. Separate semi-intensive grow-out experiments were continued to assess the economic feasibility of rearing grouper and rabbitfish in brackishwater ponds using either commercial diet or AQD-formulated diets. With regard to mud crab, pond trials were done to develop the protocols for production of hatchery-reared mud crab juveniles for soft-shell crab farming. Concerning the shrimp, *P. indicus*, the performance of hatchery-bred and wild stocks during grow-out was compared. The other demonstration trial conducted was on Nile tilapia in cages in Laguna de Bay. The practical and eco-friendly supplemental feeding schedules were evaluated. The best feeding scheme observed was full feeding after 160 days of culture followed by 45 and 75 days to harvest.

### **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. For 2014, studies were continued on assessing the impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems; developing and promoting efficient and suitable environment-friendly culture systems; and conducting biological and ecological studies on species with potentials for resource enhancement.

- *Assessment of 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 different stations of SEAFDEC/AQD are undergoing regular monitoring with the following accomplishments. In Igang Marine Station (IMS) and its surrounding area, bathymetric profile of various stations and sediment size analyses have been completed. The biodiversity of the various ecosystem types as well as near the cage set-up was also determined. With regard to Tigbauan Main Station (TMS), sampling of the shore areas around TMS is being conducted. Some 543 species in 203 families in 10 major taxa have been collected or photographed. Preparations for publication of a book on the marine biodiversity in Tigbauan, Iloilo have also been initiated. In Binangonan Freshwater Station (BFS), a comparison of phytoplankton, zooplankton and fish and other vertebrate diversity in two sites around the station, the East Cove (an aquaculture site) and the West Cove (non-aquaculture site) was continued. Biodiversity indices were significantly better in the non-aquaculture site (WC) compared to the aquaculture site (EC). Also, significantly higher catch was found from EC than WC. However, higher dominance of native species in WC was noted compared to EC. Meanwhile, in another study, a project on the biodiversity in the milkfish and shrimp fry fishery in the surf zones in southern and western Panay was continued.

- *Development and promotion of an efficient and suitable environment-friendly culture systems*

Studies on the culture of the sandfish, *Holothuria scabra*, have been continued. In addition, through external funding support for abalone, *H. asinina*, grow-out studies particularly in small islands and communities recently started. Refinement of grow-out techniques for the slipper oyster under Philippine conditions also started recently through external funding support.

Experiments were conducted to determine optimal conditions for the culture of the sandfish *H. scabra*. In the previous years, substrate type, salinity, and stocking density experiments were done to assess growth and survival of sandfish juveniles. For 2014, results showed that after 30 days of culture in selected experimental sites, sandy sediment as substrate promoted higher growth and survival. With regard to stocking density experiment on juveniles, using 12, 25, and 50 ind•m<sup>-2</sup>, best growth was observed in the lowest stocking density. Survival on the other hand was not affected by the aforementioned stocking density which ranged from 88 to 91.5%.

Re-assessment of sea ranching site in Concepcion, Iloilo was done to compare the status of the habitat in terms of suitability for sandfish ranching, substrate quality and biota composition after it was hit by

typhoon Haiyan (Yolanda) in 2013. Through agreement with the local government unit in Concepcion, a pilot sea cucumber sea ranching site at Polopina Island was designated. A trial nursery run was started to evaluate the suitability of AQD's (Igang Marine Station) nursery design in Concepcion. Baseline information from local fishers' organization was obtained through survey questionnaire. A focused group discussion and mapping exercise were also conducted to assess the needs of the community and use these as bases for implementing intervention strategies.

For the abalone experiments in both nursery and grow-out, different types of containers (perforated plastic trays, empty oil containers, polyvinyl chloride tubes and plastic mesh cages) are currently being tested simultaneously in reef flats in Agho Island, Concepcion, Iloilo and in concrete tanks at AQD's Tigbauan Main Station. Stocking density trials for the nursery phase are also on-going.

Concerning the study on oyster, a preliminary assessment of various oyster farms in Panay Island was conducted. Of the sites evaluated, New Washington, Aklan was selected for the project and a Memorandum of Agreement with the Local Government Unit of the chosen site has been signed. Grow-out trial that will test the use of different culture containers (tires, hanging oyster shells, pouches and trays) will commence upon completion of fabrication of pouches and trays.

- *Conduct of biological and ecological studies on species with potentials for resource enhancement*

The studies on *Tridacna gigas* were completed. The stock enhancement of mud crab and the community managed sea ranching and stock release of sandfish *H. scabra* are also underway.

#### **4. Adapting to climate change impacts**

The Program aims to identify the accompanying changes in the environment brought about by the changing climate that may affect the aquaculture sector, prepare the sector to the possible effects that these changes may have on aquaculture operations, minimize and mitigate the adverse impacts of climate in aquaculture, and ensure the continued operation of all aquaculture production systems under changing climatic conditions. For 2014, studies have focused on generating scientific information on the effects of: (i) increasing temperature on the susceptibilities of different stages of tropical marine invertebrate, the abalone (*H. asinina*) and (ii) acidic conditions and elevated temperature on corals.

Concerning the abalone, experiments were conducted to expose the different stages of the species to elevated temperature treatments [control - ambient (28-29°C), 31°C, 33°C]. Embryonic stage was significantly affected by very high temperature. When newly fertilized eggs were incubated in 33°C, very few embryos developed and hatching rate was very low (20% in 33°C and 86 % in ambient temperature). Survival was also significantly lower in larvae reared at 31°C and 33°C compared to ambient temperature. On the other hand, when abalone juveniles (3 cm) were reared in temperatures 31 and 33°C for one month, the growth and survival were not significantly affected. It was also found that elevated temperature has an adverse effect on abalone breeders. Mature females were very sensitive to very high temperature. After 45 days of exposure to 33°C all the female breeders died, while only 10 % of the male breeders survived until 60 days. Furthermore, there was a significant reduction in growth and feeding rates of breeders reared at elevated temperature. Their gonads also regressed. Results indicate that developing or early and spawning stages of abalone are very sensitive to the effects of elevated temperature. These stages have a very narrow thermal tolerance compared to juvenile stage.

Concerning the studies on corals, fragments (*Porites sp.*) were collected and kept alive in a tank system equipped with fresh sand-filtered seawater supply via a flow-through system. Treatments were: temperature [ambient temp: 28-29 (control) and 31°C]; pH [>8.0 (control) and 7.5]. Low survival and reduction in growth were observed in corals exposed to acidic condition and higher temperature. This shows that climate change can adversely affect the coral reef population that will eventually result in the reduction of the coral reef productivity.

#### **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 and these cover 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*

For freshwater aquaculture, a third on-farm demonstration run of grow-out culture of giant freshwater prawn (GFP), *M. rosenbergii*, in polyculture with tilapia in net cages in Laguna Lake was conducted. In view of the continuous consumer demand and the modest income derived year-round from tilapia culture, tilapia growers have reiterated their interest in this activity. They also expressed interest in adopting GFP culture if this is done in polyculture with tilapia. The studies that address Objective 1 have demonstrated that new aquaculture technologies such as the grow-out culture of GFP in cages in Laguna Lake can be integrated either with existing tilapia fingerling or grow-out production that already provide modest incomes to fish farmers.

The stock enhancement of marine species such as abalone, *H. asinina*, and tiger prawn, *P. monodon*, following the community-based strategies was continued. Abalones were released starting in June 2011 and since August 2013, regulated harvesting following 6 cm shell length catch-size regulation has been practiced by the local fisherfolk in Barangay Molocaboc within the Sagay Marine Reserve (SMR) in Negros Occidental. In another study conducted in New Washington, Aklan province, three runs and release of tiger prawns, were done in collaboration with the fisherfolks of Barangay (village) Pinamuk-an. The improvement of survival rates (at 44% ) during the intermediate culture phase and reports of catching tagged shrimps have motivated fisherfolks to participate in culture and future release activities. These studies have demonstrated that in both locations (Sagay and New Washington), information, education and communication activities, as well as support fisheries regulations and policies are needed to sustain benefits from stock enhancement.

- *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 but eco-friendly culture technologies such as the integrated multi-trophic aquaculture (IMTA) in milkfish mariculture are being evaluated through a survey of milkfish cage and pen owners in three regional sites in the Philippines. Initial results of survey done in one of the regions showed that IMTA concept is acceptable among large-scale mariculture operators due to ecological and economic benefits. However, cage design and sources of seeds of co-cultured species such as sea cucumber, oyster, mussel and seaweeds are a major concern. Similarly, a socioeconomic assessment of the highly threatened ecology such as Napoleon wrasse fishery in Bohol island in central Philippines was initiated and this will complement a study on seed production of this species.

- *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*

AQD has collaborated and contributed to the FAO -AFSPAN (Aquaculture for Food Security, Poverty Alleviation and Nutrition) project by conducting the required surveys/desk studies that investigate the role of aquaculture in poverty alleviation, food security and nutrition. Most recently, the Program also established cooperation with a local private company to conduct a market, industry and consumption study of selected high-value indigenous species in the Philippines.

## **OTHER R&D ACTIVITIES**

### **1. Institutional Capacity Development on Sustainable Aquaculture (ICDSA) and Other Collaborative Projects**

For the collaborative projects with Philippine Bureau of Fisheries and Aquatic Resources (BFAR), SEAFDEC/AQD has rendered technical assistance in the construction of multi-species marine fish hatcheries in different parts of the Philippines. The multi-species marine fish 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 Lao-ang, Samar is on-going while construction of the hatchery facilities in Sagnay, Camarines Sur is about to start. SEAFDEC/AQD will also provide technical assistance in the construction of a multispecies marine fish breeding and research center in Odiongan, Romblon in collaboration with the Provincial government and BFAR.

SEAFDEC/AQD is working with Winrock International (an NGO) in implementing a development project for improved production efficiency in the CARAGA<sup>2</sup> region. 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**

The ABOT (Agree-Build-Operate-Transfer) AquaNegosyo (aquaculture business) Program aims to disseminate science-based aquaculture technologies to encourage private sector investments in aquafarming for livelihood generation and food security. Technology packages are promoted to potential local and international business investors through the provision of technical assistance in every phase of on-farm operations, from site selection to fish stocking, feeding, water and health management, monitoring, harvesting and post production.

The Program received 57 local and 15 foreign inquiries from January to September. Six local and one foreign ABOT clients have been served. Of the 51 who inquired about the ABOT AquaNegosyo Program, nine requested for cost estimates to start an aquabusiness, while nine other inquiries were on brackishwater polyculture. Other inquiries were on hatchery of milkfish, grouper and seabass and culture of eel, abalone, giant freshwater prawn, seaweeds, sandfish, shrimps and crabs.

### **3. Training and Information**

The training courses conducted were on the following areas: marine fish (grouper, snapper, sea bass, pompano, rabbitfish and milkfish), catfish and shrimp hatchery operations; hatchery, nursery and grow-out of tilapia, catfish, giant freshwater prawn, abalone and mud crab; hatchery and nursery of sea cucumber; seaweeds nursery; community-based mangrove rehabilitation, freshwater aquaculture; culture of marine fish, shrimp, abalone, seaweeds; fish health management; formulation and preparation of feeds and feeding management; and information dissemination and data management. A total of 224 trainees participated in the different courses offered between January and mid- September. A distance learning course on principles of health management in aquaculture (Aquahealth online) was started in September and will run until February 2015, with 40 participants. On-site training courses on fish health management and on-farm feed preparation and feeding management will be conducted in Lao PDR in November as part of the GOJ-TF regional programs on the promotion of sustainable aquaculture practices. On-site training courses on mud crab nursery and grow-out will also be organized for partner state colleges and universities under the Philippines' Department of Science and Technology's National Mud Crab Program.

The Training Section also facilitated the internship program availed of by 21 individuals, student on-the-job training program availed of by 218 students from 24 schools/universities. The Philippines, being the host country to AQD, had the most number of participants to the various capacity building programs of the Department. Overall, AQD's capacity building programs have produced a large number of technical

---

<sup>2</sup> Represents 4 provinces in the Philippines – Agusan del Norte, Agusan del Sur, Surigao del Norte and Surigao del Sur

personnel who are now in the aquaculture business themselves or conduct/direct further R&D in their home countries. In view of the emphasis being given by AQD on building the critical mass of experts on aquaculture technologies, there is now a ripple effect that is created when these technologies are promoted and practiced.

With regard to information dissemination, apart from scientific publications in international peer-reviewed journals, AQD published 4 new manuals (Hatchery production of snubnose pompano *Trachinotus blochii* Lacepede, Intensive culture of milkfish *Chanos chanos* in polyculture with white shrimp *Penaeus indicus* or mud crab *Scylla serrata* in brackishwater earthen ponds, Milkfish *Chanos chanos* cage culture operations, and Seed production of rabbitfish *Siganus guttatus*). Flyers about SEAFDEC/AQD, its stations, programs and other information materials about the Department, including the 2013 Highlights were also produced.

AQD also published the monthly issues of AQD Matters, did frequent updating of the AQD website resulting in a significant increase in the number of monthly unique visitors, posted stories about events at AQD in Facebook, facilitated airing of AQD aquaculture technologies in a weekly TV program Mag-Agri Tayo (Let's do Agriculture) as well as press releases about the Department's events and initiatives, and participated in fairs and exhibits. All these activities address the Department's mandate of timely dissemination of information and at the same time help enhance its visibility to its various stakeholders.

## **PLANS IN 2015**

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 2014:**

- a) Quality seed for sustainable aquaculture
- b) Healthy and wholesome aquaculture
- c) Maintaining environmental integrity through responsible aquaculture
- d) Adapting to climate change impacts
- e) Meeting social and economic challenges in aquaculture

#### **Proposed Departmental Programs for 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
- e) Meeting social and economic challenges in aquaculture

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Adapting to Climate Change  
**Responsible Department:** Aquaculture Department  
**Total Duration:** 2012-2016  
**Funding Sources:** Philippine Government  
**Estimated Budget for 2015:** USD100,000

### 1. INTRODUCTION

The changing global weather patterns brought about by increased global emission of carbon dioxide into the atmosphere are predicted to have serious impacts on many life forms on earth. This year alone, an estimated all-time high of 34 billion tonnes of carbon dioxide emission was already recorded, an increase of 3% compared to last year (European Commission's Joint Research Center). The high level of carbon dioxide in the atmosphere has already resulted in global warming and has changed the chemistry of the world's oceans in ways that are already harming the coral-reef ecosystem and shell-building organisms (IPCC 2007). These changes could lead to broad impacts on marine ecosystems. The extreme weather disturbances, like more frequent and stronger typhoons, long dry spells resulting to droughts, frequent heavy rains resulting to severe flooding, that are observed in recent years are some of the phenomena that are linked to 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 in this scenario 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 of climate change in aquaculture, and ensure the continued operations of all aquaculture production system under changing climatic conditions.

#### Objectives

- 1) Gather scientific information on susceptibilities of various aquaculture species to the combined effects of increasing water temperature and acidity;
- 2) Gather scientific data on the effect of climate change to production of natural live food in the hatcheries and ponds for aquaculture system;
- 3) To promote public awareness on the possible effects of climate change to aquaculture activities and to fish farmers;
- 4) To assist the government agencies in the country and in the region in gathering baseline information on aquaculture areas that are susceptible to climate change effects;
- 5) Gather scientific information that will serve as basis for the formulation or design of alternative aquaculture system that are adaptive to climate change;

- 6) To collaborate with other institution in the country and in the region in gathering baseline information on the effects of climate change to mangrove and coral reef; and
- 7) To explore potential adaptive measures to mitigate the impacts of climate change to the aquatic system.

## 2.2. Expected Outputs

- Scientific information generated on the effects of increasing temperature on: (i) the reproductive performance of important aquaculture commodities; (ii) the embryonic and early larval development of important aquaculture commodities; (iii) growth, survival and reproduction in seaweeds; (iv) susceptibility to diseases of fish, shrimp and seaweeds;
- Scientific information generated on the effects of increasing temperature, pH and salinity on reproduction and growth of natural food organisms used in fish hatcheries;
- Field data gathered on the relationship of environmental parameters on seaweed production and occurrence of diseases;
- Availability of scientific information that will serve as basis for the formulation or design of alternative aquaculture system that are adaptive to climate change; and
- Public awareness on the possible effects of climate change to aquaculture activities and to fish farmers promoted

## 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 2014

### a. Generate scientific information on the effects of increasing temperature on the susceptibilities of different stages of development of aquaculture species

#### *Abalone (*Haliotis asinina*)*

Very limited information is available on how elevated temperature affects the different developmental stages of tropical marine invertebrates. This was investigated in tropical abalone (*Haliotis asinina*). Experiments were conducted to expose the different stages of abalone to elevated temperature treatments [control - ambient (28-29°C), 31°C, 33°C].

#### *Effect on embryonic stage*

Embryonic stage was significantly affected by very high temperature. When newly fertilized eggs were incubated in 33°C, very few embryos developed and hatching rate was very low. Hatching rate was only 20% in 33°C while 86 % in ambient temperature.

#### *Effect on larvae*

Larval survival and settlement success were also adversely affected by elevated temperature. Survival was significantly lower in larvae reared at 31°C and 33°C compared to ambient temperature.

*Effect on juvenile*

Juvenile abalones were more resilient to the effects of elevated temperature. When juvenile abalones (3 cm) were reared in temperatures 31 and 33°C for 1 month, the growth and survival were not significantly affected.

*Effect on broodstocks / spawners*

Elevated temperature has an adverse effect on abalone breeders. Mature females were very sensitive to very high temperature. After 45 days of exposure to 33°C all the female breeders died, while only 10 % of the male breeders survived until 60 days. Furthermore, there was a significant reduction in growth and feeding rates of breeders reared at elevated temperature. Their gonads has also regressed. After 3 months, there were 80% survival in breeders reared at ambient temperature, while 50% in breeders reared at 31°C and none left in 33°C.

The above result indicates that developing or early stages and spawners are very sensitive to the effects of elevated temperature. These stages have a very narrow thermal tolerance compared to juvenile stage.

**b. Generate scientific data on the effect of acidic conditions and elevated temperature on corals**

Experiment on the effect of climate change on coral growth and survival was conducted. Corals were exposed to elevated temperature and acidic conditions in the laboratory. In this study, coral fragments (*Porites sp.*) were collected and kept alive in a tank system equipped with fresh sand-filtered seawater supply via a flow-through system. Treatments were: temperature [ambient temp: 28-29 (control) and 31°C]; pH [>8.0 (control) and 7.5]. Acidic condition (pH <8.0) was achieved by bubbling of CO<sub>2</sub> gas to the culture water. Low survival and reduction in growth was observed in corals exposed to acidic condition and higher temperature. This shows that climate change can adversely affect the coral reef population that will eventually result in the reduction of the coral reef productivity.

Major program activity	Duration	Remarks
Generate scientific information on the effects of increasing temperature on the susceptibilities of different stages of development of aquaculture species: Abalone	2014	Hatching rate, larval survival and settlement success in abalone is very low in 33°C. Ambient temperature gives a better survival compared to higher temperature treatments  Breeders are very sensitive to elevated temperatures. Prolong exposure to 33°C for 60 days result in mass mortalities. Growth, and feeding rates were lowest at 33°C. Gonadal development was negatively affected by elevated temperature.  Juveniles were more resilient to elevated temperature. No significant changes in the growth of juveniles when reared at 31 and 33°C
Generate scientific information on the effect of acidic conditions and elevated temperature on corals	2014	Low survival and reduction in growth was observed in corals exposed to acidic condition and higher temperature



#### **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2015**

##### **4.1 Planning of the Project Activities**

Investigate the effect of elevated water temperatures on embryonic and early larval development of pompano and groupers (*Epinephelus coioides* and *E. fuscoguttatus*)

##### **4.2 Expected Outputs in 2015**

Embryonic development and early larval survival of pompano and groupers exposed to water temperatures ranging from ambient to 33°C determined.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Healthy and Wholesome Aquaculture  
**Responsible Department:** Aquaculture Department  
**Total Duration:** 2012-2016  
**Funding Sources<sup>1</sup>:** Philippine Government  
**Estimated Budget for 2015:** USD510,000

### 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
- 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
- Economics of producing mudcrab juveniles for soft-shell crab farming identified

---

<sup>1</sup> 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

- 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.

All the activities in this Program are in line with the Resolution and Plan of Action, which were adopted by the Member Countries during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 held in Bangkok in June 2011.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2014

*Investigation on the efficacy of probiotics and rationalization of the needs and application of diagnostics that will ensure biosecurity within culture systems*

Investigation on the application and mode of action of probiotics *Bacillus* species in the larviculture of *Penaeus* was continued. To determine the effects of different levels of intracellular PHB (polyhydrobutyric acid) on the probiotic capacity of *Bacillus* sp., suitable growth conditions that allowed the bacteria to accumulate different levels of intracellular PHB was established. The highest PHB accumulation was observed at 48 h in Luria Bertani (LB) + 2% glucose. In another experiment, the effects of application and mode of action of PHB in the larviculture of *Penaeus* spp. was examined. The practical applications of PHB bioplastics as shrimp shelter and as substrate for microbial colonization/biofilm formation, as well as its biodegradability are currently being investigated.

*Promotion on the wider use of conventional diagnostic as well as new methods for newly reported, emerging diseases*

With regard to the study which aims to investigate the emerging diseases of tilapia in the Philippines, the dominant bacteria isolated from the water, sediment, as well as gills and intestines of the fish were characterized biochemically using the conventional methods and commercial kits. A total 19 bacterial genera and 31 species were identified. The data indicate that bacterial composition in the pond water and sediment accordingly reflects the bacterial composition in the gills and intestine of tilapia. Meanwhile in another study which was initiated only in 2014, the sanitary quality of oysters cultured in major oyster producing areas in the Visayan region is currently being investigated. With regard to the epidemiological study which aims to elucidate on the spread route of shrimp and viral diseases, *P. monodon* tissue samples were collected from shrimp farms in the Philippines and analyzed for the presence of shrimp viruses (WSSV, YHV). In a related study on wild and farmed mud crab, efforts were also continued to identify and describe the diseases affecting the farmed and wild mud crab in 17 mud crab producing provinces in the Philippines. A total of 767 mud crab samples collected from different environments (poly/monocultured pond, aquasilviculture and natural bodies of water) of the 17 Philippine provinces were processed for bacterial, fungal, parasite and viral detection.

Another initiative continued in 2014 was the establishment of a Philippine shrimp pathogen bio-bank and online bio-surveillance information resource. The prototype database software has been developed using Fish Health Section diagnostic data gathered from 2013 to 2014. Pertinent literatures concerning each pathogen are being compiled from available sources. In another study which focuses on molecular diagnosis and prevention of economically important viruses in fish and shrimps, plasmids to be used as

positive control for the shrimp (WSSV, IMNV, and TSV) and fish viruses (VNN [viral nervous necrosis], KHV [koi herpes virus], and RSIV [red sea bream iridovirus]) have already completed.

Concerning the commercially important freshwater fishes in selected Southeast Asian countries, tissue samples of freshwater fishes collected from selected provinces in the Philippines' Region XIII (Caraga) were examined for the presence of fish-borne zoonotic parasites, metacercariae. In another study on abalone, *Haliotis asinina*, continued screening of live hatchery stocks from SEAFDEC/AQD for parasites and shell diseases were done. To examine the infectivity of shell-boring polychaetes present in naturally-infected to healthy abalone, a cohabitation experiment was conducted. Results showed that polychaetes from infected abalones could be transmitted to healthy ones within 48-72 hours post-cohabitation. The infectivity rate of shell-boring polychaetes from naturally-infected to healthy abalone was 60%.

*Finding effective alternative safe drugs/chemicals to manage aquaculture diseases in lieu of harmful chemicals and drugs*

One of the initiatives being undertaken to address this objective involves developing novel strategies to reduce disease incidence in mud crab hatchery and grow-out. Test materials (leaves of terrestrial plants) were obtained locally from different areas in Panay. Among those tested, crude extracts from *Nephelium lappaceum* (Rambutan) and *Terminalia catappa* (Tropical almond tree) showed significant in vitro antibacterial activity against *V. harveyi* and *E. coli* in agar disc diffusion test. Extracts that showed in vitro antimicrobial activity (*T. catappa* and *N. lappaceum*) were further tested for their toxicity to determine the proper dose for in vivo administration in different larval stages of crab. Also in another study, bacterial isolates obtained in 2013 are being tested for their pathogenicity to screen for potential probiotics. Pathogenicity tests were conducted for different stages and sizes of the mangrove crab *Scylla serrata*. Determination of their efficacy in preventing/alleviating bacterial infection in different crab larval stages will follow. Apart from these studies, experiments were continued to examine the practical applications of the developed techniques for vaccinating crabs and other crustaceans to reduce the incidence of diseases during hatchery and grow-out.

Concerning the commercially important mariculture fish, studies were implemented to establish the novel prophylactic and therapeutic methods for the prevention of bacterial and viral infections. *Ulva pertusa* crude ethanolic extract was found to possess potent antibacterial activity against *Aeromonas hydrophila* and *A. sobria*, which are known fish pathogens. The pathogenicity of *A. hydrophila* isolated from the intestine of tilapia, which will be eventually used as fish pathogen for the experiment on the efficacy of *U. pertusa*, was also examined. In another study, immunization regimen is being established to prevent the onset of viral nervous necrosis (VNN) in high-value marine broodfish. Current data corroborate with the supposition that annual booster vaccination of pompano broodstocks reared in floating net cages could immunogenically mount the production of NNV-neutralizing antibodies in these fish, thereby giving protection against horizontal and vertical transmission of the NNV to their offspring. This finding demonstrates the practicality of maintaining VNN-specific-free pompano broodstocks reared in floating net cages in the open sea through vaccination regimen.

*Finding different sources of fish meal substitutes and development of effective feed management schemes that incorporate sound management*

AQD has continued to provide greater focus in addressing this objective through various studies. One of such studies was the optimization of the feeding and management strategies of growing milkfish in marine floating net cages and brackishwater ponds using improved milkfish practical feed with optimum inclusion of soybean meal and soy protein concentrate. The inclusion of these ingredients as alternative to fish meal in practical diets for milkfish resulted in average body weight gain of 82g and mean weight of 321% compared to those given the commercial diet which resulted in average body weight of 54.5g and mean weight gain of 221%. In another experiment which also aims to improve feed formulation for milkfish culture in ponds and cages, the incorporation of cowpea and mung bean resulted in higher growth rate (average body weight of 254g and mean weight gain 209% for the cowpea diet; average body weight of 251g and mean weight gain of 203% for the mung bean diet) as compared to those given the commercial diet (average body weight of 208g and mean weight gain of 190%). Apart from these plant protein sources, another experiment tested the use of distillers dried grain with soluble (DDGS) as protein

ingredient for milkfish diets. Results showed that DDGS can replace up to 15% of protein from fish meal. Histological analyses of the digestive tract of milkfish showed normal structures in the dietary treatment.

Efforts were also continued to improve the nutritional value of locally available feed resources by fermentation. Growth experiments showed best growth and survival rates in the control diet and diets with fermented cowpea. In another study, experiments were done to evaluate the milkfish by-product hydrolysate as ingredient in juvenile grouper, *Epinephelus coioides* diets. Milkfish offals hydrolyzed using a commercially available enzyme (AP-10 *Bacillus subtilis*) resulted in a crude protein content of 61% and a yield of 21%. Growth experiments showed higher weight gain with grouper fed diets with hydrolysate incorporation.

With regard to mud crab, the testing of various attractants to improve feeds and management practices for grow-out culture showed positive results for marine based attractants such as ascetes, squid meal, shrimp paste and spoiled fish flesh. Purified attractants such as putrescine also showed positive results in both high (3%) and low (1%) levels while cadaverine showed positive results only at high levels. For giant freshwater prawn, *M. rosenbergii*, the effects of feed management strategies and periphyton-based production on production of giant freshwater prawn cultured in cages in Laguna lake were assessed. Results showed that the presence of substrate significantly improved the growth rate across all feed rations (2,4,8 and 15% of biomass equivalent).

*Development of aquafeeds for selected species at specific growth stages especially for species or stages for which no artificial feed has been formulated*

The golden pompano, *Trachinotus blochii*, is one of the test species that is being assessed to address this objective. Highest % weight gain, specific growth rate and lowest feed conversion ratio were noted with pompano given feed with the highest crude protein level (55%) and supplemented with amino acids. Apart from experiments on golden pompano, the existing feed formulation for grow-out of mud crab is being evaluated. Basal diet for mud crab was identified to contain 48% CP, 8% CF and a dietary energy of 1723MJ/kg diet. Crab fed feeds with synthetic binders increased in size after molting in both sexes. Another species tested to address the objective is the tropical abalone, *H. asinina*. The old (original) and improved/refined diet formulations for grow-out stage were evaluated. Results showed highest shell length increase of 28-30% for the stocks given the refined formulated diet compared to the 17-18% for the stocks fed the old (original) diet.

*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*

Various studies are being implemented to address this objective. Separate semi-intensive grow-out experiments were continued to assess the economic feasibility of rearing grouper and rabbitfish in brackishwater ponds using either commercial diet or AQD-formulated diets. With regard to mud crab, pond trials were done to develop the protocols for production of hatchery-reared mud crab juveniles for soft-shell crab farming. Concerning the shrimp, *P. indicus*, the performance of hatchery-bred and wild stocks during grow-out was compared. The other demonstration trial conducted was on Nile tilapia in cages in Laguna de Bay. The practical and eco-friendly supplemental feeding schedules were evaluated. The best feeding scheme observed was full feeding after 160 days of culture followed by 45 and 75 days to harvest.

#### **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2015**

##### **4.1. Planning of the Project Activities**

- Research on fishmeal substitutes for feed formulations.
- Studies on effective feeding management and strategies for milkfish and other species.
- Studies on feed formulation refinements.
- Transfer of technology package of available feed formulations through on-line course on aquaculture nutrition.

- Development and evaluation of practical feeds/diets for specific species and growth stages (*i.e.* seahorse, pompano, mud crab, abalone, grouper, tilapia, freshwater prawn, *P. monodon* and *P. vannamei*).
- Refinement of abalone grow-out diet.
- Development of shrimp probiotics.
- Development of alternative protocols for the culture of shrimps to minimize occurrence of diseases like WSSV, EMS, etc.
- Establishment of sanitary quality of oysters.
- Analyses of bacterial microbiota of tilapia cultured in earthen ponds.
- Development of novel strategies to reduce disease incidence in mud crab hatchery and grow-out.
- Development of vaccines against important viral pathogens for the grow-out of freshwater and marine species and crustaceans.
- Establishment of the Philippine shrimp pathogen biobank and online bio-surveillance information resource.
- Establishment of protective measures against persistent and emerging diseases of tropical fish.
- Training of fish health specialists on fish disease and diagnostics.
- Effect of immunostimulant-containing diets on growth, survival, non-specific immune parameters and resistance to stress and infection in milkfish.

<b>Major program activity</b>	<b>Duration</b>	<b>Remarks</b>
Evaluation of different sources of fish meal substitutes and development of effective feeding strategies that may incorporate sound environmental management	Continuing	-
Development and improvement of feed formulations for various commodities at different growth stages and culture environments	Continuing	One of the studies that will be continued is the improvement of feed formulation for milkfish culture in ponds and cages (DOST-UPV <sup>2</sup> funded study)
Pilot-scale production of pellets suitable for mud crab	2013-2015	Pilot-testing of extruded diets with right shape, binder and appropriate attractants will be conducted
Testing of refined feeds for the grow-out culture of refined abalone in land-based tanks: Use of binders and application of different feed forms	2014-2015	Confirmatory run of the same land-based tanks and possibly in sea cages in 2015
Evaluation of practical and eco-friendly supplemental feeding schedule for Nile tilapia in cages in Laguna de Bay	2014-2015	-
Evaluation of the effects of immune-stimulant-containing diets on growth and survival of milkfish, Nile tilapia	2014-2015	-
Development of shrimp pathogen diagnostic tools using nested PCR and lateral flow strip biosensors coupled with a mobile app and cloud-based information management	2014-2016	DOST funded study. This study will continue in 2015.
Establishment of a Philippine shrimp pathogen bio-bank and online biosurveillance information resource	2014-2016	DOST funded study. This study will continue in 2015.
Novel strategies to reduce disease incidence in mudcrab hatchery and grow-out	2013-2015	DOST funded study. This study will continue in 2015
Epidemiological study and elucidation on spread route of shrimp viral diseases in SEAsian countries	2012-2015	JIRCAS funded study.
Establishment of sanitary quality of oysters ( <i>Crassostrea iredalei</i> ) and their culture environments	2014-2017	DOST funded study.
Quantitative and qualitative analyses of the bacterial microbiota of tilapia ( <i>Oreochromis niloticus</i> ) cultured in	2013-2015	DOST-NRCP funded study. To be continued in 2015.

<sup>2</sup> Department of Science and Technology-University of the Philippines in the Visayas

Major program activity	Duration	Remarks
earthen ponds as tool for investigating emerging and reemerging diseases of tilapia in the Philippines		
The application and mode of action of probiotic <i>Bacillus</i> species in the larviculture of <i>Penaeus</i>	2012-2015	International Foundation for Science (IFS) funded study. This study will continue in 2015.
Development and acceleration of rapid and effective fish and shrimp health management	2015-2019 (5 years)	New study under GOJ-TF6
Enhancement of vaccine efficacy for the prevention of viral nervous necrosis in high value marine fish	2015-2019 (5 years)	New study under GOJ-TF6
Application of adjuvants, carriers and RNAi technology to enhance the antiviral immune response of shrimp to WSSV	2015-2019 (5 years)	New study under GOJ-TF6 project.
Establishment of protective measures against persistent and emerging parasitic diseases of tropical fish	2015-2019 (5 years)	New study under GOJ-TF6 project.
Epidemiology of the Early Mortality Syndrome (EMS)	2015-2019 (5 years)	New study under GOJ-TF6 project.
Technology extension and demonstration	2015-2019 (5 years)	New study under GOJ-TF6 project.

### Expected Outputs

- Additional fishmeal substitutes for various AQD formulated diets identified with the corresponding % protein replacement.
- Effective feeding management schemes that may incorporate sound environmental management developed and improved for different species of fish.
- Efficient grow-out diet for pompano developed.
- Efficient grow-out diet for abalone refined and verified.
- Grow-out culture of grouper, pompano, rabbitfish in brackishwater ponds with practical feed demonstrated in private ponds of collaborators.
- Performance of hatchery reared crabs in soft-shell crab farming determined.
- Appropriate stocking densities, right protocols, cost of production for grow-out culture of pompano in cages developed.
- Use of SEAFDEC/AQD formulated feeds for nursery rearing of pompano in cages verified.
- Epidemiological information on shrimp diseases compiled.
- Aquatic pathogen biobank established.
- Online Philippine shrimp pathogen database resource established.
- Generated data on shrimp farming practices in relation to YHV.
- Field efficacy of inactivated developed NNV vaccine examined; inactivated NNV vaccine with immune-adjuvant developed and produced *in vitro*.
- Bacteria from diseased tilapia reared in hatchery and nursery ponds isolated, identified and their pathogenicity elucidated.
- Persistent and emerging parasites affecting net-caged and pond-reared tropical fishes identified.
- Oyster culture sites examined and classified according to EU Oyster Harvesting Areas Classification.
- Training needs for capacity building of SEAFDEC Member Countries on fish health identified.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Maintaining Environmental Integrity through Responsible Aquaculture

**Responsible Department:** SEAFDEC Aquaculture Department (SEAFDEC/AQD)

**Total Duration:** 2012-2016

**Funding Sources<sup>1</sup>:** Philippine Government

**Estimated Budget for 2015:** USD 80,000

### 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 waste 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
- Appropriate culture protocols in ponds, pens in ponds and other systems for sandfish determined

---

<sup>1</sup> Supplemental funds are also provided by JIRCAS, ACIAR



- 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 2014

- a) *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 different stations of SEAFDEC/AQD are undergoing regular monitoring with the following accomplishments.

- Igang Marine Station (IMS) and its surrounding area: The bathymetric profile of various stations incorporating seagrass and coral cover information has been completed. Sediment size analyses have also been completed. The biodiversity of the various ecosystem types as well as near the cage set-up has been determined with 805 species in 292 families in 20 major taxa identified. Benthic fauna inventory revealed a total of 151 individuals of 51 unique taxa.
- Tigbauan Main Station (TMS): Sampling of the shore areas around TMS is being conducted. Some 543 species in 203 families in 10 major taxa have been collected or photographed. Work was started on a book on the marine biodiversity in Tigbauan, Iloilo, illustrated mostly with photographs of species harvested by nearshore fisheries. The first draft will be submitted when the study is terminated in December 2014
- Binangonan Freshwater Station (BFS): A comparison of phytoplankton, zooplankton and fish and other vertebrate diversity in two sites around the station, the East Cove (an aquaculture site) and the West Cove (non-aquaculture site) began in March 2013. Biodiversity indices were significantly better in the non-aquaculture site (WC) compared to the aquaculture site (EC). Zooplankton samples from the two sites did not show any significant difference in the various diversity indices determined. No differences in species richness, was observed in both the phytoplankton and zooplankton samples from the two sites. Samples from the fish traps set at the EC and WC showed significantly higher catch from EC than WC. This could be due to the fishermen operating in the open WC daily which resulted in lower biomass caught in the fish trap; whereas the EC is protected from access by open water fishermen. The species caught in the traps were categorized into native species, introduced cultured species, and invasive species (non-aquaculture). In EC specifically, the dominance of introduced cultured species is very evident compared to WC. In WC, invasive alien species tended to be higher than introduced cultured species. Nevertheless, higher dominance of native species in WC was noted compared to EC.

A project on the biodiversity in the milkfish and shrimp fry fishery in the surf zones in southern and western Panay is also being implemented. Twenty-four fry samples from 24 one-hour operation of fry sweepers from 6 fry collection sites were examined and showed 8-36 species of fishes and crustaceans.

b) Identify appropriate extractive species that may be used in **Integrated Multi-Trophic Aquaculture (IMTA)**

Studies on the extractive species for use in IMTA such as the sandfish *Holothura scabra*, the bivalve mollusc *Anodontia philippiana* and the seaweed *Gracillaria bailinae* were completed in 2013.

c) Develop and promote efficient and suitable environment-friendly culture systems

Studies on the culture of the sandfish *Holothuria scabra* is being continued this year. In addition, external funds for abalone *Haliotis asinina* grow-out studies particularly in small islands and communities recently started. Refinement of grow-out techniques for the slipper oyster under Philippine conditions started recently, also with external funding support.

Experiments were conducted to determine optimal conditions for the culture of the sandfish *H. scabra*. In the previous years, substrate type, salinity, and stocking density experiments were done to assess growth and survival of sandfish juveniles. For 2014, results showed that at 30 days of culture. Sandy sediment showed higher growth at  $0.89\text{g}\cdot\text{d}^{-1}$  and survival at 98%, compared with muddy sediment with growth of  $0.73\text{g}\cdot\text{d}^{-1}$  and 92% survival in the selected experimental sites. Another experiment was started in May 2014 on stocking density using 12, 25, and 50  $\text{ind}\cdot\text{m}^{-2}$  using juveniles ( $M=1.06\text{ g}$ ). Initial results showed that growth stocking density dependent with the best growth observed in the lowest stocking density and the poorest growth in the lowest stocking density. Survival on the otherhand was not affected by the aforementioned stocking density which ranged from 88 to 91.5%.

The proposed sea ranching site in Concepcion, Iloilo was hit by typhoon Haiyan (Yolanda) last year and a reassessment of habitat suitability had to be done. No wild sea cucumbers were found in the area a month after Yolanda but another assessment 3 months after showed some recovery where four species of sea cucumbers were found at an estimated combined density of 4 individuals  $\text{ha}^{-1}$ .

Re-assessment of sea ranching site in Concepcion, Iloilo was done to compare the status of the habitat in terms of suitability for sandfish ranching, substrate quality and biota composition after it was hit by typhoon Haiyan. Sea grass cover is still high and dominated by *Enhalus acoroides* but blades were mostly cut after the typhoon. Zoning and delineation of the sea ranching site was done and a draft management plan was formulated with project partners. Construction of markers and monitoring hut/watch tower for the sea ranching site is still in progress in collaboration with the local Small Fisherfolks Association and LGU of Concepcion. Through an Executive Order signed by the Municipal Mayor of Concepcion, a 5-ha pilot sea cucumber sea ranching site at Polopina Island was designated with a Technical Working Group to oversee general management of the area. As part of the project protocol a fixed 49-point environmental monitoring grid was laid out to cover the whole sea ranch site. Gathering of baseline data from this grid has started.

A trial nursery run was started to evaluate the adoptability of AQD's Igang Marine Station nursery design in Concepcion.

A Focus Group Discussion (FGD) was conducted with the local Small Fisherfolks Association to know about the history, activities conducted, challenges faced and the activities currently implemented by the organization. The FGD obtained information on the (1) socio-economic/demographic profile of the participants, (2) structure and membership process and (3) the perceived capacity of members/officers in carrying out their responsibilities.

A survey was conducted on June 16-20, 2014 to collect baseline information from ninety fishers consisting of members and non-members of the local fishers' organization. The questionnaire captured data on fishing activities, collection, utilization and marketing of sea cucumber and perceived impacts of the sandfish sea ranching project as well as the impacts of the Typhoon Haiyan on their household and livelihood activities. A focus group discussion (FGD) and mapping exercise were also conducted to understand the current situation and needs/problems of the community and as bases for planning for appropriate intervention strategies.

For the abalone experiments in both nursery and grow-out tested different types of containers (perforated plastic trays, empty oil containers, polyvinyl chloride tubes and plastic mesh cages) are currently being tested simultaneously in reef flats in Agho Island, Concepcion, Iloilo and in concrete tanks at the Tigbauan Main Station of SEAFDEC/AQD. In the reef flats, abalone nursery reared in trays have the highest survival (98.6%) compared to the other rearing containers with the lowest survival after 3 months in cages. However, those nursed in concrete tanks showed no differences in growth and survival among the different types of containers. In the grow-out, abalone survival and growth in the reef flats after 75 days were highest in trays and tubes (100%) and slightly lower in the other two containers (87-95%). Growth was poorest in cages (0.22 cm/month) and highest in tray (0.55 cm/month). In concrete tanks, survival was comparable among all four types of containers (99-100%) after 90 days of culture, although growth was slowest in the cages at 0.25 cm/month compared to 0.34 to 0.38 cm/month for the other containers. Density trials for the nursery phase were recently started and on-going. Grow-out density trials will commence at the termination of the nursery trials.

To start off the study on oyster, a preliminary assessment of various oyster farms in Panay Island was conducted. Of the sites evaluated, New Washington, Aklan was selected for the project and a Memorandum of Agreement between SEAFDEC/AQD and the Local Government Unit of the chosen site was signed. Oyster spats were collected using experimental rafts with different substrates (recycled motorcycle tires and dried oyster shells). Collected spats were reared in two culture systems: the pouch and the tray. Growth rates obtained for pouch and tray were 1.19 cm mo<sup>-1</sup> and 1.69 cm mo<sup>-1</sup>, respectively. Actual experiment will commence upon completion of fabrication of pouches and trays. Grow-out trial will use tires, hanging oyster shells, pouches and trays.

*d) Conduct biological and ecological studies on species with potentials for resource enhancement*

The studies on *Tridacna gigas* have been completed. The stock enhancement of mud crab and the community managed sea ranching and stock release of sandfish *Holothuria scabra* are also underway. These two studies are part of the GOJ-funded initiatives under the Sustainable Aquaculture Program; hence, will not be presented here.

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	On-going; To be completed end of 2014
Marine biodiversity around the SEAFDEC Aquaculture Department in Tigbauan, Iloilo	2013-2014	To be completed end of 2014
Impact of aquaculture in a freshwater environment: Biodiversity of aquatic fauna at the east and west cove of the Binangonan Freshwater Station	2013-2015	To be completed by first quarter of 2015
Biodiversity in the milkfish and shrimp fry (semilya) fishery in the surf zones in southern and western Panay	2013-2014	To be completed end of 2014
Objective: <i>Identify appropriate extractive species that may be used in Integrated Multi-Trophic Aquaculture (IMTA); No activities</i>		
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
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)*		Reported under GOJ-TF Stock Enhancement Program
Community managed sandfish ( <i>Holothuria scabra</i> ) sea ranching and stock release*		Reported under GOJ-TF Stock Enhancement Program

\*under GOJ-TF; (not covered in this report)

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2015

##### 4.1 Planning of the Project Activities

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	2015-2016	New
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 Philippine Department of Science and Technology (DOST)
Refinement of existing oyster grow-out techniques	2014-2017	To continue; funded by DOST
Objective: <i>Conduct biological and ecological studies on species with potentials for resource enhancement</i>		

##### 4.2 Expected Outcomes/Outputs

- Documentation of marine biodiversity in the marine habitats adjoining AQD's Tigbauan Main Station  
- publication of book and scientific paper on marine biodiversity based on study findings
- Biodiversity of the East and West Coves of Tapao Point of the Binangonan Freshwater Station determined; Impact of aquaculture on biodiversity at the Station's lake-based facilities determined
- Documentation of species biodiversity in the fry fishery in southern and western Panay
- Community-based sandfish sea ranch site established
- Appropriate container for nursery and grow-out culture of abalone, *Haliotis asinina* determined
- Grow-out characteristics of oysters in different sites determined

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Meeting Social and Economic Challenges in Aquaculture

**Responsible Department:** Aquaculture Department

**Total Duration:** 2012-2016

**Funding Sources<sup>1</sup>:** Philippine Government

**Estimated Budget for 2015:** USD 91,000

### 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 Fish for All Conference 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 socioeconomic 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 socioeconomic conditions of the rural communities and small-holder farmers; and
- Establishment of social science regional network initiated

---

<sup>1</sup> 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 Fish for the People Conference. These issues define the scope and coverage of the 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 inter-disciplinary 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 2014

*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*

For freshwater aquaculture, a third on-farm demonstration run of grow-out culture of giant freshwater prawn (GFP), *M. rosenbergii*, in polyculture with tilapia in net cages in Laguna Lake was conducted. In view of the continuous consumer demand and the modest income derived year-round from tilapia culture, tilapia growers have reiterated their interest in this activity. They also expressed interest in adopting GFP culture if this is done in polyculture with tilapia. The studies that address Objective 1 have demonstrated that new aquaculture technologies such as the grow-out culture of GFP in cages in Laguna Lake can be integrated either with existing tilapia fingerling or grow-out production that already provide modest incomes to fish farmers. The GFP will provide additional income without incurring additional feeds if co-cultured with tilapia.

The stock enhancement of marine species such as abalone, *H. asinina*, and tiger prawn, *P. monodon*, is continued through community-based strategies. Abalones were released starting in June 2011 and since August 2013, regulated harvesting following 6 cm shell length catch-size regulation has been practiced by the local fisherfolk in Barangay Molocaboc within the Sagay Marine Reserve (SMR) in Negros Occidental. The fisherfolk BFARMC organization who participated and protected the stock enhancement demonstration site and other gleaners who did not directly participate in the project altogether have continued to benefit from regulated harvesting of mature >6 cm shell length abalones in the intertidal flats of Barangay Molocaboc. In another study conducted in New Washington, Aklan province, three runs and release of tiger prawns, were done in collaboration with the fisherfolks of Brgy Pinamuk-an. The improvement of survival rates (now at 44% )during the intermediate culture phase and reports of catching tagged shrimps have motivated fisherfolks to participate in culture and future release activities. These studies have demonstrated that in both locations in Sagay and New Washington, more information, education and communication activities, as well as support fisheries regulations and policies are needed to sustain benefits from stock enhancement.

*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*

On allocating R&D resources to address emerging issues due to climate change and global trade, the potential applications of income-generating but eco-friendly culture technologies such as the integrated multi-trophic aquaculture (IMTA) in milkfish mariculture is being evaluated in a survey of milkfish cage and pen owners in three regional sites. The survey in Region 1 in Lingayen Gulf was completed with indications that the IMTA concept is acceptable among large-scale mariculture operators due to ecological and economic benefits but cage design and sources of seeds of co-cultured species such as sea cucumber, oyster, mussel and seaweeds are a major concern. The survey in mariculture areas in Bohol and Davao will follow. Similarly, a socioeconomic assessment of the highly threatened ecology such as Napoleon wrasse fishery in Bohol island in central Philippines was started recently to complement a study on seed production of this species.

*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*

On enhancing multi-agency collaboration at the local and international level, the Program likewise collaborated and contributed to the FAO-AFSPAN project by conducting required surveys and studies following FAO-prescribed formats that investigate the role of aquaculture in poverty alleviation, food security and nutrition. Most recently, AQD has collaborated with a local private company to conduct a market, industry and consumption study of selected high-value indigenous species in order to assess the needs and potentials of future R&D investments in seed production and culture of these species.

#### **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2015**

##### **4.1 Planning of the Project Activities**

Promotion of giant freshwater prawn hatchery technology will be conducted initially with fisherfolks in Barangay Pipindan in Laguna Lake. The existing small-holder tilapia fingerling and grow-out business operators in this locality will be given hands-on training on tilapia seed production at AQD's Binangonan Freshwater Station to enable them to produce their own seeds for polyculture (tilapia and freshwater prawn) in their own farms.

The community-based stock enhancement study on abalone in Sagay Marine Reserve, Barangay Molocaboc will be continued. The success of the study will be complemented by the establishment of solar-powered small-scale hatchery in a remote island fishing community without electricity.

Studies on the community-based coastal area capability development through stock enhancement of tiger prawns will also be continued. Participating community will rear and release more shrimps in collaboration with other stakeholders, under regulated conditions following ordinances owned and supported by participating stakeholders.

The findings of the ex-ante study on IMTA in milkfish mariculture will be validated with stakeholders. These will also be tested in on-farm demonstration site, in collaboration with representative mariculture operators.

The Program will also conduct the market, industry and consumption study of high-value indigenous species to evaluate their potentials for further R&D investments.

##### **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 socioeconomic and governance strategies for coastal communities in the Sagay, Negros Occidental developed.
- 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.
- Market, industry and consumption study of high value indigenous species in the Philippines initiated.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs  
**Project Title:** Quality Seed for Sustainable Aquaculture  
**Responsible Department:** SEAFDEC/AQD  
**Total Duration:** 2012-2016  
**Funding Sources<sup>1</sup>:** Philippine Government  
**Estimated Budget for 2015:** USD 680,000

### 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:

- 1) develop good quality broodstock for both traditional and emerging species
- 2) improve quality and production of seedstock through the refinement of hatchery and nursery management methods;
- 3) develop schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks;
- 4) produce sufficient seedstock through the adoption of economically viable seed production systems; and
- 5) build the capability of fishfarmers and other industry stakeholders in appropriate breeding and larval rearing technologies through training, extension and information dissemination

#### 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; and
- Capacity of fish farmers and industry stakeholders in appropriate breeding and larval rearing technologies enhanced.

#### 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

---

<sup>1</sup> Supplemental funds are also provided by other donors such as the Philippine's Department of Science and Technology, JIRCAS, GOJ-Trust Fund, ACIAR, etc.



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-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 2014

#### A. *Development of good quality broodstock and implementation of proper stock management protocols*

Good quality spawners/breeders are important both for foodfish production and for production of seeds for stock release and conservation. Stocks for both purposes must both be genetically diverse to ensure fitness when farmed/released in specific environments. The following are the accomplishments for all the R&D activities that address the first objective.

##### *Commercial species*

Two consecutive generations of shrimps were grown as broodstock as part of the study on the development of techniques for the sustainable production of good quality captive *P. monodon* breeders. The reproductive performance of both F<sub>1</sub> and F<sub>2</sub> generation broodstock were not consistent in terms of percentage maturation, successful spawning and fecundity. As regards the ideal stocking density for rearing shrimps to broodstock size, higher survival were obtained for stocks reared at 0.25 individuals/m<sup>2</sup> while broodstock size was obtained within 1.5-2.5 months for those stocked at lower densities of 0.5 and 0.25 individuals/m<sup>2</sup>.

Molecular markers that will identify stocks and consequently aid in determining genetic quality are currently being developed for several commercial aquaculture species. Development of quality shrimp, milkfish, abalone and oyster broodstock, through conventional stock monitoring and management protocols, is being conducted by AQD in collaboration with the University of the Philippines and Japan's Tohoku University. Samples from potential shrimp broodstock from various Philippine sites (Zamboanga, Surigao, Palawan, Zambales, Bohol, Himamaylan, Digos, Roxas, Ozamis and Masbate) were collected and have been genetically characterized. Molecular marker-based broodstock management method is also being adopted for the Philippine milkfish *Chanos chanos* stocks. Results of the preliminary screening of genetic diversity in stocks obtained from Bohol, BFAR Palawan, Dagupan and SEAFDEC/AQD Iloilo showed similar levels of expected heterozygosity ranging from 0.678 to 0.703. Twelve remaining stocks need to be genetically characterized and once complete, data on the genetic differences among these stocks and information on the best possible sources of milkfish broodstock shall have been known. As for the abalone, stocks from Pangasinan, Palawan, Zamboanga del Sur and Masbate have been collected and five families per stock are being produced for genetic and production characteristics assessments.

Apart from genetic intervention, nutritional methods to improve egg production and quality have been done by way of the inclusion of pigments in the diet. A maturation diet for grouper (*E. fuscoguttatus*) has been formulated using a natural pigment such as paprika and feeding trials on its effect on seed quality and production was monitored. Mature oocytes and spermiating males were observed in treatments with pigments (paprika and beta carotene) while no spermiating male was observed in the control.

To improve reproduction in the donkey's ear abalone, maturation diets are currently being assessed. The nutrient composition of eggs from wild-sourced abalone and those from hatchery-bred stocks were identified. Dietary formulations with varying levels of protein/energy have been done and their effects on abalone reproductive performance were tested using wild and hatchery conditioned broodstock. Reproductive performance of hatchery-bred abalone broodstock generally improved with an increase in dietary protein energy levels from 27% CP/3210 kcal/kg energy to 37%CP/3350 kcal/kg energy. Lower spawning success correlates well with the lower amount of protein and lipid in the egg. A shorter time to

maturity was noted with broodstock given formulated diets containing higher protein /energy levels. Moreover, egg hatchability increased with increased lipid level notwithstanding the different lipid sources used. It has been noted also that higher levels of dietary HUFAs and PUFAs correlate well with better reproductive performance.

Efficient low-pollution diets for use in rearing potential freshwater prawn broodstock are being developed and tested. Grow-out diets were prepared to be isonitrogenous (35% crude protein) and isocaloric (346-350 kcal/100 g diet). These diets were used for the tank and lake-based grow-out culture of *M. rosenbergii* postlarvae (PL). Broodstock diets were also formulated to be isonitrogenous (38%) and isocaloric (378 kcal/100 g diet). Sardine fishmeal was replaced with cowpea meal at varying levels in grow-out and broodstock diets. Feeding trials in lake-based cages showed that specific growth rate (4.52–5.00%/day) and survival rate were not affected by the replacement of cowpea meal protein level in the test diets. Prawns fed commercial prawn diet had survival rate (64%), mean body weight (13.98 g) and specific growth rate (4.73%/day) comparable to the performance of the test diets. Cowpea meal as a replacement for fishmeal has been noted to be acceptable for freshwater prawns when incorporated up to levels of 45%. The economic viability of the use of this alternative protein source shall be determined.

Meanwhile, giant freshwater prawn spawners stocked in tanks at 1M:4F sex and fed treatment broodstock diets showed that after 72 days, prawns fed Diet 1 (0% replacement) had the lowest survival (75%), which was significantly different from the prawns fed Diets 2-4 (~92%). The percentage of berried females was highest in Diet 3 and 4 (92%), followed by Diet 1 (75%), and lowest in Diet 2 (50%). Fecundity increased with increasing levels of cowpea meal in the diet. The females produced on average from 1,462 to 3,147 larvae per hatching event. The average number of newly-hatched larvae varied from 135 larvae g<sup>-1</sup> female in prawns fed Diet 1 to 331 larvae g<sup>-1</sup> female in prawns fed Diet 4. However larval rearing trials resulted in complete mortality after two weeks. Breeding and larval rearing trials have continued.

The sustainable production of marine annelids (*Marphysa mossambica*) was pursued as these serve as potential feed for mud crab broodstock. The reproductive biology and life cycle of the marine annelid have been defined. Moreover various feed combinations of live annelid and annelid meal as feed for mud crab broodstock have been evaluated to improve reproductive performance. Test diets have been prepared and maturing females are now being fed with test diets while maturing females are being prepared for the next run.

In the oyster, *Crassostrea irredalei*, protocols for broodstock management and conditioning are being developed to maximize production. Preliminary data showed that broodstock reared semi-intensively in ponds, estuaries and tanks, given 200,000 cells/ml of microalgae (3 cells *Isochrysis galbana*: 1 cell *Tetraselmis tetrahele*) resulted to faster gonadal development.

#### *Species for stock management and enhancement*

The Napoleon wrasse *Cheilinus undulatus* is a subject of research at AQD primarily to understand its reproductive biology and consequently enable the production of seedstock for use in stock enhancement activities. Efforts to develop broodstock of Napoleon wrasse have not been successful due to difficulty in stock collection. Meanwhile, 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.

#### *B. Refinement of hatchery and nursery management methods to improve seedstock quality and production*

##### *Commercial aquaculture species*

Trials were made to determine the appropriate hormone concentrations to induce spawning in the spotted scat. Fish spawned at two successive injections for the treatments of 100ug LHRHa/kg BW and 200ug LHRHa/kg BW at 24-hour intervals but unfortunately no fertilization occurred.

In the pompano *Trachinotus blochii* (Lacepede), optimum conditions for breeding and seed production were determined. Probiotic addition to live food improved growth and survival of pompano larvae. The

enhancement likewise improved larval resistance to stress such as hypoxia and stimulated digestive enzyme activities.

Protocols for the nursery rearing of pompano in cages have been developed. Nursery trials using pompano of different initial size at stocking showed that better growth was observed in fish stocked at <5g when fed dedicated a pompano diet. Comparable growth was noted in bigger size fry fed either pompano feed or a generic high value fish feed. When stocked at 1500 and 2000/cage, comparable growth, survival and duration of culture to reach 50g were noted in the two stocking densities. Costs for production under the various interventions are being noted to enable determination of the most suitable, cost-effective seed production scheme.

For milkfish, feeding trials involving a comparison in the reproductive traits of broodstock fed fortified vs non-fortified (control) diets were conducted. Fortified diets meant inclusion of phospholipids, carotenoids, vitamin C, beta-carotene and arachidonic acid. It was noted that more spawning episodes were observed in young milkfish broodstock fed fortified diets compared to the old stocks (17-29 year old). On the other hand, older stocks fed fortified diets produced longer fry but those produced from young breeders showed higher fry survival. Questionnaires on fry quality assessment are being sent off to clients to determine whether they are satisfied with the seedstock produced by the SEAFDEC/AQD hatchery.

To improve the seed yield of selected high value marine fish species such as grouper, red snapper, seabass, rabbitfish and pompano, sodium-iodide enriched rotifers and *Artemia* were used as feed for larvae. Metamorphosis and survival of the same high value species were noted. It was observed that improved survival rate for red snapper when fed sodium iodide enriched rotifer (for 16 hours) and *Artemia*. Snapper fed sodium iodide enriched rotifer metamorphose earlier than those fed enriched *Artemia*.

*Cocconeis* sp, *Nitzschia* sp and *Diploneis* sp have been used as alternative benthic diatom feed species for the hatchery rearing of abalone. Feeding preference experiments involving abalone juveniles were conducted. After 48 hours, the highest percent incidence of juveniles (20.8% juveniles h<sup>-1</sup>) moved to plates with *Nitzschia* sp, followed by *Cocconeis* sp, *N. ramossisima*, *Amphora* and finally *Diploneis* sp. but among the five natural food organisms, gut analysis showed that *Amphora* sp was highly digestible (27.49%). It was also noted that significantly higher growth rate was observed in abalones fed *Amphora* sp.

Another nutritional intervention to improve abalone hatchery production is 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). The use of MPD in 2-ton fiberglass tanks in the abalone nursery showed high % settlement rate (at 37%) with larvae from Sagay abalone broodstock compared to hatchery-bred larvae (25%). Feeding frequency trials in big tanks showed that daily feeding is needed to sustain abalone survival in the nursery rearing phase. Meanwhile, in another experiment which aimed to increase the survival rate of abalone veliger larvae through the improvement of harvest, stocking density and incubation protocols, it was noted that the highest veliger survival (80%) was attained at 5ml<sup>-1</sup> stocking density and regardless of stocking density, larval survival decreased at extended incubation time (16-24h).

In the oyster, different spawning techniques are being compared to determine the optimal method that can provide a steady production of quality oyster seedstock. All methods (dessication, thermal and exposure to UV-irradiated water) induced oysters to spawn but a faster response (15 min) was noted in the thermally manipulated batch with a higher number of eggs released per mass spawning batch. When larval rearing performance in tanks subjected to partial flow-through and/or static water was compared, survival was noted to be higher in static water culture. Finally, feeding *Isochrysis galbana* alone to oyster larvae gave better survival compared to combination feeding with *Chaetoceros calcitrans* or *Chaetoceros calcitrans* alone.

Efforts have been made to further improve mudcrab hatchery schemes. Enhanced larval growth performance was noted in a diet composed of 1% squid meal and 1% annelid meal. Molt death syndrome (MDS) was lower in larvae fed formulated diet plus natural food. As regards the use of antibiotics,

experiments on the application of antibiotics, antimicrobial nitrofurans and probiotics in larval rearing were conducted. Larvae treated with antibiotics commonly used in the hatchery still gave the best result since antibiotic treated larvae survived the longest (10 days) compared to the other treatments.

The influence of stocking density and tryptophan diets on the survival and growth of mudcrab *Scylla serrata* in the nursery phase is being determined. Based on stocking density, crabs reared for 4 weeks at 30/m<sup>2</sup> had higher survival (59.7% vs. 47.6%) than those stocked at 50/m<sup>2</sup>. On the other hand, crabs fed mussel and basal artificial diet survived better (57.7%) than those fed mussel alone or mussel and artificial diet with 0.5 to 0.75% tryptophan. In another experiment, crabs stocked at 5/m<sup>2</sup> and 10/m<sup>2</sup> and subjected to the same feeding regimes, survived better in the mussel and basal artificial diet combination. Survival on the other hand was better in a lower stocking density of 5/m<sup>2</sup> than at 10/m<sup>2</sup>. It was noted that tryptophan did little to reduce incidence of cannibalism. Meanwhile, in determining the optimal feeding ratio of natural food (NF) to artificial diet (AD) that can be used during the 1<sup>st</sup> and 2<sup>nd</sup> mudcrab nursery phases, higher survival rates (64-69%) were noted in the diet combinations NF:AD of 15:85, 20:80, 25:75 and 30:70. However 100% AD also gave a good survival rate. Survival rates ranging from 80-90% in NF:AD combinations were higher than feeding singly with either NF or AD. As regards cannibalism in mudcrabs, strategies for the reduction of cannibalism have been assessed. Net ribbon shelters were observed to be best in controlling cannibalism in mudcrabs than the *Gracilaria*, nets in zigzag and plastic ties. This evaluation, when done at low densities of 30/m<sup>2</sup>, showed higher survival and growth. When claw-trimmed and autotomized crablets were compared with intact crablets, survival was similar between intact crablets and claw-trimmed ones.

Apart from mudcrabs, larval studies have been done on the blue swimming crab (BSC) *Portunus portunus*. BSC larvae were fed commercially available shrimp diets. Results showed that natural food and BP Nippai gave the highest survival and growth index followed by those fed natural food plus *P. japonicus* or *P. monodon*. Antibiotics have also been tested to evaluate its impact in BSC larval production. Survival from zoea 1 to megalopa was highest in those treated with furazolidine (0.2 ppm), every other day (9.58%). Zoea did not reach megalopa without antibiotics. In the confirmatory run, larvae with furazolidine applied daily (9.38%) or every 5 days (7.29%) had higher survival than those larvae with oxytetracycline after every 5 days (5.63%) and daily water change (5.42%). Megalopae were produced (3.96%) even without antibiotics indicating that megalopae can still be produced depending on the quality of the larvae.

For BSC nursery production, initial responses showed that bigger crab instars show high mortality at 8ppt. when laboratory scale tests comparing survival and molt frequencies at 8-32ppt salinity levels were conducted. To improve the nursery production of the BSC, the optimal stocking density was determined in the two nursery phases. Survival rate of 37% was obtained in the lowest stock density of 300 ind/ton for phase 1. For phase 2, the optimal stocking density in tanks was noted to be 200 individuals /ton. When reared in netcages, survival was best at 54% in 30 individuals/m<sup>2</sup> for phase 1 and 80% for stocks reared at 10 individuals/m<sup>2</sup> for phase 2 rearing.

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. *Kappaphycus* nursed in land based enclosures gave 90-100% survival at a specific growth rate (SGR) of 1.5% while those reared in sea-based cages survived at a rate of 23-50% with and SGR of 3%. Efforts to outplant tissue culture explants are currently being undertaken in Bohol, Zamboanga, Guimaras and Antique.

#### *Emerging species for aquaculture*

Silver perch *Leiopotherapon plumbeus* is a promising species for commercial inland aquaculture particularly because it is an indigenous species and it commands a good market price. This year, two rotifer strains (*Brachionus rotundiformis* and *B. plicatilis*) were tested as starter food for first feeding larvae. Silver perch larvae fed *B. rotundiformis* had higher survival compared to those fed *B. rotundiformis* and *Moina* sp. Another species, the *Proales similis*, shall later be evaluated as potential starter food for silver perch as well.

Improvements in the hatchery and nursery production of sandfish *Holothuria scabra* have been undertaken. Refinements in the nursery protocol included modification of the floating hapa nursery design and determination of the optimal stocking density. PVC pipes instead of bamboo framed modules increased ease of maintenance and monitoring of sandfish in nursery cages. Stocking densities of 30, 60, 90, 125 and 250/m<sup>2</sup> cage showed that survival was highest in the lowest stock density of 30/m<sup>2</sup>. Nursery runs are likewise being conducted in three different sites (floating hapas in Igang, Guimaras, in a protected cove in Ajuy, Iloilo and in an open bay in Concepcion, Iloilo). Of the three, the protected cove shows good prospects for nursery rearing.

#### *Species for stock enhancement*

The seahorses, *Hippocampus barbouri* and *H. comes* are continuously being propagated in the SEAFDEC/AQD hatchery for possible stock release. Prior to seed production for stock release, genetic analysis of the different seahorse species are being pursued. Tissue samples from seahorses collected from Molocaboc Island in Sagay City and a seahorse hatchery in Japan have been analysed for genetic characterization. Species-specific primers HiSpiF1 and HiBarF1 were confirmed for species identification of *H. spinosissimus* and *H. barbouri*. Meanwhile another marker system (mtDNA RFLP) was tried and species diagnostic RFLPs were identified mainly for *H. comes*.

#### *C. Development of schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks*

##### *Commercial species*

Selective breeding programs have commenced for selected crustaceans with support from the Government of Japan Trust Fund (for mudcrab, shrimps and freshwater prawns), SEAFDEC/AQD and the Philippine Department of Science and Technology (for shrimp and the mudcrab). For the mudcrab, stress tests (particularly formalin tolerance and disease challenge response tests) were done to determine strain level differences in the effort of identifying stocks with better fitness attributes. Details on the shrimp and mudcrab studies are not included here but are covered in the GOJ-TF report.

For the giant freshwater prawn, the approach for genetic improvement is to assess and determine the effective broodstock management scheme to enhance growth and/or reproductive performance. This year, potential broodstocks from two sources, Calumpit, Bulacan and Pampanga River were used for growth and reproductive performance comparison. Broodstock management methods namely: a) reciprocal crossing between stocks from the same site but obtained in different periods and b) optimal sex ratio have shown some improvement in terms of growth in the domesticated strains. Reciprocal “hybrids” used as broodstock seem to have a positive effect on the performance of the progenies when tested for growth...

Hybridization is currently being done on the local commercial abalone species (*Haliotis asinina*) by crossing this with other Philippine abalone species, *H. planata* and *H. glabra*, to enable the production of stocks/species with improved traits. After 210 days of culture, specific growth rate was not significantly different between pure *H. asinina*, hybrid *H. asinina* x *H. planata* and *H. asinina* x *H. glabra*. Survival was highest for the pure *H. asinina*, followed by *H. glabra* hybrid and *H. planata* hybrid. The third hybrid HAFVM (cross of female *H. asinina* and male *H. varia*) is currently being maintained.

To address Ice-ice disease in seaweeds, methods to develop resistant strains of the seaweed *Kappaphycus* and reduce 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. Finally the carrageenan quality of *Kappaphycus* produced from spores is not different.

##### *Adoption of economically viable systems to produce sufficient seedstock*

Several fish/shellfish production projects are being implemented 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. For

the abalone, a total of 31, 947 abalone juveniles (5mm-8mmSL) have been produced with an average survival rate (from veliger larvae) of 0.70.

*D. Capacity-building of fishfarmers and other industry stakeholders on appropriate breeding and larval rearing technologies*

On-site technical assistance on mudcrab seed production was provided to several private hatchery operators, namely the Mari-al Hatchery in Quezon, Aquatech Hatchery in Iloilo and the CDO Foodsphere Inc Hatchery in Zambales. Promotion of the hatchery and nursery technologies for mudcrab are also extended to State Universities and Colleges as well as the local government units by way of mudcrab hatchery, nursery and grow-out operations training and on-the-job or internship training courses. A pilot demonstration hatchery was also constructed in Guindulman, Bohol and the technical staff who will start operating this hatchery have already undergone training at SEAFDEC/AQD.

Several specialized training courses were offered to local government representatives, private sector investors and fisherfolk. These were on sandfish, abalone, tilapia and the giant freshwater prawn. Apart from these customized courses, on-the-job trainees were also accommodated in the AQD hatcheries during this period. Moreover, technical assistance was also provided to local international private sector clients through the Agree Build Operate and Transfer Aqua Negosyo Program. The details are to be included in the report of the Head of the Technology Verification and Demonstration Division.

#### **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2015**

##### **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 2015**

###### **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:**

- Stocks surveyed and domesticated, larval rearing and grow-out culture requirements established.
- Effective broodstock management schemes for giant freshwater prawn developed.
- Cost-effective and low pollution prawn broodstock diet developed; economic analysis done on the use of cowpea meal as alternative protein source in dietary formulation,

###### **MUDCRAB/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.
- Institutional Capacity Building for Sustainable Aquaculture for several local government technology recipients 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.

## **TRAINING DEPARTMENT**

### **1. Promotion on strengthening of SEAFDEC visibility and image**

In 2014, fishery information from activities implemented by TD was disseminated to public through three national exhibitions, where a total of more than 90,000 audiences visited TD's booths. Two issues of Advance Fisheries Technology (AFT) Magazine under the theme of "Aquaculture Technology" and "Fisheries Resource Survey", respectively, were published and disseminated to the network of TD through either hard or soft copies. The third issue of the year, under the theme on "Fisheries Processing Technology" is being prepared and will be published and disseminated by the end of the year. In the activities of management information system, the project collaborated with the Secretariat to develop database system to support monitoring and management of SEAFDEC programs. Two information staff also attended in relevant seminar to enhance their skills and experience to support the future information-related work.

### **2. Tailor-made Training Programs**

More than 90 participants attended in four tailor-made training courses and study tour programs organized by TD based on the need and requirement from partner agencies. These training and study tour programs were designed and planned by TD in consultation with respective partner agencies, to come up with appropriate subjects, duration, training location, etc. that suit with target participants, in order to build up human capacity on fisheries related subjects of interest.

### **3. Improvement of Fisheries Technology and Reduction of the Impact from Fishing**

Eight sub-activities from three main activities, *i.e.*: 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 level



## TRAINING DEPARTMENT

### 1. Overall Review

In 2014, TD implemented three projects under its Departmental Program. The project on *Promotion on Strengthening of SEAFDEC Visibility and Image* was implemented to strengthen and support the activities of TD and enhance SEAFDEC visibility to public. Imparting knowledge of fisheries information through SEAFDEC role to public is main output by conducted exhibition, AFT magazines. Moreover, The electronic files of AFT magazine and other information were produced and distributed to TD network by this channel. In 2015, the project is continued. Understanding on SEAFDEC and Departments role and activities, delivery of fisheries information to stakeholders and the public, tools and management information system of organization are expected output of this project implementation.

Under the project on *Tailor-made Training Program* ten tailor-made training courses and study tour programs were organized, based on the need and requirement from the partner agencies and some Member Countries to support human capacity building of their respective agencies. Activities on tailor-made training courses and study tour programs will be conducted, designed and planned out by the consultation and agreement of TD and respective partners. This includes the choice of subjects, duration, location, and the target participant. Courses/programs can be conducted by combining existing training programs or come up with completely new topics and programs. Costs from conducting these training and study tour programs would be charged based on the cost recovery principles.

Moreover, the project on *Improvement of Fisheries Technology and Reduction of the Impact from Fishing* was also implemented by TD. 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 is technology transfer and development through enhancement of strengthening on coordination and collaboration with other relevant agencies on the issues related to fishing technology, marine engineering, fisheries information and database. In 2015, seven sub-activities under main activities will be continued as follows: i) Sea trial on reducing the energy use in trawlers – low energy consumption trawl net (LEC-trawl), ii) Manual for fishing gear survey, iii) Advanced Sustainable Technology: Underwater camera system for observing trawl net, iv) FAO Energy Audit for Trawlers in the Gulf of Thailand, v) Research on bottom sediment around set net area in Ban Phae, Rayong Province, vi) Coastal Capability Enhance in Southeast Asia: Study on Bycatch in Bottom Gillnet Fisheries along the coast of Rayong Province, and vii) 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

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Promotion on strengthening of SEAFDEC visibility and image

**Responsible Department:** Training Department

**Total Duration:** 2015

**Funding Sources:** Training Department

**Estimated Budget for 2015:** 50,000 USD

### 1. INTRODUCTION

The Information Strategies for Enhancing SEAFDEC Visibility and Communication 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 emphasized on raising SEAFDEC image at international, regional, national levels and enhancing communication and information sharing both within SEAFDEC and with Member and non-Member Countries, other international/regional organizations, and the public.

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: Adaptation to a Changing Environment” in Bangkok, Thailand during 13-17 June 2011 also emphasized 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, TD therefore proposes to implement the project of “Promotion on strengthening of SEAFDEC visibility and image” as its Departmental Program to promote the roles and activities of SEAFDEC, and enhance the visibility and image to Member Countries, other international institutions and the public.

### 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 roles and SEAFDEC Departments activities;
- Delivery of fisheries information to stakeholders and the public;
- Tools and database of TD information system; and
- Hub of fishery information in the region

#### 2.3 Project Description/Framework

**Activity 1:** Promotion and Enhancement of SEAFDEC Visibility and Image

SEAFDEC roles and results from TD’s activities undertaken in collaboration with other SEAFDEC Departments such as knowledge on fisheries information will be promoted and enhanced among others international institutions and the public through national and international exhibitions as required and other suitable channels.

### Activity 2: Production of Information Materials

Hard and soft copies of publications such as Advance Fisheries Technology (AFT) magazine, electronic multimedia, fisheries information packages on fisheries information/knowledge and the implementation of activities by TD will be produced. These information materials will be delivered to the public to enhance SEAFDEC visibility and image.

### 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 and *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 2014

Project Activity Title	Duration	Remarks
Activity 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 Navy was organized. More than 6,000 audience visited TD booth.	11 Jan 14	
- Exhibition on Coastal Resource Enhancement in Marine Science Seminar, Songkhla Province, Thailand. More than 320 audience visited TD booth.	10-12 June 24	
- Exhibition at the annual national fair "Pramong Nomklao" was organized in collaboration with the Thai Department of Fisheries. TD presented fisheries activities such as crab bank under the theme of "Coastal resource enhancement and rehabilitation for food security". With the distribution of various technical publications, brochures, VCDs and fishery-related souvenirs to the audience, the SEAFDEC visibility was promoted. More than 84,000 audience visited TD booth.	27 Jun- 6 Jul 14	
Activity 2: Production of Information Materials - Three issue of Advance Fisheries Technology in theme of "Aquaculture Technology" and "Fisheries Resource Survey" were produced and distributed about 4,000 copies to TD networks and the public by mail and e-mail to enhance fisheries knowledge and public relation of TD and implementation activities. Moreover, last issue of this year in theme of "Fisheries Processing Technology" will be produced and distributed in December 2014	Apr and Aug 14	
- Three electronic books as Story of Fisherman, A Story of a Boy Named POR and A Story of TANU was produced and uploaded on TD website and 50 CD-Rom.	Mar 14	
- Production of VCD on introduction of SEAFDEC role and activities in Indonesia language.	Jan 14	
Activity 3: Management Information System - TD collaboration with Secretariat is developing database system for managing overall SEAFDEC Programs. The information collected including detail of training course such as list of training courses, list of participants and download of training documents	Jun-Dec 14	
Activity 4: Human capacity building for SEAFDEC information staff - Information staff attended the seminar on challenge of library in the future. To development information management skill on e-book production and so on.	Jan 14	

Project Activity Title	Duration	Remarks
- TD webmaster participated in the QAR Conference 2014 “Connecting Knowledge Library, New Media and Technology”, aim to share ideas and learn about innovations in library development for strengthening the access to information technology	29-30 May 14	

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2015

##### 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) - Three electronic books (E-book) on promotion of resources conservation and safety at sea will be developed and produced in the form of CD-Rom - Fisheries information package to promote awareness understanding on “Responsible Fisheries” will be produced. The package will include books, brochures, CD-ROM and etc. that are relevant to responsible fisheries issues. - Introduction of SEAFDEC role and activities VCD by Member Countries language.	Jan-Dec	
Activity 3: Management Information System - The development database system for managing overall SEAFDEC Programs will be continued and trail in collaborative with all Department.	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 and etc.	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:** 2015  
**Funding Sources:** Training Department  
**Estimated Budget for 2015:**

### 1. INTRODUCTION/BACKGROUND

In each year TD has conducted several regional training courses, that are a channel to transfer activities outcomes and technology developed by SEAFDEC to its Member Countries, therefore the participants will come home with knowledge about “how they learn and how they do in SEAFDEC/TD, Thailand”. However continuously, in every year SEAFDEC/TD has been 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 giving support to the interested of SEAFDEC Member Countries and other agencies in strengthening the capability of their respective staff on fisheries-related subjects. The course would be planned and conduct to meet the specific need of different groups of participants.

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; and
- 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 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 2014

#### 3.1 Activities Achievements in the Year 2014

Achievements based on Activities	Duration	Remarks
1. A study visit program on Sustainable Coastal Community and Ecosystem Service The program was conducted under collaboration with AIT. There were 12 participants from Sri-Lanka attended in the program.	1 day 27 May 2014	
2. Tailor-made Program on fishing boat navigation and maintenance There were 30 DOF-Thailand officers participated in this training course; the course was composed of two main parts: 1. Fishing boat navigation and 2. Fishing boat and engine maintenance.	7 days (19-25 August 2014)	
3. Short-term Training Course for University Students on Ecosystem Approach to Fisheries Management" (Batch-57) The training course was conducted at SEAFDEC/TD, there were 40 students from seven difference Universities attended in the training course.	11 days (3-13 June 2014)	
4. Long-term Training Course on Fishing Operation for Tinsulanonda Fisheries College This training course is conducted under the collaboration between TD and the Office of Vocational Education Commission. The training is a part to support the country in producing seamen and navigators for fisheries industrials of Thailand. There were 10 students attending on this training course for this batch.	4 months, from 7 Oct 2014 to 20 Feb. 2015.	

### 4. PROPOSED ACTIVITIES FOR THE YEAR 2015

At least three tailor-made training programs will be conducted in the year 2015. The course titles, programs and activities will be designed base on the requirements/needs from the training partners.

#### 4.1 Expected Outcomes/Outputs of the Year 2015

TD will continuously be a part to support Member Countries or other organizations/institutes to build up human capacity on the fisheries related issues especially base on the need and requirement aspects of the training partners/donors.

## PROJECT DOCUMENT

**Program Categories:** Departmental Programs

**Project Title:** Improving of Fisheries Technology and Reduction of the Impact from Fishing

**Responsible Department:** Training Department

**Total Duration:** 2014~

**Funding Sources:** Department of Fisheries Thailand, etc.

**Estimated Budget for 2015:** 55,000 USD

### 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 – RINH, SmartCatch), including technical assistant, research and development, sea trial, and demonstration.

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 in Rayong Province
  - 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
  - a. Research on bottom sediment around set net area in Ban Phae, Rayong Province
  - b. Coastal Capability Enhance 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

- To transfer appropriate technologies and practices to support sustainable utilization of coastal and marine fisheries resources including capture fisheries, marine engineering, and fishery information system; and
- To strengthen collaboration with relevant agencies at national, regional, and international levels.

#### 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

### *Sea trial on reducing of energy use in trawlers – low energy consumption trawl net (LEC-trawl)*

The first sea trial was made in August 2013 to test the modified trawl net for lower fuel consumption. The LEC-trawl net was designed to have only 2/3 of its original weight. Preliminary finding was that RPM of the engine could be reduced due the reduction of the dragging force of the net. However, the catch efficiency of the LEC-trawl will be evaluated with a more sea trials that are scheduled in late 2013 and 2014. Sea trials were completely conducted in 2014. Result of the sea trials will be published in 2015.

### *Manual for fishing gear survey*

The manual will be published in 2015. Targeted users include fishing gear technologists in the Member Countries and other technologists in the university and institutions.

### *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. The following data parameters will be collected and published:

- By-catch observation
- Productivity: time in water for optimal harvest yields
- Quality of catch: target species vs non-target species capture
- System performance: how well the CatchCam system perform in the various field tests

### *FAO Energy Audit for trawlers in the Gulf of Thailand*

A new phase of energy audit will be implemented with the budget from FAO HQ. Activities include 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. It is envisaged that activities of this program will be completely implemented by the first quarter of 2015.

### *Research on bottom sediment around set net area in Ban Phae, Rayong Province*

This program has been jointly implemented by SEAFDEC, EMDEC (Eastern Marine Research and Development Center, stationed in Rayong Province), RINH (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 in Ban Phae. The samples collected from the set net area will be compared with the sediments in surrounding areas. Data will be collected regularly throughout the year 2015. This program will be end by the year 2016.

### *Coastal Capability Enhance in Southeast Asia: Study on Bycatch in Bottom Gillnet Fisheries along the Coast of Rayong Province, Thailand*

The objective of this study is to collect data on bycatch composition and estimate the total bycatch in small-scale gillnet fisheries operating in the coastal area of Rayong Province. Qualitative research by Rapid Rural Appraisal (RRA) comprising three methods (primary data collection, review of the secondary data, and direct observation) will be applied for the survey data to estimate quantity of bycatch in bottom gillnet fisheries. Survey period will be between January and December 2015. Data analysis is planned from January to May 2016.

### *Development of database system for management of data from the cruise surveys*

With the aim to harmonize data collection for the research cruise survey on fisheries resources between Deep-sea Fishery Technology Research and Development Institute (DFTRD) of Thai Department of Fisheries and 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). The manual on the database operation developed by this program has been used for both parties for data input, analysis and reporting. It can be observed that all data collected from the cruise surveys is now systematically stored, managed and shared. TD also assisted DFTRD to develop a national database for data collection from the cruise survey of their national research vessels for future data compilation.

### 3. PROGRESS/ACHIEVEMENTS OF ACTIVITIES IN THE YEAR 2014

Project/Activity Title	Duration	Remarks
Sea trial on reducing the energy use in trawlers – low energy consumption trawl net (LEC-trawl)	Jan to Dec	Field tests were completely carried out during the first half of the year 2014. Data is being analyzed. Report of the findings will be published in 2015.
Manual for fishing gear survey	Jan to Dec	Final draft of the manual was completed.
Research on bottom sediment around set net area in Ban Phae, Rayong Province	Jan to Dec	Data will be collected by SEAFDEC and other partners. Results will be jointly reported.
Development of database system for management of data from the cruise surveys	Jan to Dec	The system developed since 2013 have been maintained for new data input.

### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2015

#### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Sea trial on reducing the energy use in trawlers – low energy consumption trawl net (LEC-trawl)	Jan to July	Data will be analyzed during the first half of 2015. Report of the findings will be published in 2015.
Manual for fishing gear survey	June	Publication will be disseminated to the target users.
Advanced Sustainable Technology: Underwater camera system for observing trawl net	Jan to June	The following three (3) phases will be implemented as follow: Phase 1: Pre-production, 4 weeks Phase 2: Production test, 2 to 3 weeks Phase 3: Production deployment, 6 weeks
FAO Energy Audit for Trawlers in the Gulf of Thailand	Jan to Mar	6 trawlers will be used for energy audit. The standard system for auditing the fuel amount used during the fishing trip will be recorded and analyzed.
Research on bottom sediment around set net area in Ban Phae, Rayong Province	Jan to Dec	Data collection will be continued. Results will be jointly reported.
Coastal Capability Enhance in Southeast Asia: Study on Bycatch in Bottom Gillnet Fisheries along the coast of Rayong Province	Jan to Dec	Primary data collection using in-depth interview, direct and actual observation without participation, and review of secondary data will be carried out.
Development of database system for management of data from the cruise surveys	Jan to Dec	The system developed since 2013 will be maintained. Some minor development or adjustment of the system will be made through consultation with the Department of Fisheries of Thailand.

#### **4.2 Expected Outcomes/Outputs**

1. Report of the sea trial on reducing the energy use in trawlers – low energy consumption trawl net (LEC-trawl);
2. Manual for fishing gear survey;
3. Study report on the advanced sustainable technology: underwater camera system for observing trawl net;
4. Report of FAO energy audit for trawlers in the Gulf of Thailand; and
5. Mid-term report on the coastal capability enhance in Southeast Asia: study on bycatch in bottom gillnet fisheries along the coast of Rayong Province
6. Operation manual of database system for management of data fro cruise survey



**OTHER PROGRAM**

<b>Other Programs: Project Title</b>	<b>Lead Department</b>	<b>2014</b>	<b>2015</b>	<b>Appendix No.</b>
Coastal Area Capability Enhancements in Southeast Asia (SEAFDEC/RIHN Collaborative Project)	TD	Y	Y	1

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

Project id: 01201210			
<b>Program Categories:</b>	Other Programs		
<b>Project Title:</b>	Coastal Area Capability Enhancements in Southeast Asia (SEAFDEC/RIHN Collaborative Project)		
<b>Program Thrust:</b>	-	<b>Total Duration<sup>1</sup>:</b>	5 years (April 2012-March 2017)
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	Thailand (C1-C6)/Philippines (C:7)
<b>Donor/Sponsor:</b>	RIHN (Research Institute for Humanity and Nature, Japan)	<b>Total Donor Budget:</b>	USD 387,200
<b>Project Partner:</b>	(Japanese Institutes, Fac. of Fisheries-Kasetsart Univ., EMDEC-DOF-Thailand)	<b>Budget for 2015:</b>	USD 80,300 (Proposed)
<b>Project leader:</b>	(Taweekiet A./Project Coordinator)		

## PART I: OVERALL PROJECT DESCRIPTION

### 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

<sup>1</sup> 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.

## 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 and Performance Indicators

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; and
- 8) Establishment of "Area Capability Approach" and its guidelines, through the human networks among SEAFDEC Member Countries

## 2.3 Outputs Indicators and Activities

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1: Inventory database and reference books on coastal fishery in Southeast Asia	Participating members had better understanding on the coastal fishery in Southeast Asia, especially on small-scale fishing gear around the experimental set-net project	Component 1	-Inventory database and reference books -Updated information on present situation of coastal fishery in Southeast Asia
Outcome 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	Updated database and taxonomic coastal resources (focusing on fishes) in Southeast Asia and population structure map of major marine fisheries target species	Component 2	-Inventory database and field guide books -Updated information on marine fish species and its population structure in Southeast Asia
Outcome 3: Research protocol guidelines and reference books on ecosystem health for coastal area	Agreed and created standard research protocol guidelines and reference books on ecosystem health for coastal area	Component 3	Establishment and application of research protocol guidelines and reference books on ecosystem health for coastal area
Outcome 4: Research protocol guideline and reference books on social aspects for coastal area	Agreed and created standard research protocol guideline and reference books on social aspects for coastal area	Component 4	Establishment and application of research protocol and guidelines and reference books on social aspects for coastal area
Outcome 5: Acoustic survey methodology and analysis system for coastal area	Set-up standard Acoustic survey methodology and analysis system for coastal area	Component 5	Establishment and application of acoustic survey methodologies and analysis system for coastal area (shallow waters)
Outcome 6: Guideline of community based Set-net fishery installation and utilization for coastal management	Set-up guideline of community based Set-net fishery installation and utilization for coastal management	Component 6	Establishment and application of community based Set-net fishery installation and utilization for coastal management, as a pilot project
Outcome 7: Guideline of community based restocking activities for co-managements of coastal resources	Set-up guideline of community based restocking activities for co-managements of coastal resources	Component 7	Establishment and application of guideline of community based restocking activities for co-managements of coastal resources

Outcome 8: Establishment of “Area Capability Approach” and its guidelines, through the human networks among SEAFDEC Member Countries	Increased awareness, strengthened regional cooperation, network on through “Area Capability Approach” and its guidelines among SEAFDEC Member Countries	Combinations of Component 1-7	Establishment and application of the “Area Capability Approach” concept and its guidelines
---	---	-------------------------------	--

## 2.4 Overall Scope/Description of Project

Table 2: Overall project description for activity

Activity	Description
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.



	<p>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.</p>
	<p>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.</p>
<p>Component 4: Human capability survey for Coastal Area</p>	<p>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.</p>
	<p>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 surveys. 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.</p>
	<p>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.</p>
<p>Component 5: Development of acoustic survey equipments and systems for shallow waters</p>	<p>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.</p>
	<p>Activity 2: Field test of the developed equipments and system Newly developed equipments and systems will be tested at field.</p>
	<p>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.</p>
	<p>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.</p>
<p>Component 6: Community-based Set-net introduction for coastal management and HRD</p>	<p>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.</p>
	<p>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 analysed to clarify the linkage among set-net installation and livelihood changes.</p>

	<p>Activity 3: Publication of the Set-net installation manual and management guide book Set-net installation manual and management guide books will be published.</p>
<p>Component 7: Community-based fishery resource rehabilitation for coastal management and rural development (Based and implemented in the Philippines*)</p>	<p>Activity 1: Technical support of the hatchery works Technical supports to establish and to manage local hatchery activities will be conducted from experts.</p>
	<p>Activity 2: Conduct stock enhancement works with local institutions Release works of larvae and/or fly of important species in Batan Bay in the Phillipines</p>
	<p>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</p>
	<p>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.</p>
<p>Component 8: Database construction, Workshops and Wrap-up Activities</p>	<p>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.</p>
	<p>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.</p>
	<p>Activity 3: International Symposium of Area Capability Approach International symposium for Area Capability Approach for coastal development will be held.</p>
	<p>Activity 4: Area Capability Guidebook Publication Area Capability Approach guide book will be published based on the collaborative research results.</p>

## 2.5 Activity, Sub-activity and Proposed Budget for 2012-2017

Table 3 Proposed Budget based on activity and sub-activity for 2012-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2012	Y2 2013	Y3 2014	Y4 2015	Y5 2016
Component 1	Fishing Capability survey	3,000	3,000	3,000	3,000	3,000
Component 2	Biological Survey	2,000	3,000	3,000	3,000	3,000
Component 3	Environmental Survey	2,000	3,000	3,000	3,000	3,000
Component 4	Social and Livelihoods Survey	12,000	12,000	12,000	12,000	12,000
Component 5	Acoustic Survey	3,000	4,000	4,000	4,000	4,000
Component 6	Set-net Impact Evaluation	10,000	10,000	10,000	10,000	10,000
Component 7	Re-stocking Impact Evaluation	25,000	35,000	35,000	35,000	35,000
Component 8	Workshop and Meeting	3,000	3,000	3,000	3,000	3,000
	Overhead charges	6,000	7,300	7,300	7,300	7,300
<b>Sub total</b>		<b>66,000</b>	<b>80,300</b>	<b>80,300</b>	<b>80,300</b>	<b>80,300</b>

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 3. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs <sup>2</sup>	Type of Activity	Proposed Budget
Component 1: Fishing Capability survey	April 2015- March 2016	Survey data/Database/ References/ Financial	Data analysis/ Compilation and Publication	3,000
Component 2: Biological Survey	April 2015- March 2016	Survey data/Database/ References/ Financial	Field survey and Data analysis/ Compilation and Publication	3,000
Component 3: Environmental Survey	April 2015- March 2016	Survey data/Database/ References/ Financial	Field survey and Data analysis/ Compilation and Publication	3,000
Component 4: Social and Livelihoods Survey	April 2015- March 2016	Survey data/Database/ References/ Financial	Field survey and Data analysis/ Compilation and Publication	12,000
Component 5: Acoustic Survey	April 2015- March 2016	Survey data/Database/ References/ Financial	Compilation and Publication	4,000
Component 6: Set-net Impact Evaluation	April 2015- March 2016	Survey data/Database/ References/ Financial	Compilation and Publication	10,000
Component 7: Re-stocking Impact Evaluation	April 2015- March 2016	Survey data/Database/ References/ Financial	Compilation and Publication	35,000
Component 8: Workshop and Meeting	April 2015- March 2016	Survey data/Database/ References/ Financial/ Researchers/ Participants	Database Development/ Meeting, Workshop, Seminar, Study tour/ Compilation and Publication	3,000

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 4. Achievements of the Project Implementation for the Year 2014

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 3 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.

<sup>2</sup> The financial, human, material, technological and information resources used for development interventions

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, 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 and second year of the project implementation.

Summary of all activities and findings would be reported in the 3<sup>rd</sup> RIHN Project Seminar held in October 2014, in the Philippines.

#### 4.1 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 (USD)
		MCs	SEAFDEC	Others	
Component 1: Fishing Capability survey	R		2	3	806.3
Component 2: Biological Survey	R		1	2	
Component 3: Environmental Survey	R		1	2	946.55
Component 4: Social and Livelihoods Survey	R		4	3	1,888.78
Component 5: Acoustic Survey	R, T		3	4	873.12
Component 6: Set-net Impact Evaluation	R		4	1	1,185.59
Component 7: Re-stocking Impact Evaluation	-	-	-	-	-
Component 8: Workshop and Meeting	-	-	-	-	73.90
Overhead charges					7,300

#### 4.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
Output 1: Awareness of present situation of fishing activities along Mae Ram Pueng Beach, Rayong Province (coastal fishery)	Participating members have better understanding on the present situation of fishing activities along the coast line of Rayong Prov.	<ul style="list-style-type: none"> <li>- A series of field survey on fishing operation/catch results through fishing log books, interviews along the coastline of Mae Ram Pueng Beach and adjacent areas</li> <li>- Observation of fishing activities in the adjacent area of set-net</li> <li>- Discussion on the inventory of fishing gear and operation</li> </ul>	
	Major problems issues of the fishery along the coast line of Rayong Prov. are well recognized by the members		
Output 2: Awareness of fisheries resources near the Set-net Project	Participating members are aware of the present situation of existing	A series of field surveys on biological data collection in the set-net area	

	fisheries resources near the Set-net Project		
Output 3: Awareness of marine environment near the Set-net Project	Participating members are aware of the present situation of marine environment near the Set-net Project		
	Major problems/issues of the fishery and concerned pollution ( <i>e.g.</i> oil spill) along the coast line of Rayong Prov are well recognized by the members and the fisher groups	- A series of field surveys on marine environment in the set-net area	
Output 4: Awareness of social aspects of the fishermen near the Set-net Project and adjacent areas	Participating members have better understanding on the social aspects of the fishermen near the Set-net Project and adjacent areas	- A series of field survey for data and information collection on social economic aspects in Rayong and Trat provinces	
Output 5: Understanding the survey methodology and marine resources condition for coastal area	Participating members under the holistic situation of biomass in the set-net area through the acoustic survey method	<ul style="list-style-type: none"> <li>- Hydro-acoustic equipments and system development in the shallow waters</li> <li>- A series of field tests, trials for the equipments in the set-net and adjacent areas</li> <li>- Data collection</li> <li>- On-site training provided for graduate students (Kasetsart University)</li> <li>- Launched publications of research protocol guideline of acoustic survey for coastal area through international and national levels conference on hydro-acoustic survey for marine resource assessment in shallow waters</li> </ul>	
Output 6: Understanding the present status and merits of Rayong Set-net Project and environmental conditions that influence the performance of the gear	Participating members have better understanding on merits of set-net and its roles in resource enhancement and as a tool for community-based management	<ul style="list-style-type: none"> <li>- Periodical data collection on environmental factors (water current, depth and wind conditions) and</li> <li>- Catch survey and monitoring on set-net operation</li> <li>- Preliminary analysis and results presentation on water current conditions/wind conditions/gear performance (depth) and trophic levels through the collected sample tissues of the fish from set-net</li> </ul>	

Table 7 List of completed publications and others

<b>List of completed publications for the year 2014</b>	<b>Type of media</b>
1. Trend analysis of slope net depth, according to flow condition in Rayong Set-Net ( <i>in English, Thai and Japanese</i> ), Component 6	Poster
2. Stable isotope analysis of set-net catch in Rayong, Thailand ( <i>in English</i> ), Component 6	Poster
3. Interval Video Monitoring on Fishing Activities of Small-scale Gears around Set-net in Rayong, Thailand ( <i>in Japanese</i> ), Component 6	Poster
4. The Seventh Annual Meeting of Fisheries Acoustics Society, AFAS2013, Tokyo, November 5-6, 2013 Development of the simple system for measurement of fish distribution in shallow water using GPS fish-finder,	Abstract

5. The 4 <sup>th</sup> Marine Science Conference “Blue Ocean Science”, Prince of Songkla University at Songkla Province, Thailand, June 10-12, 2014	Poster
---	--------

#### 4.3 Project Outcomes and Lesson Learned

Outline any emerging outcomes or lessons, if any that have been learned during the project period that could be passed on to other projects.

#### 4.4 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.

- Seasonal changes can affect the survey plan especially for field surveys or fishing activities and resulting in interruption of data collection or missing data in monsoon season
- As the Rayong set-net project is now an experimental fishing gear and under supervision of EMDEC-Dept. of Fisheries. To operate this fishing gear legally by the set-net fisher group, a public hearing process and official declaration made by the Rayong provincial level must be made. While the process is going on, the operation of this fishing gear is now being suspended. As the Rayong set-net is the core of this project. This may interrupt or delay the progress of over-all project activities that have direct concern with set-net if it does not exist.

### PART IV: EVALUATION

#### 5. Project Evaluation

Provide brief details of progress in terms of the development and implementation of the project evaluation plan. Provide details of any interesting findings or emerging evaluation issues of interest.

Table 8 Project Evaluation (for annual, mid-term, and end of project), as of 2014

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	Mostly inputs and activities could respond the questions and provided better understanding the present status of the conditions of the fisheries along the Mae Ram Pueng Beach, Rayong province.	50
<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>	Obtained survey data (field survey, log books) have contributed to better understanding of present status and existing fishing activities in the set-net area. This would facilitate in preparation of standardization of all survey aspects in the coastal area of Rayong province	40
<i>Which has benefited on society and sector?</i>	Component 4: Human capability survey for coastal Area can greatly provided more understanding on livelihood of fishermen and can contribute to preparation on guideline of community based set-net and for co-management of coastal resources	30
<i>Have products and benefits been maintained?</i>	Yes.	50



## STATEMENT

*By Dr. Simon Funge-Smith  
Food and Agriculture Organization of the United Nations,  
Regional Office for Asia and the Pacific (FAO/RAP)*

Dr. Chumnarn Pongsri, Secretary-General, SEAFDEC  
Distinguished Member Country Delegates to the SEAFDEC Programme Committees  
SEAFDEC colleagues and observers from regional organizations and arrangements

On behalf of Hiroyuki Konuma, Assistant Director General and Regional Representative of the Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific, I would like to thank SEAFDEC for providing the opportunity to provide a statement regarding the cooperation and coordination of the programmes of work of FAO and SEAFDEC

The review of the SEAFDEC programmes provided to the Programme Committee, clearly indicates the extent to which SEAFDEC and FAO have been achieving regional cooperation in delivering support to our mutual Member Countries.

Under the FCG/ASSP mechanisms, the HRD programme on fisheries management approach for sustainable fisheries, links strongly to the essential Ecosystem approach for fishery Management, which was developed by BOBLME/NOAA/APFIC and partners as a regional training course and which SEAFDEC training department has joined, and now embarked on a process for becoming effective regional trainers.

Noting the project need for increased aquaculture production in the coming years as one of the strategies for sustaining affordable fish supplies in the ASEAN region, the promotion of sustainable aquaculture lies at the heart of the FAO regional initiative on blue growth which seeks to promote opportunities and strategies for sustainable intensification of aquaculture. FAO is looking for further regional partnership in implementing a strategy to do this, and it is highly likely that this will be a major growth area in the near future, as we are already seeing considerable public and private sector interest in aquaculture development in the region.

At the project level, FAO continues to appreciate the cooperation with SEAFDEC in the joint execution of the Strategies for Trawl fisheries Bycatch Management (REBYC II), this programme has been a first step between FAO and SEAFDEC to directly cooperate on executing GEF funded regional projects and it seems that there is plenty of scope for further cooperation in this area.

I would also like to appreciate the cooperation of SEAFDEC Secretariat and the SEAFDEC Centres with the Bay of Bengal Large Marine ecosystem Programme, particularly in the area of the development of the regional training course on EAFM.

The forthcoming cooperation of SEAFDEC on combating IUU fishing and improving catch certification is another area where close collaboration with FAO would be appreciated. APFIC and FAO will undertake regional and global estimations of the extent of IUU fishing in the region and worldwide over the coming years and it is important that these are informed by regional knowledge and understanding of the issues.

FAO would like to congratulate Indonesia and SEAFDEC on the newly opened SEAFDEC Inland Fisheries Resource Development and Management Department in Palembang, South Sumatera, Indonesia, and hope that this will strengthen efforts to manage inland fisheries, which are of such massive importance in the ASEAN region.

I would like to take the personal opportunity to congratulate Singapore and Brunei Darussalam in joining the membership of FAO, as we now have common memberships



In closing and as Secretary of APFIC, I would like to take the opportunity to invite SEAFDEC to participate in the forthcoming APFIC/FAO *regional consultative workshop on improving the contribution of culture-based fisheries & related fishery enhancements in inland waters to blue growth*". The venue and date of the workshop has now been established and is 24–27 May 2015 in Colombo, and the APFIC/FAO regional consultative workshop on "*Documentation and dissemination of successful sustainable aquaculture intensification practices in Asia*" to be convened in June 2015.

Finally, I would like to thank our hosts, the Department of Fisheries Thailand, for their excellent arrangement in hosting this event and the consideration extended to FAO in this regard.

Thank you.

## STATEMENT

By Dr. Cherdsak Virapat  
*Network of Aquaculture Centres in Asia-Pacific (NACA)*

The Chairperson,  
Distinguished Delegates at the 37<sup>th</sup> Meeting of the SEAFDEC Programme Committee,  
Ladies and Gentlemen,  
Greetings 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 37<sup>th</sup> Meeting of the SEAFDEC Programme Committee.

I wish to take this opportunity to congratulate SEAFDEC for significant advancement on its works in promoting sustainable fisheries for rural development and poverty eradication and sustainable management of fisheries in Southeast Asia especially during the last five years.

In particular, the Plan of Action on Aquaculture and related issues adopted by the ASEAN-SEAFDEC Senior Officials during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 “Fish for the People 2020: Adaptation to a Changing Environment” held in June 2011 in Bangkok, Thailand has been a useful guideline for formulating and implementing programmes, projects and activities through appropriate ASEAN-SEAFDEC mechanisms as well as policy review within the region.

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.

NACA's development objectives are to promote rural development through sustainable aquaculture and aquatic resources management. NACA seeks to improve the livelihoods of rural people, reduce poverty and increase food security. The ultimate beneficiaries are farmers and rural communities. NACA implements its mission through a network of 19 member governments and affiliated regional and national centres in the Asia-Pacific region, in partnership with international donors and development agencies. NACA's work is based on five thematic programmes, namely; aquatic animal health; sustainable farming systems; genetics and biodiversity; food safety, quality and certification; and response to climate change. There are also three cross-cutting programmes on education & training; gender; and information and communications.

NACA's strategic vision on aquaculture development in the next five years and beyond will be focused on the following areas and activities, namely;

### 1. Adaptive Management for Small-scale Rural Aquaculture Development for Poverty Reduction

NACA will cooperate and collaborate with FAO and its member governments to plan and implement national and regional strategies and action plans on *sustainable intensification of aquaculture, culture-based fisheries; and women, youth and aquaculture development projects.*

### 2. Emergency Rapid Appraisal of Amplification of Shrimp Disease by Inbreeding

NACA will collaborate with Thailand's Department of Fisheries to implement an Emergency Rapid Appraisal of Amplification of Shrimp Disease by inbreeding, focussing on Early Mortality Syndrome (AHPND). This will provide strategic platform to assist other NACA member governments to address this issue in shrimp and possibly other species;

### 3. Improve information and communication between NACA and Its member government agencies

NACA will develop its regional web-based information and GIS systems to facilitate effective communication and information sharing within the network. NACA will also collaborate with its member governments and associated partners on building of the information-base for aquaculture policy-making, planning and management;

### 4. Capacity Building Programmes in Aquaculture Governance

NACA will develop syllabus of its capacity building programme in Aquaculture Governance for the Asia-Pacific Region and will collaborate with its partners to implement such a training programme starting in 2016;

### 5. Mitigation and Adaptation on Impacts of Climate Change on Aquaculture and Fisheries

NACA will collaborate with FAO and its partners to coordinate and to implement a regional technical cooperation programme on “Facilitate the development of an environmental monitoring system to strengthen fisheries and aquaculture resilience and to improve early warning in the Lower Mekong Delta” from November 2014-May 2015;

### 6. Strengthening Cooperation and Coordination among Member Government Agencies, NACA Partners, and Public-private Partnership

NACA will seek collaboration in development projects, organisation of forums, workshops, meetings, and various technical training courses.

I hope that NACA and SEAFDEC will find opportunities to strengthen their collaboration and coordination on these strategic foresights in aquaculture development in the near future. Thank you.

## STATEMENT

*By Representative from the National Agriculture Training Council (NATC) of  
the Ministry of Agriculture and Agro-Based Industry Malaysia*

Mr. Chairperson and Ladies and Gentlemen,

On the behalf of National Agriculture Training Council (NATC) of the Ministry of Agriculture and Agro-Based Industry Malaysia, I would like to express my sincere appreciation to your kind self and Seafdec for inviting NATC for the 3rd consecutive year to attend as an observer in this paramount forum dealing specifically on matters related to fisheries in Southeast Asia. However due to unforeseen reason we could not attend this meeting although all relevant arrangement had been made. Our sincere apologies.

2014 has been an exciting year for NATC. Our Agricultural College in the Northern state of Kedah is fully operational with an intake of 800 students. We have entered into a technical and training collaboration with The Royal Agricultural University at Cirencester UK, which is the oldest agricultural university in the Commonwealth. And most of all we have rebranded the School of Fisheries into College of Fisheries Malaysia, which will be the sole institution in Malaysia to provide full time skilled based fisheries training from July 2015.

Mr. Chairperson, we are also pleased to inform you that The Hon Secretary General of MOA Malaysia has approved the appointment of Seafdec -TD as one of the technical adviser for the Technical Committee of the College of Fisheries Malaysia to assist NATC in the proper and effective operation and capacity building of the college. We will submit the appointment letter the soonest. However NATC also humbly request other Departments of Seafdec, countries and international organisations or agencies to assist us in providing advance trainings, technical aides and transfer of skill based knowledge in the field of fisheries. One can not deny that Malaysia is indeed urgently in need of experts and skilled personnels to teach Capture Fisheries Technology and Marine Engineering in relation to fishing vessels.

For the year 2014, two planed tailor made training program by Seafdec did not materialise due unforeseen reason on our part although the budget has been approved by the Malaysian central agencies. However we hope training program for the anchovy fishers from Pangkor (who are mentors for our students) in Thailand will proceed as planned this year.

Mr. Chairperson, as final note we extend our sincere gratitude to Seafdec for assisting NATC in many aspects since 2008 and continue to do so in the coming years which we strongly believe will be more challenging.

Thank you,

Ganesan Vethiah,  
For The Director of NATC



## STATEMENT

By Dr. Malasri Khumsri  
Mekong River Commission Fisheries Programme (MRC-FP)

The Chairperson,  
Distinguished Delegates at the 37<sup>th</sup> Meeting of the SEAFDEC Programme Committee,  
Ladies and Gentlemen,

The MRC-Fisheries Program is implementing its (FP) Implementation Plan (PIP) 2011-2015 with the objectives is *Successful implementation of measures for sustainable fisheries management and development and improved livelihoods by regional and national organizations*". The FP-PIP has four outcomes: decision maker have a science based understanding of fisheries (outcome 1), generation of monitoring information and filling of information gaps (outcome 2), regional dialogue on coordinated knowledge uptake and implementation on national level (outcome 3), and capacity-development (outcome 4).

The MRC-FP maintains close contact and cooperates with our partners including SEAFDEC, NACA, FAO, WWF and other relevant organizations in order to support sustainable development and management of inland fisheries in the Lower Mekong Basin (LMB) and Southeast Asia as a whole.

The MRC-FP will continue cooperates closely with SEAFDEC in sharing and exchange of information to jointly support the Riparian Member Countries in sustainable development and management of inland fisheries in the Lower Mekong Basin. There is considerable three priorities working area for future cooperation included, but are not limited to, the following working areas:

- 1) Project implementation on Transboundary Fisheries Management:
  - a) Transboundary Fisheries Management in the Bordering Provinces in Southern of Lao PDR Katie, Cambodia and Lao PDR
    - Initial discussion between SEAFDEC and MRC-FP on collaboration was done and FP attended the 1<sup>st</sup> Meeting of the Technical Working Group for Fisheries Management in Trans-boundary Aras between Cambodia and Lao PDR, to finalize MOA between Cambodia and Lao PDR including the implementation plan of such collaborative activities as well as national activities to be carried out by each country.
    - Currently, MRC-FP is also in discussion with M-IWRMP of MRC to explore the needs and opportunities of FP supporting the WB funded transboundary project between Cambodia and Lao PDR
  - b) Transboundary Fisheries Management in the Bordering Provinces in Bokeo, Lao PDR and Chiang Rai, Thailand
    - FP invited SEAFDEC to attended the 2<sup>nd</sup> Joint Working Group meeting for this transboundary fisheries management implementation project
- 2) Exchange of experiences, lessons learnt and knowledge on fisheries and aquacultures and related topics through conferences, workshop, and meeting etc.
  - a) MRC has close co-organized with SEAFDEC and FP has contributed to the Experts Meeting on Mekong Cooperation on Fisheries, Aquatic Resources and Wetland: 20 years lesson learnt, organized on 12-14 November 2014 in Phnom Penh, Cambodia. A numbers of presentations on different lessons learnt regarding the assessment of capture fisheries, mitigation impacts of water development projects on fisheries, climate change and fisheries co-management were presented by MRC-FP. In additional, the MCR-FP also encouraged the riparian countries to present the experiences and lessons learnt from the national project implementation that supported by MRC-FP to this meeting.
  - b) The future cooperation in sharing and exchange of information will continue such as the 11<sup>th</sup> Fisheries Technical Symposium, will be organized in Thailand in May 2015, date and specific venue to be confirmed, Regional workshop on "Regional Workshop on Lessons

Learnt from project implementation on transboundary fisheries management” is planned to organize by the mid-2015 and the 16<sup>th</sup> NGF annual meeting

- 3) Support the Network for Promotion of Gender in Fisheries Management and Development in the Lower Mekong Basin (NGF)
  - a) Strengthening the NGF in promotion of gender in fisheries development and Management was initially discussed (Regional NGF Coordinator, FP, SEAFDEC and Sweden ) during the Experts Meeting on Mekong Cooperation on Fisheries, Aquatic Resources and Wetland: 20 years lesson learnt, organized on 12-14 November 2014 in Phnom Penh, Cambodia.
  - b) The discussion to explore the needs and opportunities of NGF supporting with the Concept Notes or project/activity proposal is needed with facilitated by SEAFDEC and MRC-FP.

Thank you,

## STATEMENT

*By Mr. Peter Funegård  
Swedish Agency for Marine and Water Management (SwAM)*

Dear Friends,

First of all we would like to thank SEAFDEC for the kind invitation to this important meeting. It has been very interesting to hear about the work performed during 2014, and it is really impressive and interesting for us to be able to learn more about all ongoing activities in South East Asia. It is also clear that the work planned for 2015 will continue to advance the important work carried out by SEAFDEC, and the SEAFDEC Member Countries and ASEAN to make the fisheries and aquaculture sectors more sustainable in the region.

As presented earlier today, Sweden and SEAFDEC has an on-going cooperation over five years until 2017 towards this overarching goal. The four project areas are:

- Coordination of fisheries and habitat management
- Management of fishing capacity
- Destructive and illegal (IUU) fishing
- Regional and sub-regional fisheries management mechanisms and agreements

These areas are fully in line with SEAFDECs´ five working thrusts. The Project has a focus on four sub-regions; The Gulf of Thailand, the Andaman Sea, The Sulu-Sulawesi Seas and The Mekong River Basin.

The ultimate target group of the project is the poor coastal and inland communities who face declining catches and increased competition and conflict over the use of natural resources in coastal and inland waters. Of major importance to sustainable use of marine and aquaculture resources is also some more social oriented issues like Gender equality (men, women and children) and rights issues, *e.g.* decent working conditions for fisher folks and employees in processing plants (mainly women). The project will give these issues the attention they deserve.

The private sector in fishing and aquaculture throughout the value chain (small scale fisher folk, large scale fishing companies, processing plants, traders, exporters, importers, supermarket chains etc.) are powerful “change agents”. The majority of these small and large companies are interested in a long term and sustainable business, and they are the ones to follow and implement the regulations that follow from agreements between the countries in South East Asia as well as international agreements. Therefore it is important to involve and consult them in the work on concrete measures towards long term sustainability, including technical oriented development projects as well as policy making.

A concrete example on this is the on-going cooperation between the Swedish company ORKLA/Abba Seafood (importer) and Thai processing plants (exporter) for sustainable fishing of tonggol tuna. In addition to that project, the Swedish Agency for Marine and Water Management in cooperation with SFP (Sustainable Fisheries Partnerships), is preparing a proposal for pilot project related to improved traceability of tonggol catches which are landed in Thailand. The purpose of that project is mainly to assist fish processing companies and DOF in Thailand in their ongoing work to collect necessary data and information which are required to monitor and control the fishing of neritic tuna species such as tonggol. The long term objective is to provide enough information about the fishery to make it possible for the involved companies to have their fish products certified by relevant organizations in order to be allowed to continue export of tuna products.

Even if it is obvious that most of the concrete work must be carried out at a national and local level, this work must take its departure from improved regional cooperation. The simple reason is that many of the issues and problems are shared and the solutions are usually very complicated and complex. Sweden as a Member Country in the European Union has a long and positive experience from such regional and sub-



regional cooperation with several of the unions 28 countries and also within a Nordic context with important fishing countries like Norway and Iceland. The long term cooperation between Sweden and SEAFDEC has already started to bear fruit through a range of regional resolutions, some bilateral projects and joint action plans and support to various national efforts in addressing habitat and fisheries management and the management of fishing capacity. A fundamental aim behind the continued Swedish cooperation with SEAFDEC is to provide support for joint efforts by the Member Countries within the framework of regional cooperation within the programme, and also to reach out to, and support, the ASEAN relevant working groups, primarily on fishery and aquaculture.

SEAFDEC's Member Countries are ASEAN members or dialogue partner to ASEAN. Therefore Sweden encourage the SEAFDEC project to engage with, support and work with the ASEAN-secretariat, the relevant ASEAN Working groups and the ASEAN Member States. In this respect we will also second a Swedish expert to the SEAFDEC-secretariat mainly to advise and support SEAFDEC in terms of improving the regional dialogue on emerging issues of regional and international concern of relevance to the fisheries sector/fishing industry as well as in support to the implementation of the SEAFDEC-Sweden Project. The work will also include to follow-up on developments within ASEAN and provide advice to SEAFDEC on aspects of importance to the integration of the fisheries sector into the ASEAN Community and the ASEAN Socio-Cultural Community Blueprint and the ASEAN Economic Community Blueprint.

Sweden also encourages other Sweden-supported programmes like Mangroves for the Future (MFF) and Bay of Bengal Large Marine Ecosystem (BOBLME) to do the same. This would be an effective way to make the most out of the resources and results from these programmes. For the same reason Sweden also encourage these programmes to link up with each other and cooperate as much as possible. In fact, this is partly already taking place, *e.g.* in a joint training course at the AIT in Coastal Zone Management, in capacity building for restoration of mangroves and in facilitation of country to country dialogue on shared waters and coastal ecosystems. In this context it is also encouraging that SEAFDEC now links up and coordinate more with the Mekong River Commission (MRC) and other actors in the planning and design of the SEAFDEC future activities within the Mekong river basin.

Finally, we hope that Sweden's support could contribute to consolidate SEAFDEC's position as the ASEAN fisheries technical expert and advisory body, which would be timely, given the increased demands on ASEAN's future fisheries and aquaculture policies and regulations that could be anticipated from the formation of the 'ASEAN Community by 2015' and in the continued work towards AEC 2020. It is our strong belief that SEAFDEC, being a competent and strong expert-body, could strengthen this important work and generate a range of new opportunities for the Region's fisheries and aquaculture sectors.

Thank you for your attention!

## STATEMENT

*By Mr. Timothy P. Moore*

*ASEAN-U.S. Project on Maximizing Agriculture through Knowledge,  
Enterprise Development, and Trade (USAID MARKET Project)*

The USAID Maximizing Agricultural Revenue through Knowledge, Enterprise Development and Trade (MARKET) Project is funded by the U.S. Agency for International Development (USAID), and is part of Feed the Future, the U.S. Government's Global Hunger and Food Security Initiative. The project is working with stakeholders in the Association of Southeast Asia Nations (ASEAN) region to promote more sustainable and efficient use of aquaculture and fishery resources through multi-stakeholder dialogue and partnerships. We believe that collective action by multiple stakeholders is essential to developing fisheries and aquaculture industries for the future in the ASEAN region that are profitable, sustainable and inclusive.

SEAFDEC has been a key technical partner for the project since 2012 and will continue to be through the project's completion in March 2015. Collaboration has been demonstrated through the strengthening of the ASEAN Public-Private Taskforce for Sustainable Fisheries and Aquaculture (Taskforce) as an effective regional platform for public-private dialogue. The Taskforce brings together government officials, private sector associations, small holder farmer/fisher organizations, SEAFDEC and development partners to discuss, prioritize and take joint-action on regional issues critical to the sustainable and inclusive growth of wild-capture and aquaculture industries in the ASEAN region.

As the official technical advisor to the Taskforce, SEAFDEC has contributed to strengthening the Taskforce by providing input on: (1) the development and implementation of several regional public-private activities; (2) the Ministry of Marine Affairs and Fisheries of Indonesia's proposal to continue the efforts of the Taskforce beyond March 2015 (completion date of the USAID MARKET Project); and (3) presentation of ASEAN-SEAFDEC activities relevant to the Taskforce priorities.

Through March 2015, we look forward to continued collaboration with SEAFDEC on:

- Developing the direction and mechanism to continue the Taskforce beyond March 2015. At the 3<sup>rd</sup> Meeting of the ASEAN Public-Private Taskforce for Sustainable Fisheries and Aquaculture held on 19-20 November 2014, in Malaysia, the Taskforce focal points agreed in principal to Indonesia's proposal to serve as the future coordinator of the Taskforce through an ASEAN Public-Private Center for Sustainable Fisheries and Aquaculture based in Jakarta, Indonesia. In the next few months, the Ministry of Marine Affairs and Fisheries Indonesia will convene strategic focus group meetings and conduct outreach with Taskforce's focal point members, SEAFDEC and other potential partners to develop the framework, objectives and structure for this Center. We look forward to SEAFDEC and its Member Countries active involvement in this strategic planning process in early 2015.
- Completing and sharing lessons from the initial phases of Taskforce activities. The four public-private activities that have been implemented through Taskforce include: (1) Aquatic Animal Health Management in the ASEAN Region; (2) Zonal Aquaculture Sector Planning to Address Aquatic Animal Health Management and Disease Prevention in ASEAN; (3) Development of a Regional Fisheries Improvement Project (FIP) Protocol for the ASEAN Region; and (4) Improving Feed Management Practices in Aquaculture. The project looks forward to SEAFDEC's continued participation and contribution at activity events and training programs in early 2015; technical guidance on key activity outputs such as the standard operating procedures for the responsible movement of live aquatic animals in ASEAN; and as appropriate sharing and communicating relevant training materials and reports through its website and network.



## **PROMOTING KNOWLEDGE MANAGEMENT IN SEAFDEC AND THE MEMBER COUNTRIES**

During the Fifteenth Meeting of the SEAFDEC Information Staff Program (ISP) held in Manila, Philippines from 28 to 30 October 2014, a special mini-lecture was given by the resource person from the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), *Dr. Maria Celeste H. Cadiz*. The topic she expounded was on “Knowledge Management for Inclusive and Sustainable Agriculture and Rural Development in Southeast Asia,” which is one of the programs of SEARCA. She cited that the Knowledge Management (KM) scheme of SEARCA revolves around the aspects of adaptive and social learning, knowledge sharing and use, and knowledge creation. Being one of the 21 regional centers of the Southeast Asian Ministers of Education Organization (SEAMEO), SEARCA which was founded on 27 November 1966, is mandated to strengthen institutional capacities in agricultural and rural development in Southeast Asia. In its Tenth Five-Year Plan (2015-2019), SEARCA works to strengthen institutional capacities in Southeast Asia toward inclusive and sustainable agricultural and rural development (ISARD) through graduate education and institutional development, research and development, and knowledge management. These programs are anchored on its strategic thrusts that promote social inclusion, environmental sustainability, and cross-cutting concerns that impact the Southeast Asia.

After the mini-lecture, the 15<sup>th</sup> SEAFDEC ISP Meeting suggested that SEAFDEC could consider promoting KM in the Member Countries. In this regard, a proposal could be raised by the Secretariat during appropriate meetings of SEAFDEC in the future. While noting that AQD had a collaboration history with SEARCA in the late 70s, the Meeting also suggested that the Secretariat could review such collaboration and that SEAFDEC should explore the possibility of establishing enhanced collaboration with SEARCA in the aspect of public education in conservation and sustainable use of fishery resources in the future.

In a similar development, the 15<sup>th</sup> SEAFDEC ISP Meeting suggested that SEAFDEC could also refer to the SEAMEO Regional Centre for Education for Science and Mathematics (RECSAM) for some of the requirements of SEAFDEC related to fisheries education as these could be addressed under the RECSAM framework, and thus, SEAFDEC could also consider the possibility of collaborating with RECSAM for its requirements. RECSAM is a multinational educational corporation with headquarters in Penang, Malaysia. Since its inception in 1967, RECSAM has assisted in the principal development of educational manpower and served as a catalyst for the advancement of science and mathematics education at the primary and secondary school levels for its Member Countries, namely: Brunei Darussalam, Cambodia, Indonesia, Lao Peoples' Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor Leste and Vietnam. RECSAM has also been offering teachers and educators training opportunities to improve their skills and make them more adaptable to the changing educational environment.

### **REQUIRED CONSIDERATION BY THE PROGRAM COMMITTEE**

The Committee is requested to take note of the recommendations of the 15<sup>th</sup> SEAFDEC ISP Meeting. The Committee is also invited to provide recommendations and way forward to promote KM in SEAFDEC and the Member Countries as well as the possibility of establishing enhanced collaboration with SEARCA in the aspect of public education in conservation and sustainable use of fishery resources in the future.



## MASTER PLAN FOR SEAFDEC'S STRATEGIC PLAN OF OPERATION (2015-2020)

### I. INTRODUCTION

1) During the recent years, SEAFDEC has formulated and implemented its programs of activities as guided by 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 of the ASEAN-SEAFDEC Member Countries in 2011); while the SEAFDEC Program Framework, comprising five Program Thrusts (adopted by the SEAFDEC Council in 2009), was also used as a frame for enhancing integration among programs and projects with similar nature. Nevertheless, the Resolution and Plan of Action cover very broad fisheries issues without clear indication on their priorities; while the SEAFDEC Program Framework is very generic and could lead to unclear interpretation, making SEAFDEC programs and projects not directed toward fisheries priority of the region. Furthermore, with the set-up of SEAFDEC that allows its technical Departments to formulate and implement their respective programs and projects in an independent manner, it is difficult to ensure that different projects implemented by Departments would generate results towards to ultimate goal of the organization.

2) The SEAFDEC Council, during its 45<sup>th</sup> Meeting in 2013 and subsequent 46<sup>th</sup> Meeting in 2014, raised concerns on the duplication and overlapping of programs and activities among SEAFDEC Departments. It was also viewed that some of the programs proposed by SEAFDEC Departments are not directly in line with the mandates of SEAFDEC; and thus, SEAFDEC programs need to be refocused to meet the priorities and needs of the Member Countries, as well as the arising global issues and requirements. During the Meeting, SEAFDEC Departments were also recommended to prioritize their programs of activities, in order that responsibilities, staff and funds could be appropriately allocated.

3) In response to the recommendation of the SEAFDEC Council, it is deemed necessary for SEAFDEC Secretariat and Departments to work together to consolidate their respective Plan of Operations, taking into consideration the SEAFDEC Program Framework, and incorporating priority fisheries issues that have been agreed upon by the Member Countries. While the five Program Thrusts would continue to be used as a framework for SEAFDEC programs and projects, it is also essential for SEAFDEC to have clearer visionary goal and long-term plan for the whole organization, in order that the future functions and operations of SEAFDEC Departments could be guided toward the similar direction. Each Department also needs to have clear goals that are supportive to the organizational goal, with strategies to achieve such goals; while the future programs and projects of SEAFDEC would also need to be consolidated and aligned with the direction of the organization. It is anticipated that the clearer goal and direction of the organization would not only allow SEAFDEC to enhance its technical capacity to address the need of Member Countries in a more efficient manner, but also facilitate the establishment of collaboration between SEAFDEC and other organizations in working towards sustainable development of fisheries in the region.

4) Toward this end, SEAFDEC organized the "Inter-Departmental Workshop for Preparation of SEAFDEC Strategic Plan of Operation" in Bangkok, Thailand from 1 to 3 October 2014. The workshop were attended by the Secretary-General, Deputy Secretary-General, and senior officials of SEAFDEC Secretariat, as well as the Chiefs, Deputy Chiefs and Special Departmental Coordinators from TD, AQD, MFRD, MFRDMD, IFRDMD. The Workshop concluded with the Master Plan for SEAFDEC's Strategic Plan of Operation (2015-2025) which will be used for further develop for the SEAFDEC Plan of Operations and Program of Works for consideration by the 47<sup>th</sup> Meeting of the SEAFDEC Council Directors in 2015.

### II. REVIEWS THE EXISTING OPERATIONAL FRAMEWORKS AND NEEDS FROM AMS

5) SEAFDEC has followed five (5) Program Thrusts since 2009. The thrusts are broad and have been used as a guideline for preparation of SEAFDEC's annual program plans since then. The five (5) thrusts pinpoints key areas (**Table1**) as follows:

Table 1. Five Program thrusts pinpointing key areas that need to be achieved.

<b>PROGRAM THRUST</b>	<b>What need to be done?</b>	<b>What SEAFDEC wants to achieve?</b>
1. Developing and Promoting Responsible Fisheries and Aquaculture for Poverty Reduction and Food Security	- Promote, enhance and enforce responsible fishing and aquaculture	- Economic conditions of fishers, fish farmers and fishing communities are maintained or getting better
2. Enhance Capacity and Competitiveness to Facilitate International and Intra-regional Trade	- Good Aquaculture Practices (GAP) - Food Safety - Compliance to conditions given by consumers and importers	- Tools, techniques and technologies introduced by SEAFDEC make fisheries products competitive
3. Improving Management Concepts and Approaches for Sustainable Fisheries and Aquaculture	- Research, develop and design fisheries and aquaculture management practices or approaches that are appropriate for the region - Tailor-made fisheries management concepts that are available to suit with sub-regions, ecosystem, zones, areas, and communities	- Sustainable fisheries and aquaculture management practices or approaches and tools are available for Member Countries to use
4. Providing Policy and Advisory Services for Planning and Executing Management of Fisheries and Aquaculture	- Policy studies, create implementation models and piloting - Information dissemination - Policy dialogue and advisory	- ASEAN-SEAFDEC's policies are applied in national/regional fisheries and aquaculture management policies
5. Addressing International Fisheries Related Issues from a Regional Perspectives	- Take lead in organization of international fisheries management conferences and events - Negotiate with international partners to implemented regional initiatives originated from SEAFDEC	- SEAFDEC becomes global change agent in sustainable fisheries management practices - SEAFDEC is influential global partner for fisheries management

6) The Program Thrusts are generic policy statements that accommodate issues as outlined in the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020. However, they do not give clear objectives/strategies nor indicate clear priority that the Departments will have to provide support in response to the mandates of SEAFDEC.

7) SEAFDEC also needs to set up the program based on the interests of ASEAN Member States through consultative meeting with Program Committees. In 2013, the Program Committees have identified program areas which are grouped into seven (7) components/issues, which were subsequently endorsed by the SEAFDEC Council in 2014, as shown below:

**Component-1: Fisheries management**

- Fisheries resource conservation
- Combatting IUU fishing
- Good fisheries management practices
- Co-management / community-based management
- Vessel registration and fishing licensing

**Component-2: Fishing technologies and practices**

- Appropriate technology for responsible fishing
- On-board fish handling technologies
- Small scale fishing
- Advanced technology and energy-saving fishing gears

- Component-3: Post-harvest technology and trade-related issues
- Quality of fish products
  - Traceability and certification of fish products
  - Mainstreaming small scale fisheries in market economy
- Component-4: Sustainable aquaculture
- Good Aquaculture Practice
  - Development of feeds
  - Environment-friendly aquaculture
  - Appropriate aquaculture technology
- Component-5: Fisheries information and statistics
- Fisheries database, data sharing and utilization
  - Fisheries data for plans and policies
- Component-6: Human Resource Development
- Region-wide capacity development strategies and plan
- Component-7: Inland Fisheries
- Habitat conservation and rehabilitation
  - Ecosystem approach to inland fisheries
  - Co-management and alternative livelihood
  - Inland fisheries local institutional empowerment
  - Combating IUU fishing in inland fisheries
  - Inland fisheries to food security

8) When considering the 5 Thrusts as super goals of SEAFDEC and the 7 components mentioned in paragraph 7 as program focus areas, the coherent of both is mapped into the following matrix (**Table 2**). There is different degree of concern the program committees gave in respective to existing thrusts. This mapping shows objectivity of the thrusts and it could lead to meaningful actions.

9) It is clear from the analysis that Program Committees gave high weight to fisheries resources management, fish handling on-board, traceability, small-scale fishing and capacity building. This map helps SEAFDEC to identify future operational areas under the thrusts as well as following deliberations of the Program Committees.

Table 2. Matrix of the identified future operational areas in relation to the program thrusts

<b>Programs Alignment</b>	<b>THRUST-1 Poverty reduction and food security</b>	<b>THRUST-2 Capacity and Competitive ness on Trade</b>	<b>THRUST-3 Managemen t Concepts and Approaches</b>	<b>THRUST-4 Policy and Advisory Services</b>	<b>THRUST- 5 Internatio nal Fisheries Related Issues</b>
<b>Component-1: Fisheries management</b>					
1.1 Fisheries resource conservation	X		X	X	
1.2 Combatting IUU fishing	X	X	X	X	X
1.3 Good fisheries management practices	X		X		X
1.4 Co-management/community-based management	X		X	X	
1.5 Vessel registration & fishing licensing			X		
<b>Component-2: Fishing technologies and practices</b>					
2.1 Appropriate technology for responsible fishing	X			X	
2.2 On-board fish handling technologies		X		X	



2.3 Small scale fishing	X		X		X
2.4 Advanced technology and energy-saving fishing gears				X	X
<b>Component-3: Post-harvest technology and trade-related issues</b>					
3.1 Quality of fish products		X		X	
3.2 Traceability and certification of fish products		X		X	X
3.3 Mainstreaming small scale fisheries in market economy	X	X	X		
<b>Component-4: Sustainable aquaculture</b>					
4.1 Good Aquaculture Practice	X		X	X	
4.2 Development of feeds			X	X	
4.3 Environment-friendly aquaculture	X		X		
4.4 Appropriate aquaculture technology			X	X	
<b>Component-5: Fisheries information and statistics</b>					
5.1 Fisheries database, data sharing and utilization			X		X
5.2 Fisheries data for plans and policies			X	X	
<b>Component-6: Human Resource Development</b>					
6.1 Region-wide capacity development strategies and plan		X	X	X	
<b>Component-7: Inland Fisheries</b>					
7.1 Habitat conservation and rehabilitation			X	X	X
7.2 Ecosystem approach to inland fisheries		X	X	X	X
7.3 Inland fisheries local institutional empowerment	X	X	X		
7.4 Co-management and alternative livelihood	X	X	X		
7.5 Combating IUU fishing in inland fisheries	X	X	X	X	X
7.6 Inland fisheries to food security	X				

### III. SEAFDEC AS TECHNICAL ARMS TO ASEAN IN FISHERIES AREA

10) In 2007, ASEAN and SEAFDEC signed the Letter of Understanding (LOU) on ASEAN-SEAFDEC Strategic Partnership. This partnership introduced ASEAN Sectoral Working Group on Fisheries (ASWGF<sub>i</sub>) as a mechanism to backup coordination and interaction between two entities. As of now, but according to the LOU this can be changed, the Fisheries Consultative Group (FCG) is a technical advisory body that considers whether technical areas proposed by SEAFDEC are acceptable. If FCG endorses the proposals ASEAN-SEAFDEC will implement the programs and activities. (page 3, item (1) of the LOU)

- 11) The important scope of partnership SEAFDEC should keep in mind are:
1. ASEAN's vision for fisheries is "To be a leader in Sustainable Tropical Fisheries for the People"
  2. ASEAN considers fishery sector as part of ASEAN Economic Community (AEC) and states that fisheries sector is part of economic integration domain;
  3. Address importance of participation of AMS;
  4. The technical areas under this partnership cover: 1) fisheries development, 2) fish trade, 3) food safety, 4) food security, 5) sustainable management of fisheries resources, 6) rural livelihood development, and 7) the implementation of regional policies on the three issues;
  5. ASEAN-SEAFDEC partnership includes cooperation to implement capacity development programs and HRD on the issues mentioned in (4)

12) Noted that the future operational areas under the thrusts as well as following deliberations of the Program Committees as shown in Table 2 are aligned with the ASEAN requirements under the ASEAN-SEAFDEC Strategic Partnership mechanism. In this connection, SEAFDEC further identify SEAFDEC functions in the next 5-10 years as appeared in Article IV.

#### **IV. FUTURE FUNCTIONS OF SEAFDEC**

13) Following deliberations of the Program Committees, identified future areas, aligning the goal of ASEAN in fisheries perspectives and future collaboration with others regional/international organization and concerned stakeholder, SEAFDEC therefore proposed the future functions of SEAFDEC are as follows:

- A) **Providing Policy Guidelines and Facilitating Policy Formulation:**  
SEAFDEC will maintain its one of the core functions in providing advice and guidance for the AMS to develop policy guidelines on fisheries management.
- B) **Dissemination and Generation of Information to Support Policy Formulation:**  
This function is an on-going one and is in progress. It will need to give more emphasis to the relevance and usability of data and information SEAFDEC collects and produces. It should have well organized data set and recording system as well as an easy gateway for the users to access. It requires well connecting information networks centered at SEAFDEC's Secretariat and link it with information centers of the Departments.
- C) **Research and Development:**  
SEAFDEC will keep its R&D function to explore new scientific methods for fisheries resource conservation, production and utilization. The R&D activities produce solutions to solve problems and examine new management tools which then support the development of policies, management models and measures.
- D) **Technology Transfer, Capacity Building and Training Function:**  
This function anticipates the future fisheries management policies and tools, in addition introduce it to AMS through effective capacity enhancement processes. The training function should position itself as strategic unit investing to develop AMS.
- E) **Monitoring and Surveillance:**  
Aiming to become world leader in fisheries management policy and tightening up with ASEAN's policy mechanism, SEAFDEC aims to strengthen its oversee role to monitor AMS's adoption and implementation of policies. SEAFDEC will applies result-based monitoring and evaluation system to determine viability and worthiness of adoption. In future, SEAFDEC is to be more proactive to handle the outliers by realizing urgent matters ahead of time and starting surveillance system.

#### **V. SEAFDEC ROADMAP AND GOALS FOR 2015-2020**

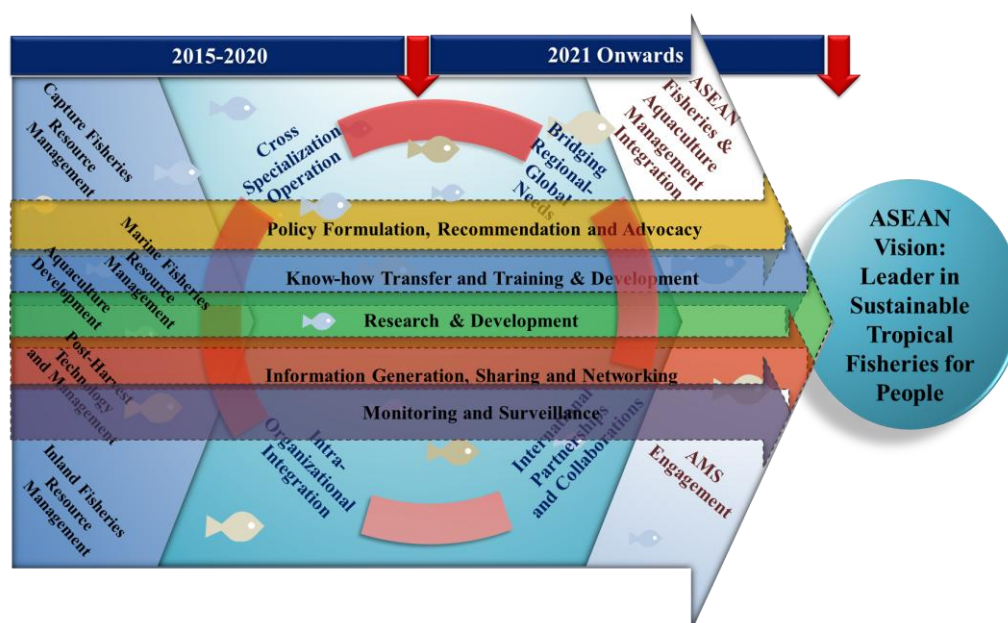
14) SEAFDEC envisions that the organization will become the regional excellence center in tropical fisheries management policy of ASEAN. SEAFDEC excel its expertise and highly experienced team in five (5) disciplines namely: capture fisheries, aquaculture, marine fisheries, inland fisheries and post-harvest management. With over forty-seven (47) years of practical experience in these fields and cooperation the organization have tighten with national fisheries agencies SEAFDEC well understand problems and recognize barriers in fisheries and aquaculture management.

15) Having the five (5) disciplines as a basement of scientific knowledge and technical capability, the Center keeps lifting up the learning curve of internal coordination and interaction, operating in multidisciplinary mode, responding to needs and interests of international stakeholders and fostering engagement of technical collaborators and policy makers in the AMS. SEAFDEC will have to continue persuade the national fisheries agencies, especially the members of the working group on fisheries to participate actively and be accountable for commitments that have made. With the support of the ASSP, SEAFDEC takes the lead to integrate vital regional concerns in the policies and guidelines. Inputs and ownership of the policies are of the Member Countries, they take responsibility to translate into actions. The most important intervention is increasing engagement of the AMS. The Center should move one step further to address the question on "how" to engage rather than following the same process / mechanism

that dilute sense of belonging. Once AMS is fully engaged and keep moving, SEAFDEC will have more time to generate initiatives and new policies to help the region. The organizational development roadmap of SEAFDEC is shown in **Figure 1**.

16) In the planning workshop organized in Bangkok during 1-3 October 2014, SEAFDEC has identified its long-term goals which guide all functions and departments into the same directions. The goals were shaped under the scenario everybody envisioned to increase SEAFDEC’s visibility in the region as well as to mainstream administrative and management processes into ASEAN policy mechanism. The long-term goals are:

- Regional Policies/Guidelines on Important Emerging Issues on Fisheries and Aquaculture are Adopted and Implemented
- Safe and Quality Fish and Fishery Products for ASEAN
- Fisheries Resources in ASEAN are Maintained and Sustainably Managed
- Data and Information are Relevant and Supportive to Policy Formulation and Public Use
- Capability of Government Staff of AMS are Enhanced to Adopt and Nationalize ASEAN Policies



**Figure1.** The organizational development roadmap of SEAFDEC

## VI. GOAL AND STRATEGIES OF SEAFDEC’S SECRETARIAT AND THE DEPARTMENTS

SEACRETARIAT	
<b>GOAL 1</b>	SEAFDEC’s Departments and AMS receive supports and assistance from the Secretariat to develop ASEAN regional policies and guidelines on fisheries and aquaculture for adoption by AMS
	Strategy 1 Enhance participation of the Departments and AMS in policy dialogue and consultation forum for formulation of regional policies and guidelines on fishery and aquaculture
	Strategy 2 Encourage rigor engagement of AMS to support the endorsement of the regional policies and guidelines
	Strategy 3 Create buy-in of high authority of ASEAN for the adoption of the regional fishery and aquaculture policies
<b>GOAL 2</b>	ASEAN standards to enhance intra-regional/international trade are aligned with relevant international standards
	Strategy 1 Benchmark the new standards with prominent international organizations / bodies
	Strategy 2 Engage the Departments, AMS and relevant agencies to formulate guidelines for

		the ASEAN Standards
	Strategy 3	Raise awareness and support adoption of ASEAN Standards by AMS's inspection and regulatory bodies
<b>GOAL 3</b>	AMS and SEAFDEC jointly monitor the adoption and implementation of ASEAN regional policies and guidelines	
	Strategy 1	Establish regional platform and mechanism for monitoring and evaluation of the effectiveness of the regional policies and guidelines
	Strategy 2	Empower AMS to feedback and report effectiveness, outcomes and lessons from national level
<b>GOAL 4</b>	Prominent international organizations and donor agencies are interested to collaborate and partner with SEAFDEC	
	Strategy 1	<i>Map regional development strategies of SEAFDEC with that of international organizations and donor agencies</i>
	Strategy 2	<i>Explore important points of entry to promote international collaborations and partnerships</i>
	Strategy 3	<i>Create platform for regular consultations and dialogues with potential international organizations and agencies</i>
<b>GOAL 5</b>	National agencies are satisfied with fishery and aquaculture data and information disseminated by SEAFDEC	
	Strategy 1	Develop tools and mechanism to collect data and generate information that are highly relevant for policy formulation
	Strategy 2	Maintain reliability and usability of data and information
	Strategy 3	Develop platform and tools to transform data into well-packaged information to support regional and national policy formulation
<b>GOAL 6</b>	AMS contribute resources and strongly support SEAFDEC to undertake actions on emerging issues	
	Strategy 1	AMS and SEAFDEC jointly implement fisheries management surveillance framework and develop effective reporting mechanism for emerging issues
	Strategy 2	Engage key policy makers in AMS in preparing long-term regional plan and resource mobilization plan for emerging issues
<b>TRAINING DEPARTMENT</b>		
<b>GOAL 1</b>	AMS apply innovative fisheries management tools jointly developed by SEAFDEC and relevant national line agencies based on EAFM concept	
	Strategy 1	Tailor-made EAFM concept to suit with ASEAN region context
	Strategy 2	Raise awareness and support the application of EAFM in the AMS in form of operational guideline
<b>GOAL 2</b>	Reduction of IUU fishing activities in the ASEAN region	
	Strategy 1	Assessing current status of the IUU fishing and examine negative impacts in the AMS and the whole region
	Strategy 2	Develop ASEAN policy recommendations and guidelines on the IUU fishing countermeasures
	Strategy 3	Support the development and use of effective IUU fishing countermeasures in collaboration with AMS and relevant regional/international organizations
<b>GOAL 3</b>	Post-harvest losses reduced through developing of tools and improving of fish handling on-board	
	Strategy 1	Research on practices leading to post-harvest losses in different types of fishing activities in the AMS
	Strategy 2	Develop effective solutions to reduce post-harvest losses and recommend to AMS on methodologies for effective fish handling onboard
	Strategy 3	Support AMS to educate fishers and fishing operators on methods to reduce losses and improve fish handling onboard
<b>GOAL 4</b>	Fisheries resources are enhanced in AMS through the establishment of appropriate fisheries resource enhancement measures/tools	
	Strategy 1	Collaborate with academic institutions in AMS to review the scientific data and information on critical habitat of historical life cycle of fish
	Strategy 2	Develop fisheries resource enhancement measures and engage stakeholders in decision making
	Strategy 3	Engage AMS to adopt appropriate fisheries resource enhancement measures / tools
	Strategy 4	Continuously promote implementation of appropriate fisheries resource

		enhancement measures / tools in AMS
<b>GOAL 5</b>	SEAFDEC has human resource development platform to enhance technology transfer on fisheries management and development	
	Strategy 1	Develop HRD platform and standards process to deliver capacity development programs and modules
	Strategy 2	Map training needs and develop 5 years training master plan for SEAFDEC government staff in the AMS
	Strategy 3	Mobilize resources for implementation of capacity development programs
	Strategy 4	Update regularly capacity development programs in accordance with emerging needs in AMS and the region
<b>AQUACULTURE DEPARTMENT</b>		
<b>GOAL 1</b>	AMS adopt good aquaculture practices and science-based technologies introduced by SEAFDEC	
	Strategy 1	Assessing of stakeholders specific needs and requirements for aquaculture technologies
	Strategy 2	Repackage and pilot know how and appropriate technologies based on priorities partnership program
	Strategy 3	Strengthen and sustain collaboration and partnerships with relevant stakeholder groups on aquaculture
	Strategy 4	Accelerate adoption and extension in AMS
<b>GOAL 2</b>	Private sector and farmers are capable in implementing sustainable aquaculture	
	Strategy 1	Enhance capacity development intervention through need-based sustainable aquaculture programs
	Strategy 2	Introduce affective feedback mechanism to enhance measurable results of training programs
<b>GOAL 3</b>	AMS aware of importance of preparedness for climate risk prevention	
	Strategy 1	Assess and raise awareness on the fish species that are vulnerable to climate risk
	Strategy 2	Engage private sector and farmers in preparing long term plan for climate risk prevention
	Strategy 3	Develop guideline for preparation of risk assessment and impact mitigation plan for the AMS to prevent impacts on aquaculture production
<b>MARINE FISHERIES RESEARCH DEPARTMENT</b>		
<b>GOAL 1</b>	AMS adopt policy recommendations on optimum utilization of under-utilized fish resources for human consumption	
	Strategy 1	Promote development of value-added fish products which are acceptable to consumers and have competitive market value
	Strategy 2	Engage AMS to formulate national guidelines for economically sound utilization of fish resources
<b>GOAL 2</b>	Adoption of appropriate fisheries post-harvest technologies and practices in AMS	
	Strategy 1	Enhance application of post-harvest technologies and practices directed towards optimizing utilization of under-utilized fish resources for human consumption in relevant government agencies and industries
	Strategy 2	Engage AMS to develop post-harvest practices and technologies for economically sound utilization of fish resources
	Strategy 3	Develop post-harvest programs to transfer know-how to extension agencies, communities and industries in the AMS
<b>GOAL 3</b>	AMS ensure fish and fishery products to comply with food safety requirements and or standards	
	Strategy 1	Assist ASEAN to harmonize food safety requirements and or standard for local fish and fishery products in AMS line with international requirements and or standards
	Strategy 2	Improve and enhance the use of traceability system for fish and fishery products in AMS
	Strategy 3	Enhance regional laboratory capabilities to support inspection and testing of fish and fishery products to ensure compliance to food safety requirements and or standards
<b>MARINE FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT</b>		
<b>GOAL 1</b>	AMS collaborate in assessing status of shared stock and plan for appropriate interventions	

	Strategy 1	Regularly examine existing status and monitor current change of shared stocks
	Strategy 2	Assess stock of commercially important and/or endangered species for every 5 years
	Strategy 3	Develop mechanism for engaging AMS to assess and update status of shared stock
<b>GOAL 2</b>	Information and reports on shared stocks are with key actors in AMS	
	Strategy 1	Encourage participation of AMS to compile information on status of shared stock of commercially important and/or endangered species
	Strategy 2	Report of stock assessments results and provide policy recommendations for management of shared stocks in AMS
	Strategy 3	Engage AMS to formulate policies on shared stock
<b>GOAL 3</b>	AMS follow the guideline and are able to conduct stock assessment at national level	
	Strategy 1	Enable AMS to formulate stock assessment and related practices
	Strategy 2	Update knowledge and skill of AMS staff to perform methods stock assessment
<b>GOAL 4</b>	Regional policies / guidelines on important emerging issues on marine fisheries are adopted and implemented by AMS (for boosting inter/intra-regional trade)	
	Strategy 1	Formulate regional policies and guidelines in response to emerging issues on capture fisheries
	Strategy 2	Engage AMS to implement the guideline ( <i>e.g.</i> Catch Documentation Scheme) for ASEAN with technical support from SEAFDEC
<b>INLAND FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT</b>		
<b>GOAL 1</b>	IFRDMD has baseline information on policies and regulations related to inland fisheries in AMS	
	Strategy 1	Gather and compile information related to inland fisheries policies and regulations from the AMS
	Strategy 2	Provide accessibility of the information through collaboration with the AMS
<b>GOAL 2</b>	AMS are aware of status of the inland fisheries resources in the region	
	Strategy 1	Assess applicability of existing scientific data and information, and effectiveness of data collection tools
	Strategy 2	Develop inland fisheries scientific data collection mechanism and guidelines
	Strategy 3	Engage AMS and relevant agencies in collection of scientific data and generation of useful information for policy formulation
	Strategy 4	Increase visibility of IFRDMD as information hub for inland fishery research and development
<b>GOAL 3</b>	In close collaboration with AMS, policy recommendations and guidelines on inland fisheries management are formulated	
	Strategy 1	Formulate and disseminate policies and guidelines on inland fisheries management in AMS
	Strategy 2	Support adoptability of policies and guidelines on inland fisheries management by the AMS

17) Refers to the SEAFDEC GOALS and Strategies described in Article VI, the work plan/activities of each strategy needs to be developed and in principle it should aligns with the future Plan of Operation for each Departments and secretariat as follows:

- A. **The Secretariat Office** clearly elaborates that their main focuses are to provide support for formulation of policies and guidelines to support fisheries management in the AMS. The office will also facilitate and coordinate to enable SEAFDEC to implement activities related to emerging issues. As the Secretariat, the office continues to coordinate data collection, information dissemination and increase accessibility of the information by end users. The office staff will make sure information are in the forms that can be used for policy formulation.
- B. **The Training Department** focuses on capture fisheries and the prime concerns are on fisheries resources enhancement and applications of new resources management tools for fisheries resources management. The department is responsive to the immediate needs in the AMS and to the emerging issues such as climate change, combating IUU fishing, etc. Being the SEAFDEC's training center, the department is keen to develop more systematic and robust training platform that addresses long-term strategies for in-house staff development programs and capacity development programs for the AMS.

- C. **The Aquaculture Department** continues to be proactive to response to high demands for technical supports in aquaculture sector. It will address aquaculture technologies that are friendly to environment, prevent impacts cause by climate change. Emphasis is also given to Good Aquaculture Practices which will enhance quality of aquaculture products. In long-term, the Department aims for sustainable aquaculture.
- D. **The Marine Fisheries Research Department** gives concerns on improving standard of post-harvest fish and aquaculture products to meet minimum requirements on food safety. The Department will support setting up regional standard and promote compliance of this standard in AMS. It will promote a common standard for both for domestic consumption and for export.
- E. **The Marine Fishery Resources Development and Management Department** gives priority to shared stock management. It emphasizes on data acquisition and assessing resent status of fish stock in the AMS. The department will use advanced methods to support shared stocked management measures and actions.
- F. **The Inland Fishery Resources Development and Management Department**, in its inception plan, has given concerns on understanding status and scenarios of inland fisheries and aquaculture practices in the AMS. This sector has been ignored and the department envisions that the inland fisheries development is a mean for poverty alleviation. The policies will gear towards improving economic and quality of life of fish and aquaculture farmers in backward areas in the AMS and other sub-regions.

## VII. REQUIRED CONSIDERATION BY THE MEETING

The Program Committee is requested to take note on the development of the Master Plan for SEAFDEC's Strategic Plan of Operation (2015-2020) where the Department's Goals and its Strategies are identified aligning with the future Plan of Operations for each SEAFDEC Department and Secretariat. The Program Committee is also invited to provide comments or suggestion and support in order to improve the Master Plan for further revision of the present Plan of Operation and Program of Works for further submitted for consideration by the 47<sup>th</sup> Meeting of the SEAFDEC Council in 2015.

## **MONITORING AND EVALUATION OF SEAFDEC PROGRAMS FOR 2015 AND ONWARDS**

### **I. INTRODUCTION**

Refers to the 32<sup>nd</sup> PCM 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 34<sup>th</sup> PCM 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 45<sup>th</sup> Meeting of the Council 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. In view of the foregoing, The Secretariat plans to introduce a more specific and useful format which include the analysis of the project background, logical framework, and so on.

Secretariat considers the recommendations and suggestions by SEAFDEC program committee and council directors while SEAFDEC examines the causes that may reduce the efficiency of project implementing and reporting as well as project planning, monitoring, and evaluation process. One of the main causes is that most of SEAFDEC program are activity-based project in case it is quite difficult to align the achievements/results with the objectives and/or goals. Secretariat also examines the document template/format that make difficulty to evaluate the results after implementation.

### **II. RESULTS-BASED MANAGEMENT (RBM) APPROACH**

Taking into accounts many national institutions, regional, international organizations such as ASEAN-Secretariat, UNEP, GEF apply the Results-Based Management (RBM) - a management strategy which uses feedback loops to achieve strategic goals - that support the planning, monitoring and evaluation processes. Recently SEAFDEC is also urged to make use the RBM for enhancing the effectiveness management of SEAFDEC programs. Secretariat, therefore purposes a new template of the project document as enclosed herewith in **Appendix 1**. The evaluation form, which aims to compile the views of the Member Countries on the performance of the implementation of SEAFDEC projects is also enclosed in **Appendix 2**. The said project document is results-based management that is modified to be used by all SEAFDEC department and secretariat. The template is applied for all ongoing projects from past years and a new project starting from 2015 under the FCG/ASSP mechanism.

The new project documents consists of 4 Parts: Part1) Overall project description includes briefs project description, background and justification, expected outcomes, and log frame on project follow-up, monitoring and evaluation with refers to outputs, indicators and activities (Figure 1). In addition this part includes overall scope/description of project activities, proposed budget for a whole period (for new project); Part 2) Proposed activities, work plan and estimated budget for the following year; Part 3) Achievement of the past year activities, the table of activities conducted including type identify type of activity, number of participants, and total budget spent for each activities. The log-frame of outputs-monitoring is in the table include achievement based on key performance indicator set in the past year. This part also includes list of completed publication for submission to the Secretariat for compilation, project outcomes and lesson learned, and major impacts/issues; Part 4) Evaluation for annual, mid-term, and long term and end of the project. This part will be evaluated by project leader and program committee using the evaluation criteria appeared in **Figure 2**:



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

Outcomes	Outputs	Activity	Key Performance Indicators
<b>Outcome 1:</b> 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.	<b>Output 1:</b> Increased the capacity of ASEAN Member States to address the regional interest and common positions that link to the international fish trade-related issues,	<b>Activity 1:</b> Monitoring & Enhancing the Capacity on International Fish Trade-related Issues	<ul style="list-style-type: none"> <li>➤ At least one exclusive summary/ report(s) on the Status of specific subjects under International Fish Trade-related Issues for each year to be submitted to FCG/ASSP Meeting for endorsement</li> <li>➤ At least 50% of AMS involve and/or participate to the Important international events such as CITES, Market measures, etc.</li> </ul>

Figure 1

Table 8 Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>	<b>EFFICIENCY</b>	
<i>How well did the Results contribute to the Achievement of the project purpose/ objectives?</i>	<b>EFFECTIVENESS</b>	
<i>Which has benefited on society and sector?</i>	<b>IMPACT</b>	
<i>Have products and benefits been maintained?</i>	<b>SUSTAINABILITY</b>	

Figure 2

### III. ADVANTAGE OF THE PROJECT DOCUMENT

Figure 3 show the Table 5 of the project document that all list of activities conducted including the involved stakeholders and budget spent are recorded based on the 6 types of activities namely: i) Research and Development activities, ii) Training activities, iii) Information activities, iv) Policy development activities, v) Collaborative Program for SEAFDEC Research Vessels, and vi) Others. The table 5 will record many important data and information for computing the ratio of activity-based budget/funds. The list and numbers of participants from Member Country, SEAFDEC and other stakeholders such as resources persons from international and regional organizations will be recorded. Furthermore, the list of

SEAFDEC staffs will be linked to other salary data for computing cost of manpower effort if required in near future.

Table 5. List of activity conducted including involved stakeholders and budget spent

List of <b>Actual</b> Sub-activity (1)	Type of activity*	Number of Participants			Total Budget Spent (USD)
		MCs	SEAFDEC	Others	
<b>Activity 1.1</b>					
1. Preliminary study on conservation and management of eels resources in the Southeast Asian Region	IV	0	2	5	0
2. Reviewed the issues/problems and challenge for Southeast Asian Countries to combat IUU fishing occurred within the region	IV	0	1	0	0
3. Supported the development of RFVR for 24m in length and over	IV	0	2	0	0

**Figure 3**

#### IV. INCREASED EFFICIENCY IN MANAGING SEAFDEC PROGRAMS

In SEAFDEC, particularly Secretariat has a function to manage overall SEAFDEC Programs in order to enhance the efficiency in management of overall SEAFDEC programs, the Secretariat, therefore develops the Database System as a tool for managing SEAFDEC Programs (**Figure 4**). 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 system online for SEAFDEC administrator and project leader to access using an authorized user name and password. It is expected that after trails for one year (2015), all SEAFDEC Departments responsible for SEAFDEC program/projects will input all details of the project documents and submit to Secretariat via this system online.

**Figure 4**

**REQUIRED CONSIDERATION BY THE MEETING**

The Meeting is requested to take note the ways to monitor and evaluate SEAFDEC Programs and development of the program database system as a tool to manage all programs. The Meeting is also requested to provide comments for further improving program evaluation in near future.

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

			Project id: [xyyyzzz]
<b>Program Categories:</b>	<i>Project under the ASEAN-SEAFDEC ASSP and FCG Mechanism</i>		
<b>Project Title:</b>			
<b>Program Thrust:</b>		<b>Total Duration<sup>1</sup>:</b>	2013 - 2017
<b>Lead Department:</b>		<b>Lead Country:</b>	
<b>Donor/Sponsor:</b>		<b>Total Donor Budget:</b>	
<b>Project Partner:</b>	<i>None</i>	<b>Budget for 2015:</b>	
<b>Project leader:</b>			

**PART I: OVERALL PROJECT DESCRIPTION**

**1. Brief Project Description**

**2. Background and Justification**

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

**3.1 Expected Outcomes**

- XXXX
- XXXX

**3.2 Outputs, Indicators and Activities**

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

Outcomes	Outputs	Activity	Key Performance Indicators
Outcome 1:	Output 1:	Activity 1:	- (K1) - (K2)
Outcome 2:	Output 2:	Activity 2:	- (K3) - (K4)
	Output 3:	Activity 3:	- (K5) - (K6)

**3.3 Overall Scope/Description of Project**

Table 2: Overall project description for activity

<sup>1</sup> 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.

Activity	Description
1)	
2)	
3)	

### 3.4 Activity, Sub-activity and Proposed Budget for 2013-2017 (in case of 5 year project from 2013)

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1:	Sub-activity 1.1					
	Sub-activity 1.2					
Activity 2:	Sub-activity 2.1:					
Activity 3	Sub-activity 3.1:					
.....	Sub-Total					

## PART II : PROPOSED ACTIVITIES FOR YEAR 2015

### 4. Proposed Activity/Sub-activity, Workplan and Estimated Budget for the Year 2015

Table 4 Detailed Sub-activity including inputs, period, estimated budget for 2015

(Unit: USD)

Sub-Activity	Timeframe/ period	Inputs	Type of Activity*	Proposed Budget
Sub-Activity 1.1				
Sub-Activity 1.2				
Sub-Activity 2.1:				
Sub-Activity 3.1:				

## PART III: ACHIEVEMENT OF 2014 PROJECT IMPLEMENTATION

### 5. Achievements of the Project Implementation for the Year 2014

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

#### 5.1 Activities Conducted in the Current Project: (provide list of activities)

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 (USD)
		MCs	SEAFDEC	Others	
Activity 1.1					
1.					
2.					
3.					
Activity 1.2					
1.					
2.					
3.					
Activity 2.1					
1.					
2.					
3.					
4.					
5.					

## 5.2 Output(s)

Table 6 Log frame of the Output-Monitoring

Output	Key Performance Indicator	Achievement based on indicator in Year 2014	Remarks
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,	K1		
	K2		
Output 2: Adopted/ agreed on ASEAN-SEAFDEC common position and/or coordinated position and regional policy recommendation on international fish trade-related issues	K3		
	K4		
Output 3: Increased awareness to fisheries sector and promote the regional common/coordinated positions	K5		
	K6		

Table 7 List of completed publications and others

List of completed publications for the year 2014	Type of media	attached e-file
1.	PDF	
2.	PDF	
3.	PDF	
4.	PDF	

## 5.3 Project Outcomes and Lesson Learned

Outline any emerging outcomes or lessons, if any that have been learned during the project period that could be passed on to other projects.

## 5.4 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 IV: EVALUATION

### 6. Project Evaluation

Provide brief details of progress in terms of the development and implementation of the project evaluation plan. Provide details of any interesting findings or emerging evaluation issues of interest.

Table 8 Project Evaluation (for annual, mid-term, and end of project)

Evaluation Criteria	From Project Leader	
	Views	%
<i>How were inputs and activities converted to results?</i>		
<i>How well did the Results contribute to the Achievement of the project purpose/objectives?</i>		
<i>Which has benefited on society and sector?</i>		
<i>Have products and benefits been maintained?</i>		

## EVALUATION FORM

The main purpose of this evaluation is to compile the views of the Member Countries on the performance of the implementation of SEAFDEC projects, especially with respect to the benefits that could be gained by the countries from such projects. Results of the analysis of the countries' views could facilitate the assessment of the progress of the SEAFDEC programs and projects towards achieving the desired results as outlined in the projects' work plans. In addition, the evaluation could provide donors with options to either continue funding certain projects or in a worse scenario, perhaps phasing out their support.

Moreover, the results of the evaluation could pave the way for SEAFDEC to modify the projects' work plans in order that maximum benefits could be derived by the countries from the results of such projects. This evaluation is therefore an opportunity for the Member Countries to help SEAFDEC in optimizing the projects' strengths, discuss the weaknesses and explore opportunities for improving the projects' overall performance. It could also provide an avenue for the countries to make recommendations that would address the limitations that hinder improvement of the SEAFDEC projects, and assure that desired results are achieved upon the projects' completion.

SEAFDEC National Coordinators as Members of the SEAFDEC Program Committee are requested to accomplish this Evaluation Form. As guide for evaluating the SEAFDEC projects, the basic criteria are indicated in the form as shown below. Scores should be given in a scale from 1 to 10, where 10 indicates that the project's objectives and targets have been achieved, while 1 means that the project did not attain its target at all. The average perfect score for all the criteria should be 10.00.

**Average score:**  $\geq 7.50$  objectives and target have been achieved; 5.00-7.50 partially achieved; 2.50-4.99 fairly achieved; 1.00-2.49 not achieved

<b>Project Title:</b>			
<b>Lead Department:</b>			
<b>Total Duration:</b>		<b>Year evaluated:</b>	
<b>Total Proposed Budget (US\$):</b>		<b>Budget spent as of (year):</b>	US\$

	Criteria	Score	Comments
<b>Project implementation and major outputs</b>			
1	Project activities are able to meet the desires and needs of target beneficiaries?		
2	Project activities are able to address the concerns and needs of participants/stakeholders		
<b>Relevance:</b> the extent to which the project suits the priorities and policies of target group's recipients and donors			
3	Objectives of the project are still valid with respect to the current situation		
4	Activities and outputs of the project are consistent with the overall goal and for attainment of the objectives		
5	Activities and outputs of the project are consistent with the intended impacts and effects		
<b>Effectiveness:</b> A measure of the extent to which the project attains its objectives			
6	Objectives could be achieved or are likely to be achieved		



	Criteria	Score	Comments
7	Certain factors influence the achievement or non-achievement of the objectives (Mention some in your comments)		
<b>Efficiency:</b> qualitative and quantitative measures of the outputs in relation to the inputs			
8	Project activities are cost-efficient		
9	Objectives are achieved in time		
10	Project activities spent its allocated budget efficiently and effectively		
<b>Impacts:</b> 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			
11	Changes have been made in your country resulting from the project activities		
12	Fishers and/or fish farmers have obtained benefits from the project activities		
13	Project activities enhanced visibility, collaboration and networking among countries and other agencies/organizations		
<b>Sustainability:</b> a means of measuring whether the benefits of an activity are likely to continue after the project funding is withdrawn or upon completion of the project			
14	Benefits of the project could be sustained after project ends and funding ceases		
15	Benefits received by the country from the project justify the cost (budget allocated) for implementing the project		
<b>Average Score</b>			

Please provide also additional inputs on the following aspects:

1. Ways that the project could be done differently to complete the project more effectively or on how the planned activities could be modified to meet the needs of stakeholders.
2. Should the project be continued or revised or phased out? Why?
3. Other comments.

**PROJECT DOCUMENT AND PROJECT EVALUATION FORM FOR MONITORING AND  
EVALUATION OF SEAFDEC PROGRAMS FOR 2015 AND ONWARDS**  
(As suggested by the representative from Japan)

**PROJECT DOCUMENT  
PROPOSED ACTIVITY FOR YEAR 2015 AND  
ACHIEVEMENTS FOR YEAR 2014**

				Project id: [xyyyzzz]
<b>Program Categories:</b>				
<b>Project Title:</b>				
<b>Total Duration:</b>		<b>Program Thrust:</b>		
<b>Components</b>			Priority	
<b>Issues</b>				
<b>Country involved</b>				
<b>Lead Department:</b>		<b>Lead Country:</b>		
<b>Donor/Sponsor:</b>	JTF	<b>Total Donor Budget:</b>		
<b>Project Partner:</b>		<b>Budget for 2015:</b>		
<b>Project leader:</b>				

**PART I: OVERALL PROJECT DESCRIPTION**

**1. Description of Project**

Explain briefly the overall project.
--------------------------------------

**2. Project Overall Objectives, Outcomes and Outputs**

Table 1 Outcome and Output of Project

Objective	Outcomes	Outputs
Objective 1	Outcome 1:	Output 1:
	Outcome 2:	Output 2:
Objective 2	Outcome 1:	Output 1:
	Outcome 2:	Output 2:

Table 2 Overall project description for activity, sub-activity

Activity	Description
Activity 1 Sub-activity 1.1	
Activity 2 Sub-activity 2.1	

Table 3 Proposed Budget based on activity and sub-activity for 2013-2017

(Unit: USD)

Activities	Sub-activities	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017
Activity 1	Sub-activity 1.1					
	Sub-activity 1.2					
Activity 2	Sub-activity 2.3					
	Sub-activity 2.2					

### 3. Background and Justification

Explain briefly the background and justification of the project.

## PART II : ACHIVEMENT OF 2014 PROJECT IMPLEMENTATION

### 4. Achievements of the Project Implementation for the Previous Year

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

Table 4 List of achievement of activity

Planned-activity	expected outcome/output	Achievement	Spent Budget(USD)
Activity 1			
Sub-Activity 1.1			
Sub-Activity 1.2			
Sub-Activity 1.3			
Activity 2			
Sub-Activity 2.1			
Sub-Activity 2.2			
Sub-Activity 2.3			

Table 5 List of completed publications and others (e.g. technical report, VDO, presentation file, etc.)

List of completed publications for the previous year	Type of media	attached e-file
1.		
2.		
3.		

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

Table 6 Project Evaluation

Activities	Sub-Activities	From Participants or member countries for WS, Training Course
		Views
1	1.1	
	1.2	
	1.3	
2	2.1	
	2.1	
	2.3	

**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 2015**

**7. Proposed Activity/Sub-activity, Workplan for 2015**

Table 7 Proposed Activities and Budget

DESCRIPTION OF PLANED ACTIVITIES	BUDGET(US\$)
<b>Activity 1</b>	
Sub-Activity 1.1	
Sub-Activity 1.2	
<b>Activity 2</b>	
Sub-Activity 2.1	
Sub-Activity 2.2	
<b>TOTAL</b>	

**8. Expected Outcome/Output of Activity for 2015**

Table 8 List of expected outcome/output of activity

Planed-activity	Expected outcome/output
<b>Activity 1</b>	
Sub-Activity 1.1	
Sub-Activity 1.2	
<b>Activity 2</b>	
Sub-Activity 2.1	
Sub-Activity 2.2	

Table 9 Schedule of activities for 2015

Component	Activity	Year 2015											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Activity 1</b>													
	Sub-activity 1.1												
	Sub-activity 1.2												
<b>Activity 2</b>													
	Sub-activity 2.1												
	Sub-activity 2.2												

## PROJECT EVALUATION FORM

Project id: [xyyyyyzz]

<b>Program Categories:</b>			
<b>Project Title:</b>			
<b>Total Duration:</b>		<b>Program Thrust:</b>	
<b>Components</b>		Priority	
<b>Priority Issues</b>			
<b>Country involved</b>			
<b>Lead Department:</b>		<b>Lead Country:</b>	
<b>Donor/Sponsor:</b>	JTF	<b>Project leader:</b>	
<b>Total Proposed Budget:</b>		<b>Budget spent as of (year):</b>	

### 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				
Sub-Activity 1.1				
Sub-Activity 1.2				
Sub-Activity 1.3				
Activity 2				
Sub-Activity 2.1				
Sub-Activity 2.2				
Sub-Activity 2.3				

#### 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

## PART II: EVALUATION BY MEMBER COUNTRIES

### 1. Evaluation sheet

	Criteria	Score	Comments
<b>Effectiveness:</b> 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		
<b>Efficiency:</b> 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:  $\geq 30$  objectives and target have been achieved; 18-29 fairly achieved; 6-17 partially achieved;  $\leq 5$  not achieved

### 2. Additional input on the following aspects:

<p><b>1. Relevance</b> Objectives of the project are still valid with respect to the current situation</p> <p><b>2. Impact</b> 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</p> <p><b>3. Sustainability</b> Benefits of the project could be sustained after project ends and funding ceases</p> <p><b>4. Others</b></p>
--



**GUIDELINES ON THE COST SHARING POLICY FOR  
THE OPERATION OF THE M.V. SEAFDEC 2**  
*(Revised after comments from the 37<sup>th</sup> PCM)*

**I. Introduction**

With favorable understanding of the Government of Japan about the function of SEAFDEC to assist in the sustainable development of fisheries of the Member Countries, the Government of Japan agreed to provide a new research vessel, the M.V. SEAFDEC 2 under the Japanese Grant Aid Program to SEAFDEC.

Through a series of consultations with the Government of Japan, SEAFDEC and Japan reached to the agreement that the utilization of the M.V. SEAFDEC 2 should be secured for the benefit of the countries which are eligible to the Japanese Grant Aid Program. On the other hand, it was also agreed among the SEAFDEC Member Countries that the operation of the M.V. SEAFDEC 2 should be based on cost-sharing policy taking into account both aspects, such as the benefits of the operation of the vessel to the Member Countries and the expected budgetary constraints of SEAFDEC in the future. The cost-sharing policy regarding the operation of the M.V. SEAFDEC 2 has also been recognized as an important element to establish the ownership of research activities by the Member Countries and to promote sustainable research activities using the M.V. SEAFDEC 2 in the region.

In exploring the research needs of the Member Countries, SEAFDEC established two mechanisms, namely: the Eligible Countries Committee where the eligible countries<sup>1</sup> could provide or propose their own research needs or plans for the use of the M.V. SEAFDEC 2; and the Operations Committee where the annual plan of operation of the M.V. SEAFDEC 2 would be developed taking into account of needs of the SEAFDEC Member Countries other than the eligible countries as well.

During the 26<sup>th</sup> Meeting of the SEAFDEC Program Committee held in Manila in 2004, three categories of the expected operation using the M.V. SEAFDEC 2 were presented. It was also recommended that all categories of collaborative operations that are related to the needs of the Member Countries and operation in the national waters would be under the cost-sharing policy except the operation by SEAFDEC to verify the application of standardized research methods using the M.V. SEAFDEC 2, which have been considered through the Technical Consultative Meeting in October 2003 and November 2004.

At the 45<sup>th</sup> Meeting of the Council of SEAFDEC held in Cebu of the Philippines in 2013, SEAFDEC/TD proposed revision of the Guidelines on the cost sharing policy for operation of the M.V. SEAFDEC 2 particularly on the proposed modification of the cost-sharing policy for countries requesting for the use of the M.V. SEAFDEC 2, the Council expressed apprehension that the Member Countries might not be able to shoulder the increased costs as proposed by SEAFDEC considering the difficulties in the internal negotiations with the respective national budget agencies of the countries.

However, with regards to data sharing, the Council agreed that some basic data collected onboard during the survey should be shared with SEAFDEC/TD. The data to be shared should be finalized at the planning meeting of 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. (appears as a new para 4 of the Part IV in this document).

The proposed of 3<sup>rd</sup> revision is prepared in response to the recommendations made by the SEAFDEC Council at its 46<sup>th</sup> Meeting. The Council agreed in principle that whenever requests of Member Countries to use the vessel for a total period that required higher operation costs than the budget allocated through the MRC (*e.g.* 60 days), the additional operation costs would be shouldered by requesting countries. The Council also suggested that priority for the utilization of the vessel should be accorded to collaborative resources surveys involving more than one Member Country, and to requests from countries that do not have their own research vessels.

---

<sup>1</sup> Including Cambodia, Indonesia, Myanmar, Philippine, and Vietnam



## II. Objectives

This Guideline will provide the outline of the expected cost-sharing policy to be considered by the Member Countries, for the operation of the M.V. SEAFDEC 2 based on the policy arrived at SEAFDEC in early March 2004.

## III. Outline of the Proposed Cost-Sharing Policy

Regardless of whether it is in cash or in kind, the following financial items related to the operations cost should be borne as a matter of principle, by the Member Country requesting for the collaborative operation of the M.V. SEAFDEC 2 in her national waters in response to her needs and interests.

- 1) **Supply of fuel** for the entire duration of the research including cruising to and back to the requesting country<sup>2</sup>;
- 2) **Supply of fresh water** that would be consumed by the vessel during the operation of research in the national waters;
- 3) **Salary and necessary DSA of the local or national participants** onboard, who are involved in the research activities should be borne by the Member Country based on its own national standard;
- 4) **Agency fee and port clearance fee and other expenditures** *i.e.* Port fee, tug fee, pilot fee, fury boat fee (if necessary), custom and immigration fee and other fee concerns according to the national regulation should be borne by the Member Country when the vessel visits and stays at the port for implementation of the collaborative research program; and
- 5) **Additional operation costs**, *i.e.* food and sea allowance of crews and TD staff on-board the M.V. SEAFDEC 2 and other expenditures occurred from research activities on board *i.e.* fish baits, materials and supplies. This applies only when the estimated operation costs based on the vessel operation plan exceed the allocated annual MRC budget. In the case where there are more than one country propose to use the vessel, additional operation costs should be shared by all countries, and calculated according to the number of days on-board the cruise of the respective countries.

## IV. Working Scheme for the Collaborative Research with the Member Countries

- 1) Each Member Country is requested to prepare her research proposal, if any, taking into account of the short or medium-term activities. The proposal should be presented to the Eligible Countries Committee and/or Operations Committee to consider the cruise plans for the M.V. SEAFDEC 2. As a matter of principle, the staying period for the operation of the M.V. SEAFDEC 2 in the national waters could be limited to **one month or more**, taking into account of the availability also of the M.V. SEAFDEC 2 for the other Member Countries;
- 2) Through consultation with the Operations Committee, each proposal from the Member Countries and Departments should be reviewed and finalized based on priority, practicability, readiness and financial background of the proposed research programs. The schedule of the research program of the country finalized by the Operations Committee could be adjusted to cater to the next priority country's needs or could be postponed until financial arrangements become ready by the requesting country;
- 3) Two months prior to the implementation of the individual research program, TD staff in charge of the operation will communicate through E-mail/or visit each beneficiary Member Country to discuss with the concerned staff on the detailed arrangements of the cruise and research program. The concerned members of the Regional Fisheries Policy Network (RFPN) could be mobilized for effective communication with their respective countries, as the case may be;

---

<sup>2</sup> As amended by the SEAFDEC Council at its 41<sup>st</sup> Meeting in 2009

4) With regards to data sharing, Member Country agreed that the **basic data**<sup>3</sup> collected onboard during the survey should be shared with SEAFDEC/TD. The data to be shared should be finalized at the planning meeting of 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<sup>4</sup>; and

5) Preliminary cruise report including comments on the immediate impacts of the utilization of the M.V. SEAFDEC 2 as well as the results of the national research program should be submitted to SEAFDEC/TD within six months after the cruise.

- |   |
|---|
| 6) Priority to use the vessel should be given to the following:<br>i. Collaborative survey involving more than one Member Country;<br>ii. Eligible Member Countries;<br>iii. Member Countries that do not have national research vessel;<br>iv. Other Member Countries. |
|---|

---

<sup>3</sup> Basic data refers to any types of data from scientific instruments such as current data, ictd or ctd data, sea surface temperature data, etc., including navigation and fishing logsheet. (insertion based on the comment made at 37<sup>th</sup> PCM in 2014)

<sup>4</sup> As amended by the Council at its 45<sup>th</sup> Meeting in 2013



## **GUIDELINES FOR CHARTERING/RENTING OF M.V. SEAFDEC 2**

*(Revised after comments from the 37<sup>th</sup> PCM)*

### **I. Background**

The research vessel M.V. SEAFDEC 2 was granted by the Government of Japan to SEAFDEC under the Japanese Grant Aid Program. While it was agreed that the utilization of the M.V. SEAFDEC 2 should be secured for the benefit of the countries, particularly those that are eligible to the Japanese Grant Aid Program<sup>1</sup>, the annual plan of operation of the M.V. SEAFDEC 2 had been developed taking into account the needs of all SEAFDEC Member Countries, and the operation of the vessel had been undertaken under the **cost-sharing policy** as agreed upon by the SEAFDEC Council.

Nevertheless the utilization of the M.V. SEAFDEC 2 by the Member Countries has been drastically reduced since 2007, and the concerns on less utilization of the vessel was expressed by the SEAFDEC Council over the years. To enhance future utilization of the vessel, SEAFDEC was requested during the Special Meeting of the SEAFDEC Council (3-4 October 2013) to “explore other types of systems/sources of funds to cover the cost of M.V. SEAFDEC 2 in the future”. Subsequently during the 46<sup>th</sup> Meeting of the SEAFDEC Council (1-4 April 2014), the Council further agreed in principle “to allow national agencies of the Member Countries to charter the M.V. SEAFDEC 2 with approval by the respective Member Country, and requested the SEAFDEC Secretariat to develop draft guidelines for chartering or renting out the M.V. SEAFDEC 2, including the criteria for utilization and the corresponding charges and expenditures”, for the consideration and comments by the 37<sup>th</sup> Meeting of SEAFDEC Program Committee and later consideration and endorsement by the 47<sup>th</sup> Meeting of the SEAFDEC Council in 2015.

### **II. Objectives**

This Guideline provides the outline for the charter/renting of the M.V. SEAFDEC 2 to requesting national agencies (other than fisheries authority) of the SEAFDEC Member Countries.

### **III. Criteria for Chartering/Renting of the M.V. SEAFDEC 2**

To enhance the utilization of the M.V. SEAFDEC 2, while maintaining the benefits that could be gained from the vessels to the Member Countries of SEAFDEC, following criteria should apply for chartering/renting of the vessel:

- i. Chartering/renting of the M.V. SEAFDEC 2 should be allowed for other agencies of the Member Countries for the conduct of marine research survey in the national waters, provided that this is agreed upon by fisheries authority of the respective Member Country.
- ii. Duration for chartering/renting of the M.V. SEAFDEC 2 should not overlap/conflict with those of research surveys proposed by the fisheries authorities of the Member Countries.

### **IV. Financial Scheme for the Chartering/Renting of the M.V. SEAFDEC 2**

Agency requesting to charter/rent the M.V. SEAFDEC 2 should be responsible for all costs related to the operation of the vessel, as follows:

- 1) **Cost of fuel** for the entire duration of the cruise including cruising from and back to the port of the SEAFDEC/TD;
- 2) **Cost of fresh water** that would be consumed by the vessel during the cruise;
- 3) **Salary, DSA and food allowance of all people** onboard, who are involved in the research activities;

---

<sup>1</sup> Including Cambodia, Indonesia, Myanmar, Philippine, and Vietnam

- 4) **Ship agency fee and port clearance fee**, including custom and immigration fee and all concern costs when the vessel visits and stays at the port of country according to the survey plan;
- 5) **Costs of vessel maintenance include** spare parts during the charter/renting period;
- 6) **Average of cost of docking of the M.V.SEAFDEC 2**;
- 7) **Ship and personnel insurance** during charter or renting period;
- 8) **Miscellaneous expenditure in the cruise such as sanitary matter, lubrication oil, etc.;** and
- 9) **Agency cost** at least 15% of total expenditure according to the status of the national agency.

Agency requesting to charter/rent the M.V.SEAFDEC 2 is requested to deposit the amount equal to estimated costs as agreed upon by SEAFDEC/TD and the agency to the bank account of SEAFDEC/TD at least 2 weeks before the embarkation of the vessel from the port of SEAFDEC/TD, except for item no. 1, 2 and 4 which national agency may be responsible for arrangement of those items during the cruise.

#### **V. Working Scheme for Chartering/Renting M.V. SEAFDEC 2**

- 1) Agency requesting to charter/rent the M.V.SEAFDEC 2 should submit the proposal including the project details and survey plan to SEAFDEC/TD through the national fisheries authority of country.
- 2) The proposal should be submitted to SEAFDEC/TD at least 2 months in advance to the survey.
- 3) SEAFDEC/TD would consider the proposal. If the proposed survey overlaps/conflicts with the cruise requested by national fisheries authority of the Member Countries, priority would be given to the fisheries authority.
- 4) SEAFDEC/TD would consider the scope of the survey; while SEAFDEC/TD staffs that are in-charge of the operation would communicate with the requesting agency to discuss on the detailed arrangements of the cruise and research program.
- 5) SEAFDEC/TD would inform all SEAFDEC Member Countries once SEAFDEC accepts the plan for chartering/renting out of the M.V.SEAFDEC 2.
- 6) Written the agreement should be prepared/signed between SEAFDEC and the agency requesting to charter/rent the M.V.SEAFDEC 2;
- 7) For chartering/renting of the M.V.SEAFDEC 2 for operation beyond national jurisdictions of Member Countries, approval should be sought from the SEAFDEC Council (by ad referendum).
- 8) Some basic data<sup>2</sup> collected during the survey would be shared with SEAFDEC/TD. The data to be shared should be agreed upon between the requesting agency and SEAFDEC/TD. Such basic data will be kept confidential and used only for the SEAFDEC regional database and for future regional analysis.

---

<sup>2</sup> Basic data refers to the 3<sup>rd</sup> Revision of Cost-Sharing Policy for the Operation of the M.V.SEAFDEC 2

## CLOSING REMARKS

*By Dr. Chumnarn Pongsri,*  
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 a very long three-day deliberation on the SEAFDEC programs and important issues, we have come to the end of the Thirty-seventh 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, insights, and suggestions on the various aspects that we have discussed, and for your other contributions that make this Meeting achieve its objectives. I would also like to thank our staff from the Training Department and the Secretariat for diligently working behind the scene to make this Meeting successful.

As I mentioned in my Opening Remarks, your valuable inputs and recommendations that went into the draft Meeting Report, which we have adopted at this Meeting would be presented to the two-day 17<sup>th</sup> Meeting of the FCG/ASSP starting tomorrow, and to the forthcoming Meeting of the SEAFDEC Council as appropriate, for final endorsement. We are therefore very thankful to all of you for providing valuable inputs during our three-day discussion, for the improvement of the SEAFDEC programs and activities, as well as recommendations and comments with regards to the appropriateness and effectiveness of our program implementation with respect to the needs and requirements of the Member Countries. Once again, we extend our heartfelt gratitude to all of you.

Finally, for some of you who will leave this beautiful city before the FCG/ASSP Meeting, I wish you safe journey back to your homes. For the others, I will see you during the FCG/ASSP Meeting which will be held from tomorrow until Friday. Finally, I wish you all the best and every success in the challenges entrusted on us. With that Ladies and Gentlemen, I now declare the Thirty-seventh Meeting of the Program Committee closed.

Thank you.