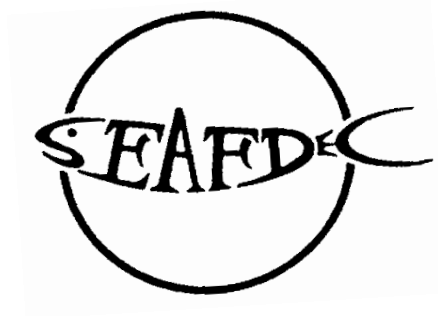


**REPORT OF
THE THIRTY-FIFTH MEETING OF THE PROGRAM COMMITTEE
OF THE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

**Chiang Mai, Thailand
26-28 November 2012**



**THE SECRETARIAT
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

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EXECUTIVE SUMMARY

The Thirty-fifth Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Chiang Mai, Thailand from 26 to 28 November 2012 and hosted by the Marine Fisheries Research Department (MFRD). The Meeting reviewed the SEAFDEC programs implemented in 2012 and scrutinized the programs to be implemented in 2013, in order to ensure that these are formulated and implemented in line with the priorities and needs of the Member Countries. The Meeting was chaired by the Secretary-General of SEAFDEC in his capacity as the Chairperson of SEAFDEC Program Committee.

This year's review of the implementation of the SEAFDEC programs, started with the Programs under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism followed by Departmental Programs, Other Programs, and Pipeline Programs. Specifically, the Programs under the FCG/ASSP Mechanism have been grouped accordingly under the Program Thrusts of the SEAFDEC Program Framework, which was adopted by the SEAFDEC Council in 2009.

The Meeting took note of the 35 programs implemented by SEAFDEC in 2012, which has been classified into: 25 programs under the FCG/ASSP Mechanism; nine Departmental Programs; and one Other Program. Subsequently, the Meeting took note of the 30 programs proposed to be implemented in 2013, comprising 22 programs under the FCG/ASSP Mechanism and eight Departmental Programs.

Specifically for programs under the FCG/ASSP Mechanism, the Program Committee endorsed the 22 programs for the Year 2013, which comprise 16 programs that are continuing from 2012 and six new programs. The Program Committee also sought the assistance of SEAFDEC with regards to the following programs:

- 1. Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)**
 - i) Philippines requested that the Training Department (TD) explore the possibility of continuing the study on optimum light intensity and maximum wattage of light used for different fishing gear that target pelagic fishes such as purse seines, etc.
 - ii) Thailand expressed the willingness of the country to join in the future studies on light fishing to facilitate dissemination of the results to fishers in Thailand.
 - iii) Malaysia suggested TD to organize a technical workshop to share the results of the implementation of activities from this project among the Member Countries.

- 2. Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement**
 - i) Vietnam requested TD to provide technical assistance and advice to coastal communities in monitoring/diagnosis of fishing grounds, considering that activities on fish *refugia* have been undertaken in eight provinces of Vietnam.
 - ii) Myanmar requested that information derived from this project be extended to Myanmar.
 - iii) Lao PDR requested TD to consider extending activities on mobile hatchery to also include nursery stage in order to improve the survival rate of fish after release in inland waters.
 - iv) Malaysia requested TD to share the information on the design and management of FEDs to enhance the tuna resources in the waters of Sabah, Malaysia.
 - v) Philippines requested the assistance of Japan for the rehabilitation of habitats including breeding of commercially-important marine species for the restoration of the country's degraded natural resources.

- 3. Human Resources Development (HRD) Programs on Fisheries Management Approaches for Sustainable Fisheries**
 - i) Vietnam expressed the willingness to participate in this regional project in 2013 under a cost-sharing scheme, to support the implementation of Monitoring, Control and Surveillance (MCS) in the coastal areas of Vietnam.
 - ii) Malaysia and Myanmar expressed their support to this project and requested for the conduct of on-site trainings in their respective countries in 2013.

- 4. Strategies for Trawl Fisheries By-catch Management (REBYC-II CTD)**
 - i) Myanmar expressed the willingness of the country to participate in the project activities on by-catch management and reduction of discards in trawl fisheries as well as in the Regional Training-cum-Workshop on Co-management to be conducted in July 2013.
- 5. Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release**
 - ii) Thailand sought the possibility for SEAFDEC to conduct resource enhancement activities in the Andaman Sea.
 - iii) Malaysia requested that this project be extended to other aquatic species such as lobsters if financial resource is available.
- 6. Promotion of Sustainable and Region-oriented Aquaculture Practices**
 - i) Myanmar requested SEAFDEC for technical assistance in addressing a problem on mass mortalities of paddy eels due to viral diseases that cause red spot on their skin.
- 7. Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia**
 - i) Vietnam requested the Aquaculture Department (AQD) to compile information on activities related to monitoring and surveillance of diseases undertaken by the other Member Countries and that such information should be shared among the Member Countries.
 - ii) Thailand suggested that this project should support the establishment of a network among the countries in the region in the monitoring and surveillance of aquaculture diseases. However, this should be brought up with the Network of Aquaculture Centres in Asia-Pacific (NACA), which has been playing the leading role on disease surveillance with AQD serving as its Lead Centre for the region.
 - iii) Malaysia commented that AQD could consider conducting surveillance and training on fish-borne zoonotic parasites preferably in 2013; and requested AQD to consider assisting Malaysia in the surveillance of diseases and to determine the prevalence of diseases as well as conduct training on Epizootic Ulcerative Syndrome (EUS) for freshwater and marine fishes, Viral Nervous Necrosis (VNN) disease for marine fish, and other marine shrimp-listed diseases such as Early Mortality Syndrome (EMS) in shrimps.
- 8. Food Safety of Aquaculture Products in Southeast Asia**
 - i) Singapore requested AQD to consider including sea bass as priority species under this project in 2013.
 - ii) Thailand requested to include giant freshwater prawn (*Macrobrachium rosenbergii*) and white shrimp (*Penaeus vannamei*) under this project.
- 9. Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea**
 - i) Vietnam commended the conduct of the activities under this project especially on the establishment of cooperation in fisheries management at the sub-regional level and requested for the possibility of expanding the project to the South China Sea area, and that this project could be undertaken in collaboration with the upcoming UNEP-GEF SCS Project on fish *refugia*.
 - ii) Malaysia suggested SEAFDEC to consider conducting a study to evaluate the impact of climate change in key marine habitats and on aquaculture species, and the results of such study should be shared with countries in the region. Malaysia also suggested that the activities to be undertaken under this project should not only focus on the conduct of meetings, consultations and on-site trainings, but also include the conduct of specific technical projects.
 - iii) Cambodia expressed the appreciation to Sida for supporting the implementation of this project in the Gulf of Thailand in 2013-2017, and requested that information on the financial aspects be made available to the participating countries, to enable the countries to prepare their respective counterpart budget for the implementation of the activities under a cost-sharing mechanism.

- 10. Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management**
 - i) Vietnam requested SEAFDEC to provide technical assistance in the area of capacity building on co-management and rights-based fisheries management; and expressed the willingness to participate in this project under a cost-sharing basis.
 - ii) Cambodia suggested that the project should come up with recommendations to develop legal framework for supporting fishery communities in the participating countries to ensure the sustainable of the activities after the project completion.
 - iii) Myanmar requested for the extension of the activity to cover co-management in small- and medium-fishery communities in Myanmar.

- 11. Promotion of Fishing Licensing, Boats Registration and Port State Measures**
 - i) The Food and Agriculture Organization of the United Nations (FAO) expressed their support to the development of a regional fishing vessels record for Southeast Asia.
 - ii) Cambodia suggested that the Southeast Asian countries could consider the development of regional guidelines to implement in Southeast Asia.

- 12. Fisheries Resource Survey and Operational Plan for the M.V. SEAFDEC 2**
 - i) Vietnam requested to reserve the M.V. SEAFDEC 2 for the conduct of population dynamics survey of pelagic fishery resources in Vietnam waters in 2013.
 - ii) Thailand requested SEAFDEC to consider organizing a training course on resource survey to enhance the capacity for the Fishery Biologists of the Department of Fisheries of Thailand.

- 13. Deep Sea Fisheries Resources Exploration in Southeast Asia**
 - i) Indonesia requested TD to continue the production of information on deep-sea fisheries resources, *i.e.* specimens, guidebooks, posters, and leaflets, in layman's language, and to come up with sets of recommendations for future development of deep-sea fisheries in Southeast Asia.
 - ii) Philippines requested TD to provide technical assistance for enhancing the capacity of BFAR staff on fish larvae identification specifically on tuna, sardines and other pelagic species.
 - iii) Thailand also requested TD to consider conducting training on deep-sea fisheries resources exploration and fisheries resource survey.

- 14. Development of Regional Database for Fishery Management**
 - i) Brunei Darussalam requested to be updated on the final revised schedule of the training in December 2012.
 - ii) Myanmar reiterated that the training on the use of fish bio software for data collectors will go on as planned in January 2013 in Yangon, Myanmar.
 - iii) Indonesia requested SEAFDEC to continue sharing the information compiled through the regional database to the Member Countries.

- 15. Tagging Program for Economically-important Pelagic Species in the South China Sea and Andaman Sea**
 - i) The Marine Fishery Resources Development and Management Department (MFRDMD) was requested to provide the countries with tags that are still available so that the activity could still be pursued by the countries through their respective national activities after the end of this project.

- 16. Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters**
 - i) Philippines suggested TD to consider possibility to disseminate the results from activity on interaction of sea turtles and fishery to the Member Countries by the end of 2012.

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

- i) Malaysia suggested that SEAFDEC should explore the possibility of being invited to attend the Senior Officials Meeting of the ASEAN Ministers on Agriculture and Forestry (SOM-AMAF) as several fisheries-related issues are discussed during such Meetings.

For the six new programs proposed under the FCG/ASSP Mechanism starting from 2013, namely: 1) Offshore Fisheries Resources Exploration in Southeast Asia; 2) Optimizing Energy Use and Improving Safety of Fishing Activities; 3) Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in the Southeast Asian Region; 4) Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products; 5) Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region; and 6) Research and Management of Sharks and Rays in the Southeast Asian Waters, the Program Committee provided suggestions on specific programs as follows:

1. Optimizing Energy Use and Improving Safety of Fishing Activities

- i) TD was requested to consider including students and trainers from the National Agriculture Training Council (NATC) of Malaysia in the activities to be conducted onboard fishing vessels in Malaysian waters.
- ii) Thailand requested TD to pursue activities on alternative fuel especially with respect to the small-scale fisheries.
- iii) Philippines suggested the project to make use of the new agreement on fishing vessel safety, known as the Cape Town Agreement of 2012 on the Implementation of the Provisions of the 1993 Protocol Relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, as reference for the implementation of this project.

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

- i) Vietnam suggested TD to consider conducting the relevant project activities to support the Member Countries, also considering that Vietnam would upgrade its fisheries database starting in 2013 in accordance with international and regional requirements.

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

- i) Philippines suggested that the activities should consider purse seine fishing operations and their fishing ground; and also consider comparing the applicability on the use of total allowable catch (TAC) from tropical countries, where target species include *Rastrelliger* spp. and scads, with the TACs from those of the temperate countries.

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

- i) Indonesia suggested that sharks specimens from Indonesian water which were previously collected and preserved, should also be used for analysis.

The Program Committee also endorsed the Departmental Programs proposed for 2013 which comprise eight continuing programs from 2012, three of which would be implemented by TD, namely: 1) Tailor-made Training Programs; 2) Promotion and Enhancement Fisheries Information; and 3) Improvement of Fisheries Technology and Reduction of the Impact from Fishing; and five 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 made the following comments specifically for the program on:

1. Improvement of Fisheries Technology and Reduction of the Impact from Fishing:

- i) Lao PDR requested TD to consider extending support to conclude activities on data collection on freshwater fishing gears and methods in Lao PDR as the previous activities on this had not been completed.

- ii) Philippines suggested that the terminology on “destructive fishing gears and practices” might be changed to a more appropriate terminology.

The Program Committee took note of the existing four pipeline projects which are still under discussion and negotiation with potential donor agencies, namely: 1) Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management; 2) Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand; 3) Improving Methodologies and Capacity for the Collection of Capture Fishery Statistics in the Southeast Asian Region; and 4) Fisheries Resources Management on Important Pelagic Species for Sustainable Fisheries in the Sulu-Sulawesi Sea, and made the following comments:

- 1. Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management**
 - i) Malaysia prefers to wait for updated information on the status of the approval of the project; and if the project involves soft loan term, Malaysia may reconsider its involvement in the project.
- 2. Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand**
 - i) All participant countries should submit their respective endorsement letter by the end of December 2012 or January 2013.
- 3. Improving Methodologies and Capacity for the Collection of Capture Fishery Statistics in the Southeast Asian Region**
 - i) The five-year project had been proposed for funding support by the Asian Development Bank (ADB) but there has been no feedback from ADB until now.
- 4. Fisheries Resources Management on Important Pelagic Species for Sustainable Fisheries in the Sulu-Sulawesi Sea**
 - i) This five-year project has been proposed for funding support by the ADB, but there has been no feedback from ADB until now.
 - ii) Malaysia expressed support to this proposal and offered to host the inception meeting of the project in Sabah, Malaysia.

The Program Committee suggested that in the formulation of future programs, efforts should be made to avoid repetition of activities as well as possible revival of already completed activities and also suggested that project titles should be more specific to reflect the actual scope of the projects and that the objectives should conform to the scope of the projects.

In response to the query on the availability of a mechanism within SEAFDEC for adjustments of projects in the course of their implementation to accommodate the requirements of the Member Countries, it was explained that this issue would be raised for discussion by the Third SEAFDEC Review Committee. It was also clarified that the current planning process could be adjusted to enable the Member Countries to take part in the formulation of the projects and activities, and that the project proposals could be discussed with donors prior to submission to the Program Committee. In addition, the level of the total Minimum Regular Contribution (MRC) to SEAFDEC should also allow SEAFDEC to accommodate emerging issues as requested by the Member Countries.

The Program Committee took note of the cooperation with non-member governments and international/regional organizations, *i.e.* the Bay of Bengal Programme-Intergovernmental Organization (BOBP-IGO), the Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific (FAO/RAP), and the United States Agency for International Development/Regional Development Mission for Asia (USAID Asia).

The Program Committee was informed that the the Fisheries Agency of Japan planned to provide the Trust Fund VI to SEAFDEC, for the year 2013 and onward, in order to support the sustainable development of fisheries in the region.

The Program Committee also took note that SEAFDEC Secretariat is planning to co-organize the Inter-governmental Forum on Live Reef Food Fish Trade, tentatively scheduled from 31 January 2013 to 1 February 2013, in collaboration with the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) and with funding support from the USAID-Asia. In addition, a workshop on Fish Passage would also be conducted in Khon Kaen Province, Thailand on 17-21 March 2013, with financial support from FAO and other sources that would be further explored.

On the Draft Guidelines for the establishment of SEAFDEC Collaborating Centres, the Program Committee supported in principle the Draft Guidelines. The Committee also requested SEAFDEC Secretariat to accommodate comments made by the Committee on the specific paragraphs of the Guidelines and come up with a revised Draft for circulation to the National Coordinators before submission to the SEAFDEC Council for consideration.

The Program Committee adopted the Report of the 35th Meeting of the SEAFDEC Program Committee to be further submitted to the 45th Meeting of SEAFDEC Council and to ASEAN through the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) for consideration.

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LIST OF ACRONYMS

AEG-CITES	ASEAN Experts Group on CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)
AMAF	ASEAN Ministers on Agriculture and Forestry
APFIC	Asia Pacific Fisheries Commission
AQD	SEAFDEC Aquaculture Department
ASEAN	Association of Southeast Asian Nations
ASSP	ASEAN-SEAFDEC Strategic Partnership
ASWGF	ASEAN Sectoral Working Group on Fisheries
BOBLME	Bay of Bengal Large Marine Ecosystem
CCRF	Code of Conduct for Responsible Fisheries
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COFI	Committee on Fisheries
CTI-CFF	Coral Triangle Initiative – Coral Reefs, Fisheries and Food Security
DOF	Department of Fisheries
FAO	Food and Agriculture Organization of the United Nations
FCG	ASEAN-SEAFDEC Fisheries Consultative Group
GEF	Global Environmental Facility
JTED	Juvenile and Trash Excluder Device
LRFFT	Live Reef Food Fish Trade
MFRD	SEAFDEC Marine Fisheries Research Department
MFRDMD	SEAFDEC Marine Fishery Resources Development and Management Department
MRC	Mekong River Commission
MRC	Minimum Regular Contribution to SEAFDEC
NACA	Network of Aquaculture Centres in Asia-Pacific
PCM	SEAFDEC Program Committee Meeting
RCCRF	Regionalization of the Code of Conduct for Responsible Fisheries in Southeast Asia
RFPN	Regional Fisheries Policy Network
RTC	Regional Technical Consultation
SEAFDEC	Southeast Asian Fisheries Development Center
Sida	Swedish International Development Cooperation Agency
SOM-AMAF	Senior Officials Meeting of the ASEAN Ministers on Agriculture and Forestry
TD	SEAFDEC Training Department
TED	Turtle Excluder Device
UNEP	United Nations Environmental Programme

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

**Chiang Mai, Thailand
26-28 November 2012**

I. INTRODUCTION

1. The Thirty-fifth Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Chiang Mai, Thailand from 26 to 28 November 2012 and hosted by the Marine Fisheries Research Department (MFRD).

2. The Program Committee Meeting was attended by the SEAFDEC Program Committee Members for Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam together with their respective delegations as well as representatives from collaborating partners namely: the Bay of Bengal Programme–Intergovernmental Organization (BOBP-IGO), FAO Regional Office for Asia and the Pacific (FAO/RAP), National Agriculture Training Council (NATC) of the Ministry of Agriculture and Industry of Malaysia, and the USAID Regional Development Mission for Asia. 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 list of participants, observers, and SEAFDEC officers, appears as **Annex 1**.

II. OPENING OF THE MEETING

3. The Chief of SEAFDEC/MFRD, *Mr. Yeap Soon Eong* welcomed the participants to the Meeting. On behalf of MFRD as host of the Program Committee Meeting, he thanked the SEAFDEC Secretariat for the excellent arrangements of the Meeting held in Chiang Mai, Thailand instead of in Singapore. Finally, he expressed the wish for the successful deliberations in order that the Meeting would come up with fruitful recommendations.

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 stated that for this year the order of the review of implementation of the SEAFDEC programs had been changed to start with the Programs under the FCG/ASSP Mechanism followed by Departmental Programs and other programs, and pipeline programs. He also pointed out that the Programs under the FCG/ASSP Mechanism have been grouped accordingly under the Program Thrusts of the SEAFDEC Program Framework. He also informed the Program Committee about a special session of the Meeting which would aim to solicit the consideration of the Program Committee on the Draft Guidelines for the Establishment of SEAFDEC Collaborating Centres. After asking the Program Committee to closely scrutinize the proposed programs of activity for improvement to ensure that these are suitable for the requirements of the region, he declared the Program Committee Meeting open. His Opening Remarks appears as **Annex 2**.

III. ADOPTION OF THE AGENDA AND ARRANGEMENTS OF THE MEETING

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

IV. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2012 AND PROPOSED PROGRAMS FOR THE YEAR 2013

6. The Program Committee was informed that the projects under the FCG/ASSP Mechanism have been categorized based on the SEAFDEC Program Thrusts endorsed by the SEAFDEC Council during its 41st Meeting in 2009.



4.1 Programs under the FCG/ASSP Mechanism

7. The Program Committee noted the progress and achievements by the Secretariat and the Departments in the implementation of the various projects in 2012, as well as the activities proposed for 2013 (**Annex 4**). The Program Committee provided recommendations for the improvement of the projects and activities as follows:

4.1.1 Existing Programs

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

(1) Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)

8. The Committee Member for Vietnam inquired whether TD has undertaken a study on the application of TEDs and JTEDs by fishers in the Member Countries. In response, it was clarified that TD conducted evaluation/assessment of the use of TEDs and JTEDs through questionnaires sent to the Member Countries of which the results showed that policy makers and fishers understood the usefulness of the devices as means of excluding juveniles from the catch. In addition, the Program Committee was informed that this project has linkage with the FAO/UNEP/GEF Project on Reduction of Environmental Impact from Tropical Shrimp Trawling through the Introduction of By-catch Reduction Technologies and Change of Management (REBYC).

9. The Committee Member for the Philippines commended TD for conducting activities on the experiments and demonstration on the use of TEDs and JTEDs in the region as the results of these activities had been used specifically in the Philippines as basis for national policy formulation and in conducting dialogues with stakeholders to justify the promotion of the policy.

10. The Committee Member for Myanmar expressed his gratitude to TD for providing assistance to the Department of Fisheries of Myanmar in the planning and implementation of a national study on the Impact of Squid Fishing with Lights on By-catch of Juveniles of Commercially-important Fish Species in Kow Thaug, Myanmar, and looked forward to sharing the results of this study to the other Member Countries.

11. The Committee Member for the Philippines requested TD to explore the possibility of continuing the study on optimum light intensity and maximum wattage of light used for different fishing gear that target pelagic fishes such as purse seiner, etc. In response, TD informed the Program Committee that a study on light fishing such as for squid jigging has been conducted in collaboration with the Philippine Bureau of Fisheries and Aquatic Resources to serve as basis for development of appropriate measures for sustainable fishing operations.

12. The Committee Member for Thailand also supported the request to continue this study and expressed the willingness to join in the future activities and that the results of the study could be extended to the fishers in Thailand.

13. On the use of circle hook, the Committee Member for Malaysia expressed the appreciation to TD for the conduct of fishing trial and demonstration to promote the use of circle hook in bottom long-line in Sabah, Malaysia on 12-16 March 2012, and informed the Program Committee that Malaysia is planning to conduct fishing trials to come up with policy on the promotion of circle hook in the country.

14. TD provided additional information on the results of experiments on the use of circle hook and J-hook in the South China Sea and the Andaman, which indicated that the catch of tuna from the use of J-hook and circle hook is not significantly different. However, circle hooks reduced the amount of by-catch of sharks and sea turtles from long-line fisheries.

15. In this regard, the Committee Member for Malaysia suggested that TD could consider organizing a technical workshop to share the results of the implementation of activities under this project among the Member Countries.

(2) Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses

16. While suggesting for the continuation of this project, the Committee Member for the Philippines expressed the appreciation for the assistance provided by SEAFDEC on the activities onboard the M.V. DA-BFAR, and sought additional assistance of SEAFDEC on fish handling onboard fishing vessels in order to reduce post-harvest losses of tuna due to improper handling.

(3) Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement

17. The Committee Member for Vietnam informed the Program Committee on the fisheries resources surveys in the waters of Vietnam using the M.V. SEAFDEC 2 of which the results of the surveys could be shared with the other Member Countries. She also expressed the interest in participating in this project considering that Vietnam has been undertaking activities on fish *refugia* in eight provinces and requested TD to provide technical assistance and advice to coastal communities in monitoring/diagnosis of fishing grounds. In addition, the Committee Member for Myanmar also supported the program and requested that information derived from this project be extended to Myanmar.

18. The Committee Member for Lao PDR expressed the appreciation for the activities conducted by TD in inland waters especially on mobile hatchery demonstration. However, as mobile hatchery focused only in producing seeds (breeding stage), he requested that activities be extended to include nursing stage in order to improve the survival rate after release.

19. The Committee Member for Malaysia pointed out that several designs of artificial reefs (ARs) have been introduced for resource enhancement and expressed willingness to share the information with other Member Countries. In addition, he requested TD to share the information on the design and management of FEDs to enhance the tuna resources in Sabah waters of Malaysia.

20. Considering the degradation of coastal habitats of the Southeast Asian region, the Committee Member for the Philippines supported the continued implementation of the project and informed the Program Committee on the successful implementation of FEDs in several coastal communities in the Philippines using the design introduced by SEAFDEC. He also requested the assistance of Japan on the rehabilitation of habitats including breeding of commercially-important marine species for the rehabilitation of degraded natural resources.

(4) Human Resources Development (HRD) Programs on Fisheries Management Approaches for Sustainable Fisheries

21. The Committee Member for Vietnam expressed the appreciation to TD for conducting regional training courses particularly on Monitoring, Control and Surveillance (MCS) for Combating Illegal, Unreported and Unregulated (IUU) Fishing in Southeast Asia, and requested that assistance be extended to Vietnam in 2013. Vietnam is willing to participate in this project under the cost-sharing scheme, in order to support the implementation of MCS in the coastal areas of Vietnam.

22. The Committee Members for Malaysia and Myanmar expressed their support to this project and requested for the conduct of on-site trainings in their respective countries in 2013.

23. While noting that there are several projects undertaken by SEAFDEC that address IUU fishing, the Committee Member for Cambodia suggested that these projects should be merged and integrated in order that activities could be undertaken in harmonized manner and benefits to the Member Countries



are maximized. He also reiterated on the need to have clear definition of IUU fishing for the region in order that activities could be formulated and implemented accordingly.

24. The Committee Member for Indonesia commented on the percentage of achievements from this project, *i.e.* 100% for the development of regional recommendation for the needs and requirements for the HRD program for the region. In this regard, such regional recommendation should be shared with the Member Countries, and should also be used by TD as basis for the formulation of future HRD activities.

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

25. The Committee Member for Myanmar informed the Program Committee on the willingness of the country to participate in the project activities on by-catch management and reduction of discards in trawl fisheries as well as in the Regional Training-cum-Workshop on Co-management (including local/community based approaches to responsible fisheries) to be conducted in July 2013.

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

26. The Committee Member for Thailand sought the possibility of conducting resource enhancement in the Andaman Sea under this project, while the Committee Member for Malaysia requested that this project could be extended to other aquatic species such as lobster if financial resource is available.

27. In response to the suggestion of the Committee Member for Indonesia that an evaluation and management of the stock released should be conducted, it was clarified that the stock enhancement activities conducted by AQD focused not only on the release of seeds but also on social awareness by working with local communities in the release sites. In addition, AQD also undertook measures to evaluate the effectiveness of the stock enhancement activities, particularly by developing appropriate markers for released stocks starting with abalone and mud crab. Initial stock enhancement activities were done in a marine protected area where the released stocks are not harvested.

(7) Promotion of Sustainable and Region-oriented Aquaculture Practices

28. The Committee Member for Myanmar informed the Program Committee on the importance of genetic improvement of commercially-important species such as mud crab to sustain this species and also to establish reliable mass production techniques for genetically-improved strains. He added that *Macrobrachium rosenbergii* is one of the commercially-important species of Myanmar aquaculture, and commended AQD for pursuing this program. Moreover, he also appreciated the efforts of AQD to conduct activities on the assessment of the potential use of feed ingredients from plant origin, as well as on the digestibility experiment of feeds for tilapia in freshwater. Since the country has encountered mass mortalities of paddy eel due to viral diseases causing red spot on the skin, he then requested SEAFDEC for technical assistance on this matter.

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

(8) Chemical and Drug Residues in Fish and Fish Products in Southeast Asia “Biotoxin Monitoring in ASEAN”

29. The Program Committee noted that from 2013, the activities of this project would be extended to cover the ASP, AZA and BTX. While expressing the support for the conduct of these activities, the Committee Member for Myanmar informed the Program Committee that his country would actively participate in the forthcoming activities of this project.

30. The Committee Members for the Philippines and Vietnam shared the experiences encountered in exporting shrimps to Japan where some samples were found to contain level of ethoxyquin that exceeds the maximum residue limit (MRL) accepted by Japan (0.01 ppm for shrimp and 1.0 ppm for fish). The

Program Committee also noted that ethoxyquin is being used as antioxidants in fish meals and fish oils which are important ingredients for aquaculture feeds, and thus could not be avoided. In this connection, some possible means of addressing the issue were suggested, *i.e.* by conducting assay of the feeds and feed ingredients, enhancing the capability of the countries on monitoring of ethoxyquin, and the concerned countries to negotiate with Japan to increase the MRL of ethoxyquin.

(9) Traceability Systems for Aquaculture Products in the ASEAN Region

31. The Committee Members for Malaysia and Vietnam recommended that SEAFDEC should develop the Regional Guidelines on the Traceability Systems for Aquaculture. In this regard, the Committee was informed that the project would compile the technical information on existing traceability systems for aquaculture available in the region to serve as basic requirements for the countries that have not yet established their respective traceability systems.

(10) Utilization of Freshwater Fish for Value-added Products

32. The Program Committee was informed that this project was implemented in four participating countries, namely: Lao PDR, Vietnam, Myanmar, and Indonesia and that a mid-term evaluation was conducted to share the information and results of their products development and processing trials as well as shelf life studies to promote product improvement. The Program Committee also noted that MFRD would prepare and publish a handbook on the processing of value-added products developed by each participating country using freshwater fish species and the handbook would be distributed during the End-of-Project Seminar to be organized in 2013 and also to the Member Countries.

(11) Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia

33. While several countries in the region have undertaken surveillance of aquaculture diseases, the Committee Member for Vietnam requested AQD to compile information on activities related to monitoring and surveillance of diseases undertaken by the other Member Countries and that such information should be shared among the Member Countries. In addition, since aquaculture activities of the region have remarkably been intensified, the Committee Member for Thailand commented that monitoring and surveillance of aquaculture diseases become very important, and suggested that this project could support the establishment of a network among countries in the region. In response, the SEAFDEC Secretary-General informed the Program Committee that the Network of Aquaculture Centres in Asia-Pacific (NACA) has been playing the leading role on disease surveillance where AQD serves as its Lead Centre for the region.

34. The Committee Member for Malaysia commented that AQD could consider conducting surveillance and training on fish-borne zoonotic parasites preferably in 2013. In addition, AQD was also requested to consider assisting Malaysia in the surveillance of diseases and to determine the prevalence of diseases as well as conduct training on Epizootic Ulcerative Syndrome (EUS) for freshwater and marine fishes, Viral Nervous Necrosis (VNN) disease for marine fish, and other marine shrimp-listed diseases such as Early Mortality Syndrome (EMS) in shrimp.

(12) Food Safety of Aquaculture Products in Southeast Asia

35. The Committee Member for Singapore requested AQD to consider including sea bass as priority species under this project in 2013, while Thailand requested to include giant freshwater prawn (*M. rosenbergii*) and white shrimp (*Penaeus vannamei*) under this project.



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

(13) Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea

36. The Committee Member from Vietnam commended the conduct of the activities under this project especially on the establishment of cooperation in fisheries management at the sub-regional level and requested for the possibility of expanding the project to the South China Sea area. In this regard, this project could be undertaken in collaboration with the upcoming UNEP-GEF South China Sea (SCS) Project on fish *refugia*. However, it was also clarified that some activities under this project have already been undertaken in the Gulf of Thailand with the involvement of representatives from Vietnam during the Phase I of the UNEP-GEF SCS Project.

37. In addition, the Program Committee was informed that the next phase of the project which had been proposed for funding from Sida would be implemented in several sub-regions in collaboration with relevant organizations, *e.g.* the Lower Mekong Basin in collaboration with Mekong River Commission (MRC), the South China Sea in collaboration with UNEP-GEF, the Sulu-Sulawesi Sea in collaboration with Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) Project, and in the Andaman Sea in collaboration with the Bay of Bengal Large Marine Ecosystem (BOBLME) Project. Moreover, the Program Committee was also informed that funding to this project is still in the process of discussion.

38. The Committee Member for Malaysia suggested that SEAFDEC could consider conducting a study to evaluate the impact of climate change in key marine habitats, *e.g.* coral reefs and on major aquaculture species to be conducted on a pilot scale. He also recommended that the evaluation may need to be done on a time series basis and that results of the study should be shared with the countries in the region.

39. The Committee Member for Cambodia expressed his appreciation to Sida for supporting the implementation of this project in the Gulf of Thailand in 2013-2017, and requested that information on the financial aspects be made available to the participating countries, to enable the countries to prepare their respective counterpart budget for the implementation of the activities under a cost-sharing mechanism.

40. The Committee Member for Malaysia also suggested that the activities to be undertaken under this project should not only focus on the conduct of meetings, consultations, and on-site trainings but also on the conduct of specific technical projects.

(14) Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management

41. The Committee Member for Vietnam informed the Program Committee that Vietnam has issued a new Decree, which includes the regulations for zoning of areas for marine and coastal fisheries management. Emphasizing on right-based fisheries management, Vietnam has planned to develop 140 demonstration sites under the World Bank Project. In this connection, SEAFDEC was requested to provide technical assistance in the area of capacity building on co-management and rights-based fisheries management. Vietnam is willing to participate in this project under a cost-sharing basis.

42. While expressing the view on the establishment of fishery community and activities proposed to be undertaken under this project, the Committee Member for Cambodia suggested that the project should come up with recommendations to develop legal framework for supporting fishery communities in the participating countries to ensure the sustainability of the activities after the project completion.

43. The Committee Member for Myanmar requested SEAFDEC for the extension of the activity to cover co-management in small- and medium-fishery communities in Myanmar.

(15) Promotion of Fishing Licensing, Boats Registration and Port State Measures

44. In response to the query from the Committee Member for Malaysia on the basic requirements for the compilation of the regional vessel records, TD clarified that the basic requirements has been discussed during the Expert Groups Meeting on Fishing License and Boats Registration in June 2012 and the results are included in the published report of the Meeting. In this regard, the Program Committee was also informed that the requirements for the regional vessels record are initially for vessels 24 meters in length and above in accordance with the International Maritime Organization (IMO) standards. Moreover, the regional vessels record is in parallel with the FAO Global Record. In this connection, the representative from FAO/RAP informed the Program Committee that COFI has requested FAO to continue supporting the development of fishing vessels record and thus supports the development of a regional fishing vessels record to be implemented in Southeast Asia.

45. The Committee Member for Cambodia suggested that the Southeast Asian countries could consider the development of regional guidelines to implement the Port State Measures Agreement.

46. Furthermore, the representative for FAO/RAP also informed the Program Committee that FAO has considered providing technical assistance to Thailand for the development of a model port in Phuket.

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

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

47. The Committee Member for Vietnam informed the Program Committee that the conduct of a survey of small pelagic species using the M.V. SEAFDEC 2 in Vietnam waters was successfully implemented, and that Vietnam is planning to conduct a survey of the population dynamics of pelagic fishery resources in Vietnam waters using the M.V. SEAFDEC 2 in 2013. However, the budgetary requirements for such planned survey are still being discussed with the country's Ministry of Finance. In this regard, the representative from Vietnam requested to reserve the use of the M.V. SEAFDEC 2 for the year 2013.

48. The Committee Member for Japan appreciated the utilization of the M.V. SEAFDEC 2 in the conduct of fishery resources survey in Vietnam waters in 2012, and expressed the hope that the 5-year plan of Vietnam to conduct survey of small pelagic species using the M.V. SEAFDEC 2 could provide better information on the status of fishery resources in Vietnam waters. The Committee Member for Thailand also requested SEAFDEC to consider organizing a training course on resource survey to enhance capacity for Fishery Biologists of the DOF Thailand.

(17) Deep Sea Fisheries Resources Exploration in Southeast Asia

49. The Committee Member for Indonesia requested TD to continue the production of the set of information on deep sea fisheries resources, *i.e.* specimens, guidebooks, posters, leaflets, in layman's language, and to come up with sets of recommendations for future development of deep sea fisheries in Southeast Asia.

50. The Committee Member for the Philippines requested TD to provide technical assistance to enhance the capacity of BFAR staff on fish larvae identification specifically on tuna, sardines and other pelagic species. In addition, the Committee Member for Thailand also requested TD to consider the conduct of training on deep sea fisheries resources exploration and fisheries resource survey.

(18) Information Collection of Highly Migratory Species in Southeast Asia Waters

51. The Committee Member for Indonesia suggested that this project should come up with synthesized information on tuna fisheries in Southeast Asia and tuna industry in Southeast Asia (*e.g.* canning) which can be presented during the Tuna Trade Conference organized by INFOFISH every two



years to promote the work of SEAFDEC on these commercially-important species. However, the Program Committee was informed that some parts of the result of the project showing the status of tuna resources in the region had already been included in the SEAFDEC publication on the Southeast Asian State of Fisheries and Aquaculture 2012.

52. The Committee Member for Malaysia supported the continuation of the project and that TD could consider seeking funds to support the extension of the project.

(19) Development of Regional Database for Fishery Management

53. While commending SEAFDEC for pursuing the planned organization of the training to install and test the application of “fish landing data system” in the country’s routine data collection, the Committee Member for Brunei Darussalam requested to be kept informed on the final revised schedule of the training in December 2012. In a related development, the Committee Member for Myanmar reiterated that the training on the use of fish bio software for data collectors will go on as planned in January 2013 in Yangon, Myanmar.

54. Since this project will be terminated by the end of December 2012, the Committee Member for Indonesia suggested that TD should check whether the project objectives have been achieved or not and that certain activities under this project that overlap with some other projects, *e.g.* HRD project as well as activities on strengthening data collection should be merged. In addition, the Committee Member for Indonesia requested SEAFDEC to continue sharing the information compiled through the regional database to the Member Countries.

(20) Improvement of Information Gathering System for IUU Fishing Related Countermeasures in Southeast Asia

55. In responding to the concern of the Committee Member for Vietnam on the possible duplication of projects as well as methodologies especially with respect to information collection and data gathering, it was clarified that the project on data collection of highly migratory species focused on the status and trend of tuna landings in four countries (Indonesia, the Philippines, Thailand, and Vietnam) while this project aims to improve the design of information gathering system to be able to understand IUU fishing in tuna fisheries and thus, in a way are complementary with each other. In this connection, the Program Committee was also assured that the projects would be harmonized in the future not only in terms of the methodologies but also in the organization structure of the Departments to avoid possible duplication of efforts as well as prevent having misplaced projects in certain SEAFDEC Departments.

56. The Committee Member for Lao PDR commended SEAFDEC for the conduct of the activity related to information gathering on small-scale inland fisheries as this is very relevant to Lao PDR. He added that although this project will end in December 2012, Lao PDR would continue to support the maintenance of the database by TD as the information is useful for the sustainable management of fisheries in inland waters. In response, the Program Committee was informed that the database would continue to be maintained by TD after the termination of the project in December 2012.

(21) Tagging Program for Economically-important Pelagic Species in the South China Sea and Andaman Sea

57. While considering that this project will be terminated in December 2012, the Committee Member for Cambodia suggested that the final conclusion could include the migratory route and main habitats as well as the growth pattern of the transboundary species, and that the final output of the project should be able to help the Member Countries on the management of the fisheries of these transboundary species.

58. The Program Committee was informed that the required information is still being compiled for analysis, and that the result of the analysis of such information will be included in the final report of the project.

59. The Committee Member for the Philippines also suggested that the activity could still be pursued by the countries through their respective national activities after the termination of the project in December 2012. He added that for the Philippines, tagging could be conducted by fishing vessels operating in western Philippines through the observers' program engaged onboard such fishing vessels. In this regard, MFRDMD was requested to provide the countries with tags that are still available for this purpose.

60. In response, MFRDMD clarified that due to the minimum level of recapture rate and that most tagged fishes were recaptured few days after release, and nevertheless, the final report of the project will include some information on migration pattern and growth of tagged species. The report will be available in early 2013.

(22) Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters

61. The Program Committee was informed that this project includes an activity to study the biology of sharks, which was formulated in response to the request made by the SEAFDEC Council. Due to time constraints a new project on sharks could not be developed for funding support of the Japanese Trust Fund, and thus, the priority activity on the biology of shark was included as part of this project as proposed during the 34th Meeting of the Program Committee.

62. Since the project includes research on the biology of sharks and rays, the Committee Member for Indonesia suggested that the conduct of workshop on the identification of shark species could be continued by SEAFDEC. He also informed the Program Committee that a book on sharks (Economically-important Sharks and Rays in Indonesia) produced by the ACIAR could be used as reference. In this connection, although SEAFDEC expressed the willingness to conduct the said workshop, this will depend on availability of funds.

63. In responding to the concern of the Committee Member for Cambodia that information would be necessary for the development of common position on sharks and rays for the forthcoming CITES-CoP16, the Chief of MFRDMD mentioned that a book on look-alike species of sharks and rays which could also be used as field guide for the Member Countries would be published before the CITES-CoP16.

64. Concerned about the termination of the activity on interaction of sea turtles and fishing in December 2012, the Committee Member for the Philippines suggested that TD could consider the possibility of disseminating the results by the end of 2012 as the Philippines need the information for policy formulation on the use of circle hooks in line fishing gears. The result of the said activity is crucial for the conservation of sea turtles and suggested that other Member Countries should promote to their fishers not to target sea turtles especially in the southern part of Palawan Sea in the Philippines.

65. After the discussion, the Program Committee was informed that the activity on sharks under this project will be separated as an independent project starting in 2013, and SEAFDEC will continue to seek funding from donors to ensure the sustainability of the new project that will focus on the management of sharks in the region.

(23) Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region: Towards Better Utilization and Harmonized Information for Fisheries Management in Southeast Asia

66. The Program Committee took note of the completion of the project in 2012 and that one of the main outputs of the project was on the publication of the "Southeast Asian State of Fisheries and Aquaculture 2012" (SEASOFIA 2012) which has been disseminated to all SEAFDEC Member Countries as well as relevant agencies.

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

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

67. In order to maximize coordination within the Member Countries, the Committee Member for Indonesia reiterated that SEAFDEC National Coordinators (NCs) could serve as focal points for this project and to represent the Member Countries with respect to technical coordination work with SEAFDEC as well as to coordinate among various technical offices within their government agencies. In this connection, the NCs should be actively involved in the project activity on addressing fisheries-related issues. In responding to the Committee Member for Cambodia on the need for the results of RTCs to be shared and reported to the SEAFDEC Council and the ASEAN through the FCG/ASSP Mechanism, it was clarified that this is the usual process of SEAFDEC in order to seek policy advice and regional cooperation as well as to develop common understanding on the issues among the countries in the region.

68. While noting that the Regional Technical Consultations (RTCs) under this project in the past had been conducted every February, which is a proper timing for major international events, the Committee Member for Malaysia expressed the apprehension that the RTC in November 2012 may have been quite early and suggested that henceforth the RTC could be conducted in February 2013 instead of October 2013 as planned. In response, it was clarified that the RTC arranged in November 2012 was meant to discuss the list of species for CITES which came out in October 2012, and that the output of the RTC would be presented during the ASEAN Expert Group on CITES also arranged in November 2012. However, in order to attain the requirements of the Member Countries, the Program Committee was assured that the next RTC could be re-scheduled accordingly, as and when necessary.

69. The Committee Member for Cambodia expressed the concern that not all countries would be able to attend the CITES-CoP16. In this connection, he suggested that information compiled through the RTCs as well as other fora with regards to CITES issues could be shared with the Member Countries to enable them to be abreast of the recent developments and be able to discuss the issues with agencies involved in CITES matters. In a related development, the Program Committee was informed that a high level meeting will be convened by SEAFDEC with support from Japan in January 2013 to discuss on CITES issues possibly involving the SEAFDEC Council Directors. In this regard, the Committee Member for Cambodia suggested that the meeting could be held in parallel with the planned ASEAN Ministers responsible for implementation of CITES during the course of CoP16 in Bangkok to be convened before the CITES-CoP16, in order that aquatic species proposed for the CITES-CoP16 could be properly discussed with the ASEAN Experts Group on CITES.

70. The Committee Member for Cambodia expressed the concern that information on aquatic species of international concern has not been adequately addressed until the SOM-AMAF and AMAF Meetings, and that such concern had been conveyed to the ASEAN Secretariat and suggested that communication and coordination between SEAFDEC and the ASEAN Secretariat should be enhanced on this aspect.

71. The Committee Member for Malaysia suggested that SEAFDEC should explore the possibility of being invited to attend the SOM-AMAF Meetings as several fisheries-related issues are discussed during such Meetings.

(25) Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing-related Countermeasures

72. The Committee Member for Vietnam expressed the appreciation to Singapore for providing financial assistance for the conduct of the workshop on catch certification for small-scale fisheries in Nha Trang, Vietnam as well as to SEAFDEC for the technical support under this project framework. As a follow-up activity of the workshop, she suggested that the countries could consider developing a regional catch certification scheme appropriate for small-scale fisheries that would comply with the EU requirements. In this regard, it was clarified that the main role of SEAFDEC is to provide technical

support to the ASEAN Member States although the ASEAN Secretariat could help the countries by communicating with the EU on the possibility of developing the ASEAN Catch Certification which is acceptable by EU. In this connection, the Committee Member for Cambodia also suggested that the project could be extended in order to support the development of a regional certification scheme which could facilitate the intra-regional trade of fish and fishery products in the future.

4.1.2 Proposed New Programs Starting from the Year 2013

73. While considering the new programs proposed for 2013 (**Annex 5**), the Program Committee offered recommendations for the improvement of the programs and endorsed the proposed programs taking into consideration the following recommendations:

(1) Offshore Fisheries Resources Exploration in Southeast Asia

74. In responding the query on the definitions of “offshore fisheries” and “deep-sea fisheries” made by the Committee Member for the Philippines, the Program Committee was informed that identification of the features of offshore fisheries would be discussed during the first workshop to be organized as part of the project activities. After the explanation, he expressed the willingness of the Philippines to support the implementation of the project as planned, specifically on improvement of post-harvest fish handling at sea.

(2) Optimizing Energy Use and Improving Safety of Fishing Activities

75. The Committee Member for the Philippines supported the project considering the importance of the activities to improve the safety at sea of small-scale fishers in the region who are in danger from natural calamities, as well as in optimizing energy use in small-scale fisheries. He also suggested that the project could avail of the experiences and results of studies conducted by other organizations, *e.g.* BOBP-IGO, FAO Regional Fisheries Livelihoods Programme for Southeast Asia (RFLP). He added that the International Labour Organization (ILO) has implemented seafarer program based on the International Convention on Standards of Training, Certification and Watchkeeping for Fishermen (STCW-F), and that the project could consider this program as reference in its efforts to promote safety at sea of fishers. In this regard, the National Agriculture Training Council (NATC) of Malaysia requested TD to consider including students and trainers from NATC to participate in activities to be conducted onboard fishing vessels in Malaysian waters.

76. While suggesting that TD could consider the inclusion of medium-scale fishing vessels and that reduction of fuel consumption could be promoted by improving the efficiency of the engine and deck machinery (including reduction of manpower onboard), the Committee Member for Thailand also raised the concern that the use of fossil fuel will continue to increase, and thus, the use of alternative fuel should be pursued under the project especially with respect to the small-scale fishers.

77. While the actual size of small-scale vessels is not yet defined, the Committee Member for the Philippines suggested that the project could also make use of the new agreement on fishing vessel safety, known as the Cape Town Agreement of 2012 on the Implementation of the Provisions of the 1993 Protocol Relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, as reference for the implementation of the project.

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

78. While noting that the availability of data and information is crucial for policy planning and management of fisheries, the Program Committee was informed that the possibility of using the outputs and experiences from other relevant projects could be explored for the implementation of the project. In addition, the Committee Member for Vietnam informed the Program Committee that Vietnam would upgrade its fisheries database starting in 2013 in accordance with international and regional requirements, and suggested that TD could consider conducting the relevant project activities to support the Member Countries.



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

79. The Committee Member for Indonesia expressed the view that most countries in the region have developed their respective catch certification systems in order to comply with the EU requirement and be able to export fishery products to the EU. Considering that EU will only accept products that comply with its catch certification system, he suggested that this could be a clear justification for the development of a new certification system under the project. However, the Chief of MFRDMD clarified that the project intends to develop new catch certification system that are applicable for those fishing vessels that are not involved in the RFMO's catch documentation scheme and those not exporting their products to the EU using the EC Catch Certification. This is to support the intra-regional trade in the near future that requires the new regional catch certification.

80. The Committee Member for Thailand informed the Program Committee that Thailand has developed its national certification scheme which enables the country to export fishery products from small-scale fisheries to the EU. In this regard, she expressed the apprehension that developing another certification system for the region could make the small-scale fishers confused on which system to adopt.

81. The Committee Member for Vietnam expressed support to this project considering that catch certification is one of the tools to manage IUU fishing activities from small-scale fisheries, and that the development of such regional catch certification system could be initially based on the EC Regulation while other elements taking into consideration the specificity of the region's fisheries could be included later.

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

82. In responding to the concern of the Committee Member for Indonesia that this project could possibly duplicate the activities on genetic study under the tagging project, the Chief of MFRDMD explained that the activities under this new project would focus on different fish species.

83. The Committee Member for the Philippines suggested that the activities should also consider purse seine fishing operations and their fishing grounds. He also expressed the concern that since the region's fisheries is multi-species, the use of total allowable catch (TAC) system may not be applicable in the tropical region. In this connection, the project could consider comparing the TAC from tropical countries where target species include *Rastrelliger* spp. and scads with the TACs from those of the temperate countries.

(6) Research and Management of Sharks and Rays in the Southeast Asian Waters

84. The Committee Member for Indonesia informed the Program Committee that projects to collect information on shark species in Indonesian waters were conducted many years ago where the sharks specimens collected had been preserved, and suggested that the project could make use of such specimens for analysis. He then suggested that the samples should include sharks and rays collected from other Member Countries. The Committee Member for Malaysia took note of the proposed activities in 2013 with much interest and looked forward to the successful implementation of the project. He added that Malaysia is finalizing the review of its NPOA-Sharks with the objective of improving the Plan.

85. After clarification and deliberation, the Program Committee endorsed the proposed projects under the FCG/ASSP Mechanism. SEAFDEC assured the Program Committee that the comments and recommendations made at this Program Committee Meeting would be accommodated for the improvement of the projects. The Program Committee suggested that a detailed report should be submitted to the next Meeting of the FCG/ASSP and/or the SEAFDEC Council, as appropriate.

86. Considering that this is the first year for the projects under FCG/ASSP Mechanism to be grouped based on the SEAFDEC Program Thrusts, the Program Committee was informed that SEAFDEC Secretariat would consult with donors for the restructuring of the projects by merging projects with similar nature in order to avoid repetition and fragmentation of activities while ensuring that the needs and requirements of the Member Countries are addressed.

87. However, in the case of the Japanese Trust Fund Projects, the Deputy Secretary-General of SEAFDEC explained the process of developing the JTF annual plan and that activities are implemented based on the annual plan.

4.2 Departmental Programs

88. While considering the progress and achievements in the implementation of SEAFDEC Departmental Programs in 2012 and the proposed programs for 2013 (**Annex 6**), the Program Committee offered recommendations for the improvement of the programs and endorsed the proposed programs taking into consideration the following recommendations:

4.2.1 SEAFDEC Secretariat

(1) Center-wide Information Network

89. Considering that the activities under the Center-wide Information Network are regular activities of the SEAFDEC Secretariat, the Program Committee agreed that activities under this project that are funded by the Minimum Regular Contribution (MRC) would be maintained as regular and routine activities of the SEAFDEC Secretariat and would no longer be reported under the Departmental Programs of the SEAFDEC Secretariat.

4.2.2 Training Department

(2) Tailor-made Training Programs

90. The representative from the National Agriculture Training Council (NATC) of the Ministry of Agriculture and Industry of Malaysia informed the Program Committee that NATC has signed a collaborative arrangement with SEAFDEC since 2009 and several activities were conducted since 2010 with fruitful results. He therefore expressed the hope that the activities under the arrangement could be continued in 2013.

(3) Promotion and Enhancement of Fisheries Information

91. The Program Committee was informed that the project activities in 2013 would include: 1) the promotion and enhancement of fisheries knowledge; 2) production of fisheries information materials; 3) human capacity building for SEAFDEC information staff; and 4) strengthening of fishery information network.

(4) Improvement of Fisheries Technology and Reduction of the Impact from Fishing

92. The Committee Member for Lao PDR informed that data collection on freshwater fishing gears and methods should be undertaken in Lao PDR as the previous activities on this project was not completed. In this connection, he requested SEAFDEC to consider extending support to conclude this activity. In another aspect, the Committee Member for the Philippines suggested that the terminology on ‘destructive fishing gears and practices’ should be changed to a more appropriate terminology.

4.2.3 Aquaculture Department

93. The Program Committee was informed that AQD had shifted its R&D activities from commodity approach to thematic approach.



94. The Program Committee was also informed of the progress of R&D activities in 2012 of the following AQD Departmental Programs: 1) Quality Seed for Sustainable Aquaculture; 2) Healthy and Wholesome Aquaculture; 3) Maintaining Environmental Integrity through Responsible Aquaculture; 4) Adapting to Climate Change; and 5) Meeting Social and Economic Challenges in Aquaculture.

95. After the discussion on the SEAFDEC Departmental Programs, the Program Committee suggested that these programs should also be classified based on the SEAFDEC Program Thrusts.

96. Considering that many SEAFDEC projects will be completed in 2012, the Program Committee suggested that these projects should be evaluated to ensure that the objectives of the projects are achieved. Moreover, the results of such projects should be synthesized, packaged and disseminated to the Member Countries.

97. After the discussion and having been assured that the comments and recommendations made at this Program Committee Meeting would be accommodated to improve the projects, the Program Committee endorsed the proposed activities for 2013 under the SEAFDEC Departmental Programs.

4.3 Other Programs

98. The Program Committee considered and endorsed the progress in the implementation of one program under this program group in 2012 (**Annex 7**).

(1) Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program

99. The Program Committee was informed that TD has conducted since 2008 this cetacean sighting project and that information had been compiled on cetaceans found along the cruise of the M.V. SEAFDEC 2 and Member Countries' research vessels as well as the cetacean hotspots in Southeast Asian waters.

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

100. The Program Committee took note of the status of the pipeline projects of SEAFDEC in 2012 and expressed the hope that the projects could be finally implemented in 2013 (**Annex 8**), after discussion and negotiation process with potential donor agencies.

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

101. The Committee Member for Malaysia informed the Program Committee that Malaysia prefers to wait for updated information on the status of the approval of the project, and added that if the project involves soft loan term, Malaysia may reconsider its involvement in the project.

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

102. The Program Committee was informed that UNEP had decided to use international waters allocation instead of biodiversity allocation to support this project, and thus, it is possible that the project could take off in early 2013 provided that all participating countries submit their endorsement letters by the end of December 2012 or January 2013. Once this process is completed the project will be submitted to the GEF Council for approval not later than mid of February 2013.

103. The Committee Member for Cambodia informed the Program Committee that the first phase of the South China Sea Project (2001-2008) had five participating countries, namely: Cambodia, Indonesia, the Philippines, Thailand, and Vietnam, while for the second phase of the project Malaysia has been invited to join the project. He expressed the hope that the project could be finally started in 2013, since the Philippines and Cambodia had already signed the endorsement letter for the second

time. In addition, the Committee Member for Indonesia informed the Program Committee that he will consult his government regarding the Indonesian support for this project.

(3) Improving Methodologies and Capacity for the Collection of Capture Fishery Statistics in the Southeast Asian Region

104. The Program Committee was informed that the use of conventional methodology of collecting fishery statistics might not be appropriate for achieving the target of the project, and thus, the project has been designed with the objective of developing non-conventional methodologies to improve the quality of fishery statistics collected. The Program Committee was also informed that the five-year project had been proposed for funding by the Asian Development Bank (ADB) three months ago but until now there has been no feedback on the status of this proposal.

(4) Fisheries Resources Management on Important Pelagic Species for Sustainable Fisheries in the Sulu-Sulawesi Sea

105. The Program Committee noted that this five-year project has been proposed for funding support from the ADB, and that SEAFDEC is waiting for the response from ADB. In this connection, the Committee Member for Malaysia expressed support to this proposal and offered to host the inception meeting of the project in Sabah, Malaysia.

106. After the discussion of all SEAFDEC programs, the Program Committee suggested that in the formulation of future programs, efforts should be made to avoid repetition of activities as well as possible revival of already completed activities. In addition, the Program Committee also suggested that project titles should be more specific to reflect the actual scope of the projects and that the objectives should conform to this.

107. The Committee Member for Thailand inquired about the mechanism within SEAFDEC of proposing projects during the year in case there are urgent issues that emerge after the Program Committee Meeting. In response on the availability of a mechanism within SEAFDEC for adjustments of projects in the course of their implementation to accommodate the requirements of the Member Countries, the SEAFDEC Secretary-General explained that this issue would be raised for discussion by the Third SEAFDEC Review Committee. In particular, the current planning process could be adjusted to enable the Member Countries to take part in the formulation of the projects and activities, and that the project proposals would be discussed with donors prior to submission to the Program Committee. With regards to the issue on the Minimum Regular Contribution (MRC), he also suggested that the level of MRC should allow SEAFDEC to accommodate emerging issues and activities as requested by the Member Countries.

VI. COOPERATION WITH NON-MEMBER GOVERNMENTS AND INTERNATIONAL/ REGIONAL ORGANIZATIONS

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

109. The representative from the Bay of Bengal Programme-Intergovernmental Organization (BOBP-IGO), *Dr. Yugraj Singh Yadava* expressed his gratitude to SEAFDEC for inviting BOBP-IGO to the 35th Program Committee Meeting. He mentioned that BOBP-IGO and SEAFDEC have been taking part in events organized by both organizations, and at the regional level both SEAFDEC and BOBP-IGO are collaborating partners with the Asia-Pacific Fisheries Commission and the Bay of Bengal Large Marine Ecosystem Project, etc. Both organizations also have long history of work in the region's fisheries development and have common concern on small-scale fisheries, food and nutritional security. BOBP-IGO looks forward to cooperating and exchanging each other's experiences, successes and failures as well as sharing of information on issues of mutual interest by both SEAFDEC and BOBP-IGO. His Statement appears as **Annex 9**.



110. The representative from the Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific (FAO/RAP), *Mr. Robert Lee* expressed his appreciation to SEAFDEC for inviting FAO to the 35th Program Committee Meeting and to MFRD as host for the warm hospitality. He informed the Meeting about the important involvement of SEAFDEC as an important partner in the GEF funded REBYC-II CTI and the project's important contribution to strengthening fisheries management in the region. He also informed about other collaborating activities with SEAFDEC and that FAO will be following up with SEAFDEC Member Countries for expression of interest and support for the GEF project on Implementing the Strategic Action Programme for the South China Sea Region - Sustainable Fisheries and Mariculture. Furthermore, he complimented SEAFDEC for the activities carried out for the Member Countries. He encouraged the Program Committee to build greater cooperation among countries and explore opportunities to seek funding from both national budgets and international donors. His statement appears as **Annex 10**.

111. The representative from the United States Agency for International Development/Regional Development Mission for Asia (USAID Asia), *Ms. Mikell O'Mealy* expressed her appreciation to SEAFDEC for extending the invitation to USAID Asia to attend the 35th Meeting of the SEAFDEC Program Committee. She gave a brief overview on the activities of USAID Asia conducted in the Southeast Asian region in collaboration with other international organizations. She also informed that certain countries could be supported by the USAID Asia, namely: Cambodia, Indonesia, Myanmar, Thailand, and Vietnam. USAID Asia looks forward to working closely with SEAFDEC in the implementation of regional projects in the future, particularly under the priority areas on marine and coastal resources conservation, food security, and biodiversity conservation.

VII. OTHER MATTERS

7.1 Introduction of the Japanese Trust Fund for 2013 and Onward

112. The Program Committee took note of the status of the Japanese Trust Fund for 2013 and Onward (**Annex 11**). In this connection, the Committee Member for Japan informed the Program Committee that the Fisheries Agency of Japan decided to provide Trust Fund VI to SEAFDEC to support sustainable development of fisheries in the region. In response, the Secretary-General of SEAFDEC thanked Japan for the extended support to SEAFDEC through the Trust Fund Program.

7.2 Cooperation with USAID-CTI on the Intergovernmental Forum on Live Reef Food Fish Trade (LRFFT)

113. The Program Committee was informed that SEAFDEC Secretariat intends to organize the Intergovernmental Forum on Live Reef Food Fish Trade tentatively scheduled from 31 January 2013 to 1 February 2013 in collaboration with the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) and with funding support from the USAID Asia (**Annex 12**). Since the forum will involve only four SEAFDEC Member Countries, the Committee Member for Cambodia expressed the concern that the involvement of only few countries in the project may not be fully efficient in the conservation of the resources, and sought the consideration of USAID Asia to extend support for the participation of other countries in the Southeast Asian region.

114. In this regard, the Secretary-General of SEAFDEC clarified that this forum is only in the initial stage to obtain better understanding of the status of live reef fish trade of the region and that the results of this first forum would be shared with the other countries in the region, while the involvement of the other countries could be considered at the later stage of the project.

7.3 Cooperation with FAO on the Workshop on Fish Passage

115. The Program Committee took note of the proposed workshop on Fish Passage which would be conducted by FAO in collaboration with SEAFDEC in Khon Kaen Province, Thailand on 17-21 March 2013 (**Annex 13**). While FAO would financially support the participation of resource persons and 20 participants from the Member Countries based on FAO's terms and conditions, SEAFDEC will explore the possibility of engaging additional resource persons. In this connection, the Program Committee

expressed willingness of the countries to take part in the workshop, except Singapore which would inform the SEAFDEC Secretariat later on their participation of the workshop.

7.4 Views of the SEAFDEC Member Countries on the Draft Guidelines for the Establishment of SEAFDEC Collaborating Centres

116. The Committee was briefed on the Views of the SEAFDEC Member Countries on the Draft Guidelines for the Establishment of SEAFDEC Collaborating Centres, which appears as **Annex 14**, which was prepared patterned after the World Organisation for Animal Health (OIE) Terms of Reference and Internal Rules for Collaborating Centres.

117. The SEAFDEC Secretary-General requested the Member Countries to look closely into the draft guidelines as this could pave the way for the establishment of collaboration with other centers of excellence in the region, not necessarily focusing on the AVA Post-harvest Technology Center in Singapore which is already carrying out MFRD programs.

118. With regards to the Draft Guidelines (**Annex 15**) as elaborated by Singapore, the Program Committee supported in principle the Draft Guidelines taking into consideration the areas where consideration/modification could be considered, namely:

- Para 13 “... *Collaborating Centre would decide on which SEAFDEC programs it would be able to implement for the year, based on its financial and manpower resources, and may exercise the option of not executing all programs that have been decided by the Council of SEAFDEC for that particular Collaborating Centre.*” To be modified taking into consideration certain commitment of the collaborating centers in the implementation of SEAFDEC programs.
- Paragraph 14 ... (to be reconsidered)
- Paragraph 15 ... (to be reconsidered)
- Paragraph 18 Article 2 “...” To be reconsidered as this does not coincide with the existing TOR of the Program Committee, and there is no Expert Advisory Committee in the SEAFDEC mechanism.

119. The Program Committee requested the SEAFDEC Secretariat to accommodate the abovementioned comments and come up with a revised Draft Guidelines, and circulate to National Coordinators before submission to the SEAFDEC Council for consideration.

120. In response to the request of the Committee Member for Japan for the SEAFDEC Secretariat to compare “Collaborating Partners” with “SEAFDEC Collaborating Centres”, it was clarified that when SEAFDEC enters into a formal arrangement with a certain organization as a collaborating partner, such organization does not get involved in the internal policy matters of SEAFDEC. While a SEAFDEC Collaborating Centre will “form part of an inter-institutional collaborative network of SEAFDEC to support its programme at the country, inter-country, regional, inter-regional and global levels, as appropriate, with the approval of the Council of SEAFDEC” (Para 9 of the Draft Guidelines).

VIII. RECOMMENDATIONS OF THE THIRTY-FIFTH MEETING OF THE PROGRAM COMMITTEE

8.1 Adoption of Report of the Meeting

121. The Program Committee adopted its recommendations of the Thirty-fifth Meeting on 28 November 2012. The Program Committee also took note that the Report would be submitted to the 45th Meeting of SEAFDEC Council and to ASEAN through the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP).

8.2 Date and Venue of the Thirty-sixth Meeting of the Program Committee

122. In considering the date and venue of the Thirty-sixth Meeting of the Program Committee, the Chief of MFRDMD informed the Program Committee that MFRDMD would host the Thirty-sixth



Meeting in Malaysia. She also informed the Program Committee that MFRDMD would seek the guidance of the Secretariat in finalizing the schedule and related arrangements for the Meeting.

IX. CLOSING OF THE MEETING

123. 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 MFRD 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 16**.

LIST OF PARTICIPANTS

BRUNEI DARUSSALAM

Ranimah Haji A. Wahab (Mrs.)
Acting Deputy Director of Fisheries,
SEAFDEC Alternate Council Director, and
SEAFDEC National Coordinator for
Brunei Darussalam

Department of Fisheries
Ministry of Industry and Primary Resources
Jalan Menteri Besar
BB3910, Negara Brunei Darussalam
Tel: +673 2382862
Fax: +673 2382069
E-mail: ranimah.wahab@fisheries.gov.bn or
perikanan.mipr@industry.gov.bn

Munah Haji Lampoh (Mrs.)
Senior Fisheries Officer

Department of Fisheries
Ministry of Industry and Primary Resources
Jalan Menteri Besar
BB3910, Negara Brunei Darussalam
Tel: +673 2383412
Fax: +673 2382069
E-mail: munah.lampoh@gmail.com or
perikanan.mipr@industry.gov.bn

CAMBODIA

Ing Try
Deputy Director-General of Fisheries
Administration, and SEAFDEC National
Coordinator for Cambodia

Fisheries Administration
#186 Preah Norodom Blvd.
Tonle Basac, Chamkar Mon
Phnom Penh, Cambodia
Tel: +855 12 995665
Fax: +855 23 215470
E-mail: ingtry@gmail.com

Thor Sensereivorth
Acting Director of Planning, Finance and
International Cooperation

Department of Planning, Finance and
International Cooperation
Fisheries Administration
#186 Preah Norodom Blvd.
Tonle Basac, Chamkar Mon
Phnom Penh, Cambodia
Tel: +855 12 868815
Fax: +855 23 215470
E-mail: sereywath@hotmail.com

INDONESIA

Dr. Achmad Poernomo
Researcher

Agency for Marine and Fisheries Research and
Development
Ministry of Marine Affairs and Fisheries
Jl. Pasir Putih I, Ancol Timur
Jakarta Utara 14430, Indonesia
Tel: +62 21 64711583
Fax: +62 21 64711438
E-mail: achpoer@yahoo.com



Shanti Dewi Hafsanita (Ms.)
Head of Cooperation Sub Division

Agency for Marine and Fisheries Research and
Development
Ministry of Marine Affairs and Fisheries
Jl. Pasir Putih I, Ancol Timur
Jakarta Utara 14430, Indonesia
Tel: +62 21 64711583
Fax: +62 21 64711438
E-mail: kerjasama.litbangkp@gmail.com or
shanti.amfrd@gmail.com

Elvi Wijayanti (Mrs.)
Deputy Director of Multi-lateral Cooperation

Center for Analysis for Marine and Fisheries
International Cooperation
Secretariat General
Ministry of Marine Affairs and Fisheries
Jl. Medan Merdeka Timur No.16
Jakarta Pusat, Indonesia
Tel: +62 8158844503
E-mail: elviwijayanti@yahoo.com

Aniza Suspita (Mrs.)
Policy Analyst for ASEAN Cooperation

Center for Analysis for Marine and Fisheries
International Cooperation
Secretariat General
Ministry of Marine Affairs and Fisheries
Jl. Medan Merdeka Timur No.16
Jakarta Pusat, Indonesia
Tel: +62 81806561532
E-mail: asuspita@yahoo.com

JAPAN

Takeshi Miwa
Assistant Director, Overseas Fisheries
Cooperation Office, International Affairs
Division, and SEAFDEC National
Coordinator for Japan

Fisheries Agency of Japan
1-2-1, Kasumigaseki, Chiyoda-ku
Tokyo, Japan
Tel: +81 3 67442367
Fax: +81 3 35020571
E-mail: takeshi_miwa@nm.maff.go.jp

LAO PDR

Bounthong Saphakdy
Director of Fisheries Division, and SEAFDEC
Alternate Council Director for Lao PDR

Department of Livestock and Fisheries
Ministry of Agriculture and Forestry
P.O. Box 6644, Vientiane 01000
Lao PDR
Tel/Fax: +856 21 217869
E-mail: saphakdy@yahoo.com

Vannaphar Thammajedy
Deputy Director of Namxouang Aquaculture
Development Center

Department of Livestock and Fisheries
Ministry of Agriculture and Forestry
P.O. Box 6644, Vientiane 01000
Lao PDR

MALAYSIA

Ismail Abu Hassan
Deputy Director-General of Fisheries
(Development), and SEAFDEC Alternate
Council Director for Malaysia

Department of Fisheries Malaysia
Level 6, Tower Block 4G2
Wisma Tani, Precinct 4
62628 Putrajaya, Malaysia
Tel: +603 88704006
Fax: +609 88895490
E-mail: ismail@dof.gov.my

Rodiah Idris (Mrs.)
Director, Planning and Development Division,
and SEAFDEC National Coordinator for
Malaysia

Planning and Development Division
Department of Fisheries Malaysia
Level 2, Tower Block 4G2
Wisma Tani, Precinct 4
62628 Putrajaya, Malaysia
Tel: +603 88704215
Fax: +609 88891195
E-mail: rodiah@dof.gov.my

MYANMAR

Htun Win
Director, Department of Fisheries, and
SEAFDEC National Coordinator for Myanmar

Department of Fisheries
Ministry of Livestock and Fisheries
Building 36, Nay Pyi Taw
Myanmar
Tel: +95 67 408472
Fax: +95 67 408473
E-mail: twtunwinkyi1@gmail.com

PHILIPPINES

Dr. Jonathan O. Dickson
Chief, Capture Fisheries Division, and
SEAFDEC National Coordinator for
Philippines

Bureau of Fisheries and Aquatic Resources
PCA Bldg., 4th Floor Annex
Elliptical Road, Diliman
1100 Quezon City, Philippines
Tel: +63 2 9294296
Fax: +63 2 9294296
E-mail: jod_bfar@yahoo.com

Dennis Del Socorro
Regional Director, Regional Fisheries Office
No. V

Bureau of Fisheries and Aquatic Resources
Regional Fisheries Office No.V
San Agustin, Pili/NAGA
4418 Camarines Sur, Philippines
Tel: +63 54 4777365
Fax: +63 54 4773741
E-mail: bfar5_recordsection@yahoo.com or
joelle5089@yahoo.com

Nereo G. Casil
Regional Director, BFAR CARAGA

Bureau of Fisheries and Aquatic Resources
SC Bldg., Montilla Boulevard
Butuan City, Philippines
Tel: +63 85 3411379
Fax: +63 85 3426295, 3418208
E-mail: nereo_casil@yahoo.com.ph



Ruben J. Jardín
Regional Director, BFAR RFO #1V-B
(MIMAROPA)

Bureau of Fisheries and Aquatic Resources
2nd Floor, Concepcion Bldg. II
J.P. Rizal, St. San Vincete, Calapan City
Tel: +63 43 2881392
Fax: +63 43 2881392
E-mail: ordbfar4B@gmail.com or
rubenjardin@gmail.com

SINGAPORE

Melvin Chow Wing Chung
Deputy Director, Planning and Management
(Food Supply), and SEAFDEC National
Coordinator for Singapore

Agri-Food & Veterinary Authority of Singapore
5 Maxwell Road, #03-00 Tower Block
MND Complex, Singapore 069110
Tel: +65 63257635
Fax: +65 62206068
E-mail: Melvin_Chow@ava.gov.sg

Lim Huan Sein
Deputy Director (Aquaculture)

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

Malinee Smithrithee (Mrs.)
Director of Fisheries Foreign Affairs
Division, and SEAFDEC National
Coordinator for Thailand

Department of Fisheries
Kaset Klang, Chatuchak
Bangkok 10900, Thailand
Tel: +66 25798215
Fax: +66 25798215
E-mail: malinee_pom@hotmail.com

Kom Silapajarn
Director of Planning Division

Department of Fisheries
Kaset Klang, Chatuchak
Bangkok 10900, Thailand
Tel: +66 25620539
Fax: +66 25620531
E-mail: ksilapajarn@yahoo.com

Adhinand Indrapim (Ms.)
Fishery Biologist
Fisheries Foreign Affairs Division

Department of Fisheries
Kaset Klang, Chatuchak
Bangkok 10900, Thailand
Tel/Fax: +66 25620529
E-mail: adhinand@gmail.com

Sujitra Mavech (Ms.)
Foreign Relations Officer
Fisheries Foreign Affairs Division

Department of Fisheries
Kaset Klang, Chatuchak
Bangkok 10900, Thailand
Tel/Fax: +66 25620530

VIETNAM

Nguyen Thi Trang Nhung (Ms.)
Deputy Director of Science, Technology and
International Cooperation Department, and
SEAFDEC National Coordinator for Vietnam

Fisheries Administration
Ministry of Agriculture and Rural Development
10 Nguyen Cong Hoan, Ba-Dinh District,
Hanoi, Vietnam
Tel: +84 912153865
Fax: +84 4 37245120
E-mail: trangnhung73@yahoo.com

Nguyen Thi Hong Nhung (Ms.)
Science, Technology and International
Cooperation Department

Fisheries Administration
Ministry of Agriculture and Rural Development
10 Nguyen Cong Hoan, Ba-Dinh District,
Hanoi, Vietnam
Tel: +84 912153865
Fax: +84 4 37245120
E-mail: nhung.doa@gmail.com

THE BAY OF BENGAL PROGRAMME-INTERGOVERNMENTAL ORGANIZATION (BOBP-IGO)

Dr. Yugraj Singh Yadava
Director

Bay of Bengal Programme Inter-Governmental
Organization
91, St. Mary's Road, Abhiramapuram
Chennai, Tamil Nadu, India
Tel: +91 44 24936188
Fax: +91 44 24936102
E-mail: yugraj.yadava@bobbigo.org

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)

Robert Lee
Fishery Industry Officer

Food and Agriculture Organization of the United
Nations (FAO)
Regional Office for Asia and the Pacific
39 Phra Atit Road, Bangkok 10200
Thailand
Tel: +66 2 6974146
Fax: +66 2 6974445
E-mail: Robert.Lee@fao.org

NATIONAL AGRICULTURE TRAINING COUNCIL (NATC), MALAYSIA

Ganesan Vethiah
Fisheries Officer, Planning And Development

National Agriculture Training Council
Ministry of Agriculture and Industry
Level 3, Block 4G1, Wisma Tani
62624 Putrajaya, Malaysia
Tel: +60 0133916277
Fax: +60 3 88701699
E-mail: ganesan@moa.gov.my

Rozimah Binti Yusof (Mrs.)
Fisheries Officer, Training and Compliance

National Agriculture Training Council
Ministry of Agriculture and Industry
Level 3, Block 4G1, Wisma Tani
62624 Putrajaya, Malaysia
Tel: +60 3 88701675
Fax: +60 3 88886908
E-mail: rozimah@moa.gov.my



U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)

Renerio Acosta
Regional Environment Program Specialist

USAID/Regional Development Mission for Asia
63 Wireless Road, Lumpini
Patumwan, Bangkok 10330, Thailand
Fax: +662 2573099
E-mail: racosta@usaid.gov

Mikell O'Mealy (Ms.)
Natural Resources Officer

USAID/Regional Development Mission for Asia
63 Wireless Road, Lumpini
Patumwan, Bangkok 10330, Thailand
Tel: +662 2573000
Fax: +662 2573262
E-mail: momealy@usaid.gov

SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER (SEAFDEC)

SEAFDEC Secretariat

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

P.O. Box 1046, Kasetsart Post Office
Bangkok 10903, Thailand
Tel: + 662 9405682
Fax: +662 9406336
E-mail: sg@seafdec.org

Kenji Matsumoto
Deputy Secretary-General, and Deputy Chief
of SEAFDEC/TD

P.O. Box 1046, Kasetsart Post Office
Bangkok 10903, Thailand
Tel: +662 9406331
Fax: +662 9406336
E-mail: dsg@seafdec.org

Dr. Magnus Torell
Senior Advisor

P.O. Box 1046, Kasetsart Post Office
Bangkok 10903, Thailand
Tel: + 662 9551557
Fax: +662 9406336
E-mail: magnus@seafdec.org

Dr. Somboon Siriraksophon
Policy and Program Coordinator

P.O. Box 1046, Kasetsart Post Office
Bangkok 10903, Thailand
Tel: + 662 9406333
Fax: +662 9406336
E-mail: somboon@seafdec.org

Nualanong Tongdee (Ms.)
Information Program Coordinator, *a.i.*

P.O. Box 1046, Kasetsart Post Office
Bangkok 10903, Thailand
Tel: + 66 29551517
Fax: +66 29406336
E-mail: nual@seafdec.org

Tadahiro Kawata
Technical Expert on Trust Fund Project

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

Hidenao Watanabe
Assistant Japanese Trust Fund Manager

P.O. Box 1046, Kasetsart Post Office
Bangkok 10903, Thailand
Tel: + 662 9406334
Fax: +662 9406336
E-mail: watanabe@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

SEAFDEC Training Department (TD)

Bundit Chokesanguan
Information and Training Division Head, and
Special Departmental Coordinator

P.O. Box 97, Phrasamutchedi Post Office,
Samut Prakan 10290, Thailand
Tel: + 662 4256120
Fax: +662 4256110
E-mail: bundit@seafdec.org

Dr. Yuttana Theparoonrat
Coastal Fisheries Management Division Head

P.O. Box 97, Phrasamutchedi Post Office,
Samut Prakan 10290, Thailand
Tel: + 662 4256120
Fax: +662 4256110
E-mail: yuttana@seafdec.org

Dr. Worawit Wanchana
Capture Fishery Technology Division Head

P.O. Box 97, Phrasamutchedi Post Office,
Samut Prakan 10290, Thailand
Tel: + 662 4256120
Fax: +662 4256110
E-mail: worawit@seafdec.org

Isara Chanrachkij
Fishing Technology Section Head,
Capture Fishery Technology Division

P.O. Box 97, Phrasamutchedi Post Office,
Samut Prakan 10290, Thailand
Tel: + 662 4256145
Fax: +662 4256110
E-mail: isara@seafdec.org or
hs1xdx@gmail.com

Dr. Taweekiet Amornpiyakit
Fisheries Resource Enhancement Section
Head, Coastal Fisheries Management Division

P.O. Box 97, Phrasamutchedi Post Office,
Samut Prakan 10290, Thailand
Tel: + 662 4256120
Fax: +662 4256110
E-mail: taweekiet@seafdec.org

Penchan Laongmanee (Mrs.)
Fishing Ground & Fishery Oceanography
Section Head, Capture Fishery Technology
Division

P.O. Box 97, Phrasamutchedi Post Office,
Samut Prakan 10290, Thailand
Tel: + 662 4256141
Fax: +662 4256110
E-mail: penchan@seafdec.org

Panitnard Taladon (Mrs.)
Training and Extension Section Head,
Information and Training Division

P.O. Box 97, Phrasamutchedi Post Office,
Samut Prakan 10290, Thailand
Tel: + 662 4256120
Fax: +662 4256110
E-mail: panitnard@seafdec.org



SEAFDEC Aquaculture Department (AQD)

Dr. Felix G. Ayson Chief of the Aquaculture Department	Tigbauan 5021, Iloilo, Philippines Tel/Fax: +63 33 5119174 E-mail: fgayson@seafdec.org.ph
Dr. Teruo Azuma Deputy Chief of the Aquaculture Department	Tigbauan 5021, Iloilo, Philippines Tel/Fax: +63 33 5118878 E-mail: azuma@seafdec.org.ph
Belen O. Acosta (Ms.) Senior Information Specialist, and Special Departmental Coordinator	Manila Office Rm 102, G/F, Philippine Social Science Center, Commonwealth Avenue, Diliman, Quezon City 1102, Philippines Tel: +63 2 9275542 Fax: +63 2 9277825 E-mail: bacosta@seafdec.org.ph
Dr. Relicardo M. Coloso Research Division Head	Tigbauan 5021, Iloilo, Philippines Tel: +63 33 5119171 Fax: +63 33 5119070 E-mail: colosor@seafdec.org.ph
Dr. Evelyn Grace Ayson (Mrs.) Training and Information Division Head	Tigbauan 5021, Iloilo, Philippines Tel: +63 33 5119172 Fax: +63 33 5118709 E-mail: edjayson@seafdec.org.ph
Dr. Emilia T. Quinitio (Ms.) Technology Verification and Demonstration Division Head	Tigbauan 5021, Iloilo, Philippines Tel: +63 33 5119171 Fax: +63 33 5119029 E-mail: etquinit@seafdec.org.ph

SEAFDEC Marine Fisheries Research Department (MFRD)

Yeap Soon Eong Chief of the Marine Fisheries Research Department	2 Perahu Road, Off Lim Chu Kang Road, Singapore 718915 Tel: + 65 6790 973 Fax: +65 68613196 E-mail: Yeap_Soon_Eong@ava.gov.sg
Neo Shan Yu (Ms.) Scientist/Post-Harvest Technology Division	2 Perahu Road, Off Lim Chu Kang Road, Singapore 718915 Tel: + 65 67907973 Fax: +65 68613196 E-mail: neo_shan_yu@ava.gov.sg

SEAFDEC Marine Fishery Resources Development and Management Department (MFRDMD)

Mahyam Mohd Isa (Ms.) Chief of the Marine Fishery Resources Development and Management Department	Fisheries Garden, Chendering 21080 Kuala Terengganu, Malaysia Tel: +60 9 6175940 Fax: +60 9 6175136 E-mail: mahyam@seafdec.org.my
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Dr. Masaya Katoh Deputy Chief of the Marine Fishery Resources Development and Management Department	Fisheries Garden, Chendering 21080 Kuala Terengganu, Malaysia Tel: +60 9 6175940 Fax: +60 9 6175136 E-mail: katoh@seafdec.org.my
Abu Talib Ahmad Special Departmental Coordinator	Fisheries Garden, Chendering 21080 Kuala Terengganu, Malaysia Tel: +60 9 6175940 Fax: +60 9 6175136 E-mail: abutalib@seafdec.org.my
Technical Secretaries:	
Virgilia T. Sulit (Mrs.) Fisheries Technical Officer	P.O. Box 1046, Kasetsart Post Office Bangkok 10903, Thailand Tel: + 662 9406326 Fax: +662 9406336 E-mail: sulit@seafdec.org
Sawitree Chamsai (Ms.) Policy and Program Officer-I	P.O. Box 1046, Kasetsart Post Office Bangkok 10903, Thailand Tel: + 662 9406326 Fax: +662 9406336 E-mail: sawitree@seafdec.org
Suwanee Sayan (Ms.) Policy and Program Officer-II	P.O. Box 1046, Kasetsart Post Office Bangkok 10903, Thailand Tel: + 662 9406326 Fax: +662 9406336 E-mail: suwanee@seafdec.org
Saivason Klinsukhon (Ms.) Information Officer-I	P.O. Box 1046, Kasetsart Post Office Bangkok 10903, Thailand Tel: + 662 9406326 Fax: +662 9406336 E-mail: saivason@seafdec.org
Leng Sam Ath RFPN Member for Cambodia	P.O. Box 1046, Kasetsart Post Office Bangkok 10903, Thailand Tel: + 66 29406326 Fax: +66 29406336 E-mail: samath@seafdec.org
Adi Wibowo RFPN Member for Indonesia	P.O. Box 1046, Kasetsart Post Office Bangkok 10903, Thailand Tel: + 66 29406326 Fax: +66 29406336 E-mail: adi@seafdec.org
Sisamouth Phengsakoun (Ms.) RFPN Member for Lao PDR	P.O. Box 1046, Kasetsart Post Office Bangkok 10903, Thailand Tel: + 66 29406326 Fax: +66 29406336 E-mail: sisamouth@seafdec.org



Keni Anak Ngiwol (Ms.)
RFPN Member for Malaysia

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

Dr. Kyaw Kyaw
RFPN Member for Myanmar

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

Ronnie O. Romero
RFPN Member for the Philippines

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

Issarapon Jithlang (Ms.)
RFPN Member for Thailand

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

Le Hong Lien (Mrs.)
RFPN Member for Cambodia

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

Fukiko Fujita (Ms.)
Secretary to the Deputy Secretary-General

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

Secretariat of the meeting:

Saowanee Wanothayarnchai (Mrs.)
Matinee Boonyintu (Ms.)
Julusak Markawat

E-mail: saowanee@seafdec.org
E-mail: matinee@seafdec.org
E-mail: julasak@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-fifth Meeting of SEAFDEC Program Committee in this beautiful city of Chiang Mai. Before going any further, I would like to thank the SEAFDEC Marine Fisheries Research Department for hosting this Meeting, although not in Singapore but here in Thailand.

Ladies and Gentlemen, you must have noticed that for this Meeting, we are changing the order of the review of implementation of the SEAFDEC programs. While before the review started with the Departmental Programs followed by Programs under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership Mechanism or FCG/ASSP, other programs and pipeline programs, this year we will start with the Programs under the FCG/ASSP Mechanism followed by Departmental Programs and other programs, and pipeline programs. Specifically, please be aware that 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, a special session is allocated to solicit the consideration of the Program Committee on the Draft Guidelines for the Establishment of SEAFDEC Collaborating Centers.

Ladies and Gentlemen, our schedule from today until Wednesday will be very hectic, as we would review the results of implementation of the programs in 2012 as well as the proposed programs of activity for the Year 2013. The review would take into consideration the 2011 Resolution and Plan of Action, the needs of the Member Countries and policy directives given by the SEAFDEC Council. The outputs of this Meeting together with your recommendations would be submitted to the forthcoming meeting of the SEAFDEC Council for consideration and approval as well as to the ASEAN Sectoral Working Group on Fisheries or ASWGF_i as appropriate, through the Fifteenth Meeting of the FCG/ASSP to be held back-to-back with this Program Committee Meeting.

The members of the Program Committee are therefore invited to closely examine and if there is probable cause, to criticize the direction and objectives of the proposed programs of activity, as stipulated in the Terms of Reference of the SEAFDEC Program Committee. However, we would also welcome the advice, ideas, insights, and suggestions of our collaborating partners for the improvement of our programs to ensure that these are suitable for the requirements of the region.

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

With that, Ladies and Gentlemen, I now declare the Thirty-fifth Meeting of SEAFDEC Program Committee open.

Thank you very much.

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 2012 and Proposed Programs for the Year 2013

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

- Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)
- Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses
- Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement
- Human Resources Development (HRD) Programs on Fisheries Management Approaches for Sustainable Fisheries
- Strategies for Trawl Fisheries By-catch Management
- 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 “Biotxin Monitoring in ASEAN”
- Traceability Systems for Aquaculture Products in the ASEAN Region
- Utilization of Freshwater Fish for Value-added Products
- 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

- Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea
- Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management
- Promotion on Fishing License, Boats Registration and Port State Measures

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

- Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2
- Deep Sea Fisheries Resources Exploration in Southeast Asia
- Information Collection of Highly Migratory Species in Southeast Asia Waters



- Development of Regional Database for Fishery Management
- Improvement of Information Gathering System for IUU Fishing Related Countermeasures in Southeast Asia
- Tagging Program for Economically-important Pelagic Species in the South China Sea and Andaman Sea
- Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters
- Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region: Towards Better Utilization and Harmonized Information for Fisheries Management in Southeast Asia

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 and IUU Fishing Related Countermeasures

3.1.6 Proposed New Programs Starting from the Year 2013

- Offshore Fisheries Resources Exploration in Southeast Asia
- Optimizing Energy Use and Improving Safety in Fishing Activities
- Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in the Southeast Asian Region
- Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products
- 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

3.2 Departmental Programs

3.2.1 Secretariat

- Center-wide Information Network

3.2.2 Training Department

- Tailor-made Training Programs
- Promotion and Enhancement of Fisheries Information
- Improvement of Fisheries Technology and Reduction of the Impact from Fishing

3.2.3 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

3.3 Other Programs

- Cetacean Research in Southeast Asia Waters: Cetacean Sighting Program

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, Islamic Development Bank, SEAFDEC)
- Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (TD/UNEP/GEF/SCS)
- Improving Methodologies and Capacity for the Collection of Capture Fishery Statistics in the Southeast Asian Region (new)
- Fisheries Resources Management on Important Pelagic Species for Sustainable Fisheries in the Sulu-Sulawesi Sea (new)

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

Agenda 6: Other Matters

- 6.1 Introduction of the Japanese Trust Fund for 2013 and Onward
- 6.2 Cooperation with the USAID-CTI on the Intergovernmental Forum on Live Reef Food Fish Trade (LRFFT)
- 6.3 Cooperation with FAO on the Workshop on Fish Passage
- 6.4 Views of the SEAFDEC Member Countries on the Draft Guidelines for the Establishment of SEAFDEC Collaborating Centres (*Closed Session*)

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

- 7.1 Adoption of Report of the Meeting
- 7.2 Date and Venue of the Thirty-sixth 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 2012-2013**

Existing Programs

Program Thrust/Project Title	Lead Department	2012	2013
Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security			
Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)	TD	Y	N
Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses	TD	Y	N
Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement	TD	Y	Y
Human Resources Development (HRD) Programs on Fisheries Management Approaches for Sustainable Fisheries	TD	Y	Y
Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI)	TD	Y	Y
Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release	AQD	Y	Y
Promotion of Sustainable and Region-oriented Aquaculture	AQD	Y	Y
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 "Biotxin Monitoring in ASEAN" <i>Extended to include: ASP, AZA and BTX</i>	MFRD	Y	Y*
Traceability Systems for Aquaculture Products in the ASEAN Region	MFRD	Y	Y
Utilization of Freshwater Fish for Value-added Products ¹	MFRD	Y	Y
Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia	AQD	Y	Y
Food Safety of Aquaculture Products in Southeast Asia	AQD	Y	Y
Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries			
Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea <i>Proposed new title: Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia</i>	SEC	Y	Y*
Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management	TD	Y	N
Promotion on Fishing License, Boats Registration and Port State Measures <i>Proposed new title: Promotion of Countermeasures to Reduce IUU fishing activities</i>	TD	Y	Y*
Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries			
Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2	TD	Y	Y
Deep Sea Fisheries Resources Exploration in Southeast Asia	TD	Y	N
Information Collection of Highly Migratory Species in Southeast Asia Waters	TD	Y	N
Development of Regional Database for Fishery Management	TD	Y	N
Improvement of Information Gathering System for IUU Fishing Related Countermeasures in the Southeast Asia	TD	Y	N
Tagging Program for Economically-important Pelagic Species in the South China Sea and Andaman Sea	MFRDMD	Y	N

¹ This project has been funded by Government of Singapore since 2011



Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters	MFRDMD	Y	Y
Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region: Towards Better Utilization and Harmonized Information for Fisheries Management in Southeast Asia	SEC	Y	N
Thrust V: Addressing International Fisheries-related Issues from a Regional Perspective			
Assistance for Capacity Building in the Region to Address International Fisheries-related Issues	SEC	Y	Y
Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing Related Countermeasures <i>Proposed new title: Strengthening SEAFDEC Network for Sustainable Fisheries</i>	SEC	Y	Y*

Y = Program proposed/implemented during the year

N = Program not proposed/implemented during the year

Y* = Program to be implemented during the year, with newly proposed title

PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust I: Developing and promoting responsible fisheries for poverty alleviation and food security
Project Title:	Responsible Fishing Technologies and Practices (Fishing in harmony with nature)
Lead Department:	Training Department
Lead Country:	Thailand
Total Duration:	2008-2012 (completed)

1. INTRODUCTION

In following-up with the Resolution and Plan of Action endorsed at the Millennium Conference in 2001 and followed by the Resolution (RES) and Plan of Actions (PoA) on Sustainable Fisheries for Food Security for the ASAN Region Towards 2020, SEAFDEC Training Department (TD) has implemented a series of activities in collaboration with the Member Countries on responsible fishing technologies and practices.

In PoA 2020, the following issues related to responsible fishing and practices are mentioned:

PoA # 25 “*Conduct research on the impacts of various gear types and methods, including light fishing, trawls and push nets, on ecosystems and populations of aquatic animals and also the effects of fishing vessel discharges and waste disposal on marine ecosystems, to promote the use of selective fishing gears and sustainable devices*”; and

PoA # 26 “*Take reference from the FAO International Guidelines on Managing By-catch and Reducing Discards, where applicable, to identify and find solutions to ASEAN by-catch problems, including the excessive catch of juvenile fish*”.

In this regard, SEAFDEC has initiated and promoted the development and adoption of responsible fishing gear and practices in Southeast Asia aiming to minimize the impact of fishing activities to the coastal and marine environments. Such initiatives by SEAFDEC have been demonstrated through the implementation of: R&D activities on Turtle Excluder Devices (TEDs) and Juvenile and Trash Excluder Devices (JTEDs); human resources capacity building program on responsible fishing gear and practices; promotion of the concept on fisheries *refugia*; establishment of a network for reduction of impact from fishing to marine and coastal environment (IF-COME network); update fishing gear and practices of the destructive fishing gears as identified by the group of fishing gear technologists in SEAFDEC and other relevant meetings; etc.

The activities on the development and experiment on Juvenile and Trash Excluder Devices (JTEDs) have been conducted in the Asian region with the support of Japanese Trust Fund in conjunction with the additional support of FAO/UNEP/GEF Project on Reduction of Environmental Impact from Tropical Shrimp Trawling through the introduction of by-catch reduction technologies and change of the management. Through those activities, the JTEDs have been recognized in the region as effective devices for reduction of under-sized commercial fish species caught by the shrimp trawl. As a result, some country in the region such as the Philippines has already adopted the compulsory use of JTEDs in trawl fishing.

Many traditional fishing activities have been found to induce negative impacts on the coastal and marine environments as well as on the fisheries resources. In an effort to assess the extent of such impacts, SEAFDEC convened in January 2009 a workshop to address the concerns on the need to improve the designs and use of fishing gear in order to address the impacts of using such gear on the coastal and marine environments as well as mitigate sea turtle by-catch in fisheries. In late 2010, SEAFDEC has initiated the establishment of IF-COME network together with the draft of national plan of activities of the Member Countries to address this issue.

The research and study on the impact of fishing on environment and ecosystem have been conducted in the region, in collaboration with the Department of Fisheries-Thailand, Department of Fisheries-Myanmar, and Bureau of Fisheries and Aquatic Resources (BFAR) of the Philippines with the support of Tokyo University of Marine Science and Technology-Japan, and Kasetsart University-Thailand.

The interaction between threatened species of international concerned and fisheries has also been studied and investigated. The focus is particularly given to the effectiveness on the use of the TEDs in reducing sea turtle mortality. Besides, the information and data on the sea turtles mortality has been collected in the region in collaboration with Member Countries of SEAFDEC and with the assistance of countries of IOSEA/MOU. SEAFDEC has also made a great effort and contribution to many international meetings and conferences through the presentation of its achievement during the course of promotion on the use of TEDs and circle hooks.

Another work is a series of the compilation on fishing gear and methods in Southeast Asia. The survey for this purpose was conducted in most of the Member Countries including both marine and inland capture fisheries. It was found that fishing gear monographs of SEAFDEC has been widely recognized and used as the reference and format for reporting of the fishing gear and methods in Southeast Asia.

2. PROJECT

2.1 Objectives

- 1) Promote responsible fishing technologies and practices through sea trial demonstration, series of experiments;
- 2) Promote concept and applicability of using selective fishing gear devices to reduce by-catch (juvenile, sea turtles, trash fish, etc.) in fishing; and
- 3) Improve responsible fishing technology and practices for the Southeast Asian countries.

2.2 Project Description

In line with the regional requirements suggested in the ASEAN-SEAFDEC RES & PoA 2020 and FAO Code of Conduct for Responsible Fisheries, SEAFDEC/TD has continued to promote the responsible fishing gear and practices to reduce: (i) by-catch of under-sized commercial important fish species; and (ii) the impact from fishing to marine and coastal environment. This aims to maintain good condition of the biodiversity and to secure fish for the people as well as to conserve living aquatic ecosystem.

The activities under this project were designed and developed with the basis of the current situation of the countries in the region aiming at promoting applications of the responsible fishing gear and practices for reduction of unwanted catch, by-catch, and incidental catch. The activity also included the initiatives and efforts to reduce the impact of fishing on coastal and marine resources/environment through the promotion on: energy optimization/reduction of fishing activities (utilization of lights in squid/anchovy fishing operation, etc.); assist Member Countries in conducting demonstration and research on these topics.

Over the past years, the implementation of the project has been supported by the Japanese Trust Fund in conjunction with FAO/GEF/RBIC-II CTI Project, national agencies, and other relevant organizations/institutes. The implemented activity also included staff exchange program, dispatch of experts and participation in the relevant meeting/workshops.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
1. Technical assistance on selective fishing gears and devices to reduce discards and by-catch of juvenile and trash fish in the region	30 April	TD jointly organized with FAO the “ <i>Fishing industry round table meeting and inception workshop of RBIC-2 Project</i> ” in Bangkok, Thailand. Experience of TD in addressing the issues on the reduction of juvenile and trash fish were shared with the key industries. This

		was useful for further implementation of the FAO/GEF/RyBIC2 Project (a 5-year project from 2012).
	June~	<p>Since 2011, coordination and collaboration with FAO has been arranged for stimulation and execution of the GEF supported 5-year project, FAO/GEF/RyBIC2 entitled “<i>Strategies for trawl fisheries by-catch management</i>”.</p> <p>TD also assisted the Member Countries (Indonesia, Philippines, Thailand, and Vietnam are the participating countries to the FAO/GEF/RyBIC2 Project) in developing their national activity for implementation of this project in their respective countries.</p> <p>In September 2012, the Agreement of working mechanism of SEAFDEC for implementation of FAO/GEF/RyBIC2 Project has been signed.</p> <p>Subsequently, the Letter of Agreement and Terms of Reference between SEAFDEC and FAO Head Quarter had been signed.</p>
2. Technical assistance for assessment of the impacts from various kind of fishing gear and practice on fisheries resources, environment and ecosystem	Jan to Feb	<p>TD assisted Department of Fisheries of Myanmar and Thailand in the process of planning and implementing the national studies as follow:</p> <ol style="list-style-type: none"> 1. Impact of squid fishing with lights on by-catch of juvenile of commercial important fish species in Kow Thuang, Myanmar; and 2. Impact of light fishing activities in the artificial reefs area in the Gulf of Thailand.
3. Interaction between threatened species of international concerned and fisheries	March	<p>Technical information on the use of circle hook to replace the conventional j-shape hook together with some samples of the circle hooks were disseminated to the local fishers, provincial fisheries officials, other key stakeholders in the Sabah state of Malaysia during the organization of the “<i>Fishing Trial and Demonstration to Promote the use of Circle Hook in Bottom Longline Fishing</i>”, from 12 to 16 March 2012, Sabah, Malaysia.</p>
4. Production of promotional materials and technical papers	Jan ~	<p>Guidelines on the Fishing Gear Survey have been prepared. It is envisaged that this publication can be released by early of 2013.</p>

3.2 Evaluation of the Program Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Responsible fishing technologies
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Inadequate knowledge/information on fishing gear and practices in particular to reduce by-catch, trash fish, and juvenile of commercial important aquatic species; • Inadequate enforcement for IUU fishing as resulted from the failure in managing fishing capacity in many countries of the region; and • Inadequate coordination and collaboration among national agencies responsible for fisheries management and conservation of endanger/threatened aquatic animals.

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • National adaption/acceptance on the use of responsible fishing gear and practice, such as use of JTED in bottom trawling; • Capability of human resources and national institutions to carry out research and promote responsible fishing gear and practices; • Establishment of a network on reduction of the impact of fishing gears and their practices to coastal and marine ecosystem; and • Establishment of the joint efforts among regional/national agencies for promoting integration of fisheries and habitat management.

3.2.3 “Steps” toward achieving final goals:

Step 1: Enhance knowledge of technologists in the Southeast Asian countries on responsible fishing gear and practice through research/study, sea trial and demonstration.
Step 2: Collect/update information on fishing gear and methods in the Member Countries through organization of regional technical meeting, field survey; participation of the project staff to relevant events/meetings, and modification of some of fishing gear and devices, considering appropriateness and applicability of such knowledge to the Member Countries.
Step 3: Widely acceptance and use of the responsible fishing gear and practices which has been promoted in the region by SEAFDEC or other relevant agencies.

3.2.4 Activities in the current project:

(1) Current position of the program: Step 1, 2, and 3
(2) Project duration: 2008~
(3) Main activities: <ul style="list-style-type: none"> • Collect and update fishing gear and methods using in Member Countries; • Improve fishing gear and its method to be more responsible manner; • Carry out and/or assist the Member Countries in planning, analyzing and reporting of research activity to address responsible fisheries, <i>e.g.</i> study on the reduction of the impact from fishing on coastal and marine ecosystem; and • Disseminate information on responsible capture fisheries to the Member Countries and other relevant agencies.

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project	
<ul style="list-style-type: none"> • Assist Member Countries to address responsible capture fisheries in the region; • Conduct sea trials, demonstration, and experiment on the use of responsible fishing gear and practices in the Member Countries based upon the request; • Organize or co-organize of technical meetings with relevant agencies; and • Disseminate information of the project outputs 	
(2) Main achievements till the end of 2012	
<ul style="list-style-type: none"> • Reports of the project activities; • Establishment of a network, and draft regional and national plan of actions for reduction of the impact from fishing gears and practices on coastal and marine environment; • Established collaboration mechanism with FAO/GEF, and other relevant agencies; • Joint study on the impact of the use of lights in fishing, collaboration with Department of Fisheries Myanmar and Thailand; and • Revision/issue of the national fisheries regulation(s) based on the studies carried out for reduction of the impact from fishing gear and practices. 	
(3) Outputs during the project period and expected achievement rate till the end of 2012	
Expected Outputs	Achievement rate (%)
1. Technical assistance on responsible fishing gear and practices to reduce discards and by-catch of juvenile and trash fish in the region.	100%
2. Technical assistance for assessment of the impacts from various kind of fishing gear and practices on fisheries resources, environment, and ecosystem.	100%
3. Interaction between threatened species of international concerned and fisheries.	100%
4. Production of promotional materials and technical papers	100%

3.2.6 Evaluation of project activities in 2012:

With regard to effort on reduction of the impact from fishing to coastal and marine environment, two (2) activities were implemented in 2012; (i) joint study with the Department of Fisheries (Myanmar and Thailand) on the impact of fishing with lights on by-catch of juvenile and trash fish (JAT), and (ii) technical assistance of SEAFDEC/TD to FAO/GEF/RBIC02 Project (5-year project from 2013 to 2017).
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The joint study with Myanmar was carried out in the southern part of Myanmar, Kow Thaung area, focusing on by-catch of JAT in capturing process of squid fishing with lights. The latter joint study with Thailand focuses on the possible impacts of fishing with lights on by-catch of JAT in the artificial reefs – Gulf of Thailand. The preliminary report of these two studies have been prepared and drafted. In summary, insignificant percentage of the JAT by-catch was recorded when compared to the main target species of such fishing gear/practice. It is planned that their full reports can be released by the end of 2012.

Regarding the development of GEF supported a 5-year FAO/GEF/RyBIC2 Project, which the project participating countries include SEAFDEC Member Countries namely Indonesia, Philippines, Thailand, and Vietnam, TD has arranged a technical team to assist the project implementation in particular for the activities at the regional level. In the 3rd quarter of the year 2012, the working mechanism between SEAFDEC and FAO/GEF/RyBIC 2 Project has been established. In addition, inputs of TD to this project also include technical assistance to the project participating countries for formulation and development of the national plan of activities to be implemented under this project. In September 2012, the TOR and LOA between SEAFDEC and FAO have been signed for execution of this project.

Concerning the activity to raise awareness on reduction of the sea turtle by-catch, sea trial and demonstration on the use of circle hooks (c-hook) in hook-and-line fishing had been carried out in Sabah state of Malaysia in 2012. After demonstration, it was found that local long-line fishers have interested in applying the use of c-hook for the fishing operation. Nevertheless, the market availability of the c-hook in the area is still a major constraint. During the demonstration, it was informed by DOF-Malaysia that Sabah state has also been implemented a series of activities to promote the reduction endangered aquatic species by-catch including sea turtles. It is envisaged that experience from TD could be used in as the reference for effective implementation of their activity also in the future.

In addition, TD has compiled and drafted a guideline on fishing gear survey with the aim to provide Member Countries the knowledge for fishing gear survey based on experience of TD over the decades in implementing responsible capture fisheries. The guidelines will be useful for fisheries officials (fishing gear technologists, extension officers, researchers, etc.) who want to conduct fishing gear survey. Throughout the survey, information on the current fishing gear design and their practices could be systematically obtained and reported using the same format. It is envisaged that this publication will be completely finalized by the end of 2012, and released during the 1st quarter of 2013.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

No activity proposed for 2013 as the project will be completed in 2012.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust I: Developing and promoting responsible fisheries for poverty alleviation and food security
Project Title:	Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvested Losses
Lead Department:	Training Department
Lead Country:	Thailand
Total Duration:	2008-2012 (completed)

1. INTRODUCTION

Development of alternative fisheries resources currently under-exploited resources living in un-trawlable areas in the region is considered possible. However there is inadequate information to support this kind of development. Major reasons for these include: stocks may be not being utilized at the maximum sustainable level; inadequate experience to harvest and process this fisheries resources; and unclear market demand. To supplement the achievement of the utilization of these resources, on-board and on-shore post-harvest fish handling techniques are required. It is therefore, the activities under this project include R&D for development of appropriate fish sampling gear in un-trawlable areas, and promotion of the appropriate post-harvest fish handling techniques.

Project activities also include technical advice on improvement of catch quality on-board fishing vessels through on-site training programs based on the current situation of the countries. Concerning that many of onboard fish handling and preservation techniques of the fishing vessels in the Southeast Asian region are still in the developing stage. Nevertheless, the demands of fish and living aquatic animal have gradually increased particularly for the human consumption. It is therefore, another activities under this project aims to improve quality of catch on-board fishing vessels through promotion of the reduction of the post-harvest losses. Beneficiaries of this project are mainly small-scale fishing operators and fishery officials who are involving with post-harvest fish handling.

The expected outputs from the project include; data collection on fisheries resources of un-trawlable areas in the Southeast Asian waters; development of the appropriate fish sampling gear and techniques for utilization of the resources in un-trawlable areas of the Southeast Asian waters; and enhancement of human resources capacities of the Member Countries on fishing gear development and post-harvest reduction techniques.

2. PROJECT

2.1 Objectives

- 1) Support the fisheries resource survey, and analyze the potential fisheries resources of economically important species on the un-trawlable areas in the EEZ of the Member Countries using M.V. SEAFDEC 2 and/or other research vessels;
- 2) Carry out R&D on appropriate fish sampling gear and methods for un-trawlable areas of the region;
- 3) Carry out R&D and promote appropriate post-harvest fish technology considering user and environmental friendly including promotion of the hygienic fish handling;
- 4) Improve fish preservation methods/techniques for fishing vessels in SEAFDEC Countries through on-site training programs; and
- 5) Disseminate information on the potential resources on un-trawlable areas.

2.2 Project Description

Activities have been implemented in line with the Resolution (RES) and Plan of Action (PoA) on Sustainable Fisheries for Food Security for the ASEAN Regional Towards 2020 as follow:

RES # 20: Optimise the utilisation of catch from water to market by reducing post-harvest losses and waste to increase fish supply and improve economic returns through promotion of appropriate technologies and facilities along the supply chain”;

PoA # 1 “Integrate the planning of marine capture fisheries, inland capture fisheries and the aquaculture subsectors to promote the sustainable development of the fisheries sector, including harvesting and post-harvest in both capture fisheries and aquaculture;

PoA # 58: Introduce and provide support for the development and application of technologies that optimise the utilisation of catch, reduce post-harvest losses, wastes and discards in commercial and small-scale fisheries and processing operations, through improved processing, facilities and infrastructure development, on-board and on-shore handling, storage, distribution and marketing of fish and fishery products; and

PoA # 63: 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.

Understanding the potential under-utilized fisheries resources and promotion of the resource exploration in a precautionary manner in the Member Countries will be the main focus, in particular the encouragement the Member Countries for utilizing M.V. SEAFDEC 2 for the resources survey. R&D on improvement of catch quality and on-site training program on environmental friendly post-harvest technology onboard fishing vessels has also been implemented in close collaboration with the Member Countries.

As the main activity is also to improve fish handling technology supporting for sustainable utilization of potential fisheries resources and reduction of post-harvest losses on human development program, crystal/slurry ice system has been developed to promote hygiene fish cooling applications at sea. The system uses a vertical shell-and-tube heat exchanger with mechanical heat transfer augmentation, as a dynamic icemaker to generate liquid ice called in various name such as “slurry ice, sherbet ice, flo ice or liquid ice”. The solution consists of small spherical crystal with density about 25~30% surrounded by seawater at subzero temperature. Ice will be formed continuously without accumulation in the heat exchanger and there is compatible with conventional condensing units, storage tanks, and pumps. Seawater is used to produced and formation of crystals, wherever the resulting of liquid ice will able to be pumped or feed to a storage tank. Ice storage hold uses smaller tanks as compared to chilled water. Stored of slurry ice provides consistently low solution supply with its characteristic high evaporator temperatures and high heat fluxes. The slurry ice systems have the potential for significantly lower capital and operating costs than static ice or ice harvesting technologies.

The cooling capacity of slurry ice is approximately 4~6 times higher than utilizing conventional chilled seawater systems. Fully contact between the skin of fish and the cooling media can be made. This causes greater chilling efficiencies having higher rate of heat transfer. The crystal ice is soft and smooth resulting with less damage to the skin of the fish as compared to the use of conventional ice. Rapid chilly is achieved when the small crystals of ice melting and absorbing heat from fish’s skin and surface. In the solutions made of seawater, it melts at a lower temperature than freshwater ice depending on the salt content. Theoretically salt content of seawater average is about 3% by weight. So that slurry ice of seawater will maintain at about -3 to -4 °C, resulting in good condition of the catch both external fresh and odor, the appearance of grill, consistency and extension of shelf life up to 15 days.

In addition, the slurry ice can be used as a basis for saving fuel consumption of the fishing vessels because this system is so-called a thermal energy storage system that storing "heating" or "cooling" energies which were produced form main engine. In practical, slurry ice can be produced on the ways go/back to fishing ground or during fishing operations. Slurry ice will be ready for cooling the catch at all time. By this way, only small amount of ice from shore will be required because the ice can be produced on-board with its own high latent heat released when water freezes (80 Kcal/kg/°C). This can reduce the cost of fish handling and number of crew on-board.

In summary, the training courses on fish handling techniques have been provided by transferring knowledge of fish handle and preservation using simple hygienic handle technique. It includes also chilly ice seawater, refrigeration seawater chilly system, sherbet ice and shelf-life prolongation of high-value fish; fish hold temperature and its improvement. Handle technique and monitoring during transportation will be included to improve fish landed quality. Reduction of the post-harvest losses or utilize the catch of trash fish during storage.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
1.Data collection on fisheries resources	Jan~	Results of the fisheries resource surveys carried out in the EEZ of the Member Countries using M.V. SEAFDEC 2 has been compiled and disseminated through a regional web-based map. This information is now available at SEAFDEC/TD website. (see more information in the document of the project entitled “Development of Regional Database for Fisheries Management”)
	Sep~	Catch data of pelagic fisheries resources obtained during the cruise survey of M.V. SEAFDEC 2 in Vietnam water, from 14 May to 23 July was drafted. The result of the hydro-acoustic survey has been analyzed by Research Institute for Fisheries of Vietnam.
2. R&D on appropriate sampling gears and environmental users friendly fish handling techniques	Sep	A system for demonstration of the sherbet ice generator was developed. Demonstration of the slurry ice system will be made during the training course in TD, scheduled in October 2012. This system will also be used for future activity.
3.Human resource development	Feb	Organization of the on-site training on environmental and user friendly fish handling and preservation technique: slurry ice system on-board fishing boat, in Phu Yen Province, Vietnam, 14 Feb 2012. During the training, demonstration of the slurry ice system was carried out to promote the improvement of post-harvest fish handling.
	Oct	Organization of the training course on post-harvest fish handling techniques, scheduled from 8 to 16 October 2012 at TD. This course is designed for fishery extension officials providing knowledge and experience on fish handling and good practices/applications of such techniques for reduction of the post-harvest losses for small-scale fishing vessels in the region. Contents of the course include: preservation techniques and method for on-board fish handling; cooling medium and its utilization; on-board refrigeration for fish handling; optimization of fuel/power for fish handling; application of fish-handling technologies to reduce post-harvest losses by type of fishing gear and practices on-board fishing vessels; shipboard training (M.V. Plalung); and observation and study trip. It is envisaged that the country can further develop the follow-up training activity based on knowledge obtained from the training course. The project will monitor and follow-up with the country representatives.
4.Information dissemination	Nov~Dec	Training materials for the training activities since 2008 will be packaged.

3.2 Evaluation of the Program Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Sustainable utilization of fisheries resources
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Over-exploitation of the coastal fisheries resources in most of the countries in the region; • Inadequate information for development of fisheries resources in un-trawlable areas in the EEZ of the Member Countries; and

- Low catch quality because of poor handling of fish at sea and also at the landing site, resulting to low market value of the catch.

3.2.2 Expected final goals of the project:

- Information on fishery resources in the un-trawlable areas.
- Improved of the catch quality through promotion of the reduction of the post-harvest losses using appropriate on-board fish handling technique/method.

3.2.3 “Steps” toward achieving final goals:

- Step 1:** Information collection and R&D on fishery resources in un-trawlable areas
- Information collection on the fishery resources in the un-trawlable areas through organization of workshop/meeting and cruise survey by using M.V. SEAFDEC 2;
 - R&D on fish sampling gears appropriate for the un-trawlable areas; and
 - Promote appropriate on-board fish handling techniques/systems.
- Step 2:** Facilitate the estimation of fishery resources in un-trawlable areas, and improve national capacities for reduction of post-harvested losses
- Assist the Member Countries to estimate the fishery resources in un-trawlable areas through the cruise survey of M.V. SEAFDEC 2;
 - Continuation of R&D on appropriate fish sampling gears and techniques for utilization of fisheries resources in the un-trawlable areas; and
 - Support national capacities building through various HRD programs/activities focusing on:
 - Development/use of appropriate fish sampling gears and techniques for the un-trawlable areas.
 - Promote appropriate on-board fish handling technique/method.
- Step 3:** Information exchange and dissemination
- Organization on the workshop/on-site training on the fishery resources;
 - Information sharing with the Member Countries on fisheries resources in un-trawlable areas; and
 - Disseminate key outputs of the project implementation to the Member Countries.

3.2.4 Activities in the current project:

- (1) Current position of the program:** Step 1, 2, and 3
- (2) Project duration:** 2008-2012
- (3) Main activities:**
- Support fishery resources survey, information/data collection, and data analysis;
 - R&D and HRD on appropriate fish sampling gears for un-trawlable areas; and
 - R&D and HRD on the appropriate on-board fish handling technique/method.

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project	
<ul style="list-style-type: none"> • Support surveys, information/data collection, and data analysis; • Suggest appropriate fish sampling gears for un-trawlable areas; and • HRD on the appropriate on-board fish handling technique. 	
(2) Main achievements till the end of 2012	
<ul style="list-style-type: none"> • Support technical and facilities on-board M.V. SEAFDEC2 for pelagic fisheries resources survey in Vietnam water, in collaboration with RIMF and DFISH of Vietnam, totally about 140 days; • Summarizing appropriate fish sampling gears for un-trawlable areas based on the cruise of M.V. SEAFDEC to survey in the EEZ of the Member Countries; and • Organize the regional training course on post-harvest fish handling techniques, scheduled from 8 to 16 October 2012 at TD. 	
(3) Outputs during the project period and expected achievement rate till the end of 2012	
Expected Outputs	Achievement rate (%)
Supporting fishery resources survey, information/data collection, and data analysis	100%
R&D on appropriate fish sampling gears for un-trawlable areas and on-board fish handling techniques	100%
HRD on the appropriate fish sampling gears for un-trawlable areas	100%
HRD on the appropriate on-board fish handling techniques	100%



3.2.6 Evaluation of project activities in 2012:

In early 2012, on-site training on environmental friendly fish handling and preservation techniques was organized in Phu Yen province of Vietnam. Main activity during the training was demonstration of the slurry ice system to promote the improvement of post-harvest fish handling in Vietnam as Phu Yen province is considered a major landing site for tuna and other important pelagic fish.

Two (2) survey cruises using M.V. SEAFDEC 2 for fisheries resources survey has been carried out in Vietnam waters in 2012 during pre- and post-monsoon period. Technical staff of TD provided technical assistance to the Research Institute of Marine Fisheries (RIMF) – Vietnam in preparing the sampling gears (including pelagic fish sampling) for their 5-year program on fisheries resources survey in Vietnam waters starting from 2012 to 2016. The first survey cruise was conducted from 14 May to 23 July 2012. Assessment of the pelagic fisheries resources together with the analysis of the result from hydro-acoustic survey conducted by M.V. SEAFDEC 2 in the water of Vietnam (shallow and deep-sea) was conducted mainly by RIMF. Summary report of the catch sampling data was drafted and to be released. Technical papers of the results from the cruise survey will be jointly produced by SEAFDEC and RIMF. The 2nd cruise survey of M.V. SEAFDEC 2 in Vietnam waters is from 2 October to 13 December 2012.

In October 2012, TD organized the regional training course on post-harvest fish handling techniques targeting at fisheries officials who are responsible for improvement of post-harvest fish handling. It is envisaged that TD could follow-up with the participants of the training in order to ensure the effective implementation of this activity. Noting that this regional activity has been made in responding to the request of Indonesia and Philippines made at the 44th Meeting of SEAFDEC Council in early 2012.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

No activity proposed for 2013 as the project would be completed in 2012.

PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust I: Developing and promoting responsible fisheries for poverty alleviation and food security
Project Title:	Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement
Lead Department:	Training Department
Lead Country:	Thailand
Total Duration:	2010-2014

1. INTRODUCTION

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 the sustainability of, commercial fisheries. It is suggested that the productivity of these ecosystems can be enhanced through human intervention leading to improved livelihoods for coastal communities.

In many areas, the introduction of man-made structures, including artificial reefs, aquaculture facilities, breakwaters, stationary nets and jetties are shown to enhance local populations of aquatic organisms, provided that there are sufficient numbers of structures to have a significant and positive impact on ecosystem productivity and that they are integrated into coastal zone management regimes. These structures can enhance fisheries resources. To optimize the results of such initiatives, careful impact assessment and planning procedures are required.

Re-stocking may be an effective component in the enhancement of marine resources in inshore waters. Juveniles and seeds produced by hatcheries or collected from the wild in other areas are removed rapidly from the ecosystem by destructive fishing gears such as push nets or small-mesh trawl nets. Furthermore, in order to retain the released stocks within the immediate vicinity and minimize losses through out-migration, suitable habitat must be available to them. Therefore, habitat restoration and/or enhancement and establishment of exclusive fishing rights may be necessary prerequisites for any marine re-stocking exercises.

Natural *refugia* play a central role in the sustainability of fisheries. The existence of large-scale natural refuges for population of fished species contributes to the resilience of communities of commercially fished species to the effects of high fishing effort level. The identifying important spawning and nursing grounds of fisheries resources in the established of fisheries *refugia* could help improving management of fisheries.

Immediate action is required 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. These mechanisms are likely to be specific to different stocks and habitats. Habitat creation and the establishment of artificial reefs, the use of fish attraction devices and predator removal all have potential in the region.

2. PROJECT

2.1 Objectives

- 1) Investigate/diagnose the fishery resource status of critical fishing grounds and fishery *refugia* sites;
- 2) Evaluate feasibilities and environmental/socio-economical impacts by resource enhancement practices; and

- 3) Develop regional management approach of coastal fisheries in the rehabilitated habitats in ASEAN Region.

2.2 Project Description

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

The project involves the identification of appropriate resource enhancement tools for the region in order to develop management measure and formulate strategies and guideline through the regional consultative meeting. Regional training programs will be conducted to build up capacity in ASEAN Member Countries for promote sustainable fisheries resources enhancement.

The expected outputs for the project include development of strategies and guide line for implementing resources enhancement program to promote sustainable fisheries resources enhancement, developing human resources in ASEAN Member Countries for the implementation of resources enhancement programs. Project monitoring and evaluation will include annual progress reports, and end-of activity workshops.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Briefly explain major achievements of projects and activities conducted in the year 2012. This section is inapplicable for the newly proposed project.

Activity Title	Duration
<p>1. Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices</p> <p>Sub-Activity 1.2 Information collection on suitable designs of resource enhancement practices including their evaluation and promotion Investigation of existing information and research works on the effective designs/models and methodologies for the resource enhancement tools/practices used in various fisheries habitat were collected. Information collection was conducted through deskwork, and designs/model experiment.</p> <p>The installation of Fish Enhancing Devices (FEDs) (Floating vertical FAD) was conducted on 5-9 June 2012 at artificial reefs site, Rayong province, Thailand. The purpose of installation of FEDs is enhancing the effectiveness of ARs in providing shelter for both demersal and pelagic fish.</p> <p>Sub-Activity 1.3 Workshop/Expert consultation on resource enhancement practices</p> <p>This activity includes workshops as well as expert consultations to identify appropriate and effective resources enhancement tools for various fishery habitats. The activity was postponed to early 2013</p>	<p>June 2012</p> <p>Feb. 2013</p>
<p>2. Technical assistance led by pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds</p> <p>Sub-Activity 2.1 Technical assistance in a pilot site for suitable designs of resource enhancement practices</p> <p>A sequence of survey in the selected onsite study and evaluation on enhancement practices including artificial reefs impact to fisheries resources and environment has been being conducted in Rayong province, Thailand.</p>	<p>June 2012</p>

<p>Recently, the survey study has been conducted during 5-9 June 2012. The survey study included fish species composition inspection by trammel net operations, giant trap operation (hauling and re-setup), juvenile fish trap operation and underwater video recording around the deployed artificial reefs which previously made by DoF of Thailand in 2009. The socio-economic survey to fishermen conducted fishing activities around ARs was conducted through questionnaire.</p> <p>Sub-Activity 2.2 Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management</p> <p>A selected pilot site for the purpose of diagnosing fishing grounds and monitoring the achievements of rehabilitation program in sea grass beds in Krabi Province (Andaman Sea), Thailand was followed up survey during 2-7 April and 27-31 August 2012. Apart from the investigation on the fish species compositions by using juvenile fish traps and trammel net operations, seed releasing of dog conch was simultaneously made in the selected site. Successfully done on the demarcation for conservation area (as agreed by local fisher community) of the Dog conch. Installation of marked buoys in the conservation area of 200x200 m² were completed. New stock of Dog conch of 30,000 seeds were releasing in demarcated area by local fishers and officers concern.</p> <p>Technical assistance in a pilot site for suitable designs of resource enhancement practices has been also extended to Lao PDR. Nam Houm Reservoir was selected as a site for a case study on the identification and evaluation of fisheries ecosystem in the fresh water ecosystem. The following survey was conducted during 23-27 April and 28 July to 4 August 2012 in collaboration with Department of Livestock and Fisheries, Lao PDR and the local fishermen. The survey included the investigation of the fish species compositions by gill net and trammels net operations, fish larvae collection, landing survey and discussion with the local fishermen and fisheries officers. Geographic survey was also initiated in order to assess and obtain the general information of the reservoir's profile.</p> <p>Three kind of hand-on training to local officers and fisher were conducted as following:</p> <ol style="list-style-type: none"> 1) Fish larvae collection by using beach seine net and larvae sample preservation, 2) Fish shelter construction and installation in the fish conservation area, 3) Mobile hatchery demonstration for fish breeding and juvenile fish releasing <p>Sub-Activity 2.3 Capacity building on rehabilitation practices of fisheries resources and habitats/fishing grounds</p> <p>Capacity building on rehabilitation practices of fisheries resources and habitats/fishing grounds would be provided through a training course and study trip to transfer of assistance both in terms of technical and management aspects to Member Countries in order to enhance their capacities and awareness of fishery resources rehabilitation and habitats/fishing grounds practices.</p> <p>The regional Training Course on the identification of Critical Fishing Grounds and habitat Rehabilitation and Management Approach were conducted during 19-28 March 2012 at TD. The objective of the training are 1) To strengthen awareness and knowledge of the participants on the identification of critical fishing grounds and habitat rehabilitation and management approach in the ASEAN Region, 2) To clarify the importance, objectives and establishment of the regional system on critical habitat and fishing ground, 3) To facilitate participants sharing and exchanging experiences and views on the present status of the critical fishing ground, habitat rehabilitation and management approach among Member Countries, and 4) To strengthen the regional network and linkages on the critical fisheries habitat and management plans. There are 15 participants from 7 SEAFDEC Member Countries as followings, Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Thailand and Vietnam.</p>	<p>Apr., Aug. 2012</p> <p>Apr., Jul., Aug. 2012</p> <p>19-28 Mar.</p>
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<p>3. Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region</p> <p>Activity 3.1 Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness</p> <p>Information on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness as outputs from the workshop would be compiled and disseminated to Member Countries. The information gathering during the project site study was reported to the host countries and using as presentation information during the regional training course conducted.</p>	<p>Mar. –Aug.</p>
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3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

<p>(1) Theme: Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds through Resources Enhancement</p>
<p>(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 the sustainability of, commercial fisheries. It is suggested that the productivity of these ecosystems can be enhanced through human intervention leading to improved livelihoods for coastal communities. Immediate action is required 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. These mechanisms are likely to be specific to different stocks and habitats.</p>

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • To optimize the use of fishing ground through resource enhancement programs; • To develop human resources for the implementation of resource enhancement programs; • To develop a guideline for implementing resources enhancement program; • To formulate strategies and action plans in rehabilitating the selected critical fishing grounds; • To enhance cooperation and collaboration among Member Countries to improve capacity building in rehabilitation of the critical fishing grounds; • To provide a guidance on multifaceted fisheries habitat rehabilitation and management to enhance the fishing communities practicing in the importance of harmonization between sustainable fisheries management and environmental concerns; and • To facilitate community’s initiative practicing on the coastal habitat rehabilitation and management particularly through the applicable practice of responsible fisheries in order to achieve sustainable coastal fisheries and environment friendly.
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3.2.3 “Steps” toward achieving final goals:

<p>Step 1:</p> <ul style="list-style-type: none"> • Information survey & method validation; • Case study on selected site in Thailand and Lao PDR; and • Workshop/Seminar
<p>Step 2:</p> <ul style="list-style-type: none"> • Data analysis and evaluation; • Continue case study on selected site; • Workshop/seminar; and • Technical transfer by capacity building to Member Countries

Step 3:

- Evaluation of the impact to resources enhancement methodology;
- Update of Baseline data;
- Continued case study analyses and preparation/submission of reports; and
- Guideline preparation/publication.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 2

(2) Program duration: 2010-2014

(3) Main activities:

- Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices;
- Technical assistance led by pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds; and
- Promotion and extension on rehabilitation of fisheries resources and habitat/fishing grounds in ASEAN Region.

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project

- 1) Investigation / review of the status of critical fishing grounds in the Southeast Asian region;
- 2) Information collection on suitable designs of resource enhancement practices including their evaluation and promotion;
- 3) Workshop/Expert consultation on resource enhancement practices;
- 4) Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach;
- 5) Technical assistance in a pilot site for suitable designs of resource enhancement practices;
- 6) Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management;
- 7) Capacity building on rehabilitation practices of fisheries resources and habitats/fishing grounds;
- 8) Capacity building on identification of critical fishing grounds and on regional habitat rehabilitation and management approach;
- 9) Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness; and
- 10) Regional seminar for end of the project.

(2) Main achievements till the end of 2012 (tentative)

- 1) Investigation/review of the status of critical fishing grounds in the Southeast Asian region;
- 2) Information collection on suitable designs of resource enhancement practices including their evaluation and promotion;
- 3) Workshop/Expert consultation on resource enhancement practices;
- 4) Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach;
- 5) Technical assistance in a pilot site for suitable designs of resource enhancement practices;
- 6) Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management; and
- 7) Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness

(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)

Expected Outputs	Achievement rate (%)
• To optimize the use of fishing ground through resource enhancement programs;	45%
• To develop human resources for the implementation of resource enhancement programs;	50%
• To develop a guideline for implementing resources enhancement program;	45%
• To formulate strategies and actions plan in rehabilitating the selected critical fishing grounds;	40%

<ul style="list-style-type: none"> • To enhance cooperation and collaboration among Member Countries to improve capacity building in rehabilitation of the critical fishing grounds; 	55%
<ul style="list-style-type: none"> • To provide a guidance on multifaceted fisheries habitat rehabilitation and management to enhance the fishing communities practicing in the importance of harmonization between sustainable fisheries management and environmental concerns; and 	45%
<ul style="list-style-type: none"> • To develop a guideline for implementing resources enhancement program. 	60%

3.2.6 Evaluation of project activities in 2012:

The program activities were conducted as proposed schedule. The outcomes of the program activities are obtained as the proposed objectives.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

Planning for the project and activities (project/activity title and its short description) to be implemented as well as expected Outputs in the year 2013. In case that there are linkages among projects, the linkages and coordination mechanism among concerned projects should be provided.

4.1 Planning of the Project Activities

Project/Activity Title	Duration
<p>1. Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices</p> <p>Sub-Activity 1.2 Information collection on suitable designs of resource enhancement practices including their evaluation and promotion</p> <p>Investigation of existing information and research works on the effective designs/models and methodologies for the resource enhancement tools/practices used in various fisheries habitat will be conducted. Information collection would be conducted through deskwork, and designs/model experiment.</p>	May, Sep.
<p>2. Technical assistance led by pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds</p> <p>Sub-Activity 2.1 Technical assistance in a pilot site for suitable designs of resource enhancement practices</p> <p>The selected onsite study and evaluation on enhancement practices including artificial reefs impact to fisheries resources and environment will be continuously conducted in Rayong province, Thailand.</p> <p>Sub-Activity 2.2 Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management</p> <p>The selected pilot study site for the purpose of diagnosing fishing grounds and monitoring the achievements of rehabilitation program in sea grass beds in Krabi Province (Andaman Sea), Thailand will be monitored on the survival and growth rate of released dog conch seeds in the keeping cages as well as the investigation on fish species composition and other organisms.</p> <p>Case studies on the selected priority important fisheries ecosystem identified and evaluated in cooperation with Member Countries in Nam Houm Reservoir, Lao PDR will be continuously conducted including a case study by SEAFDEC on identification and evaluation of fisheries ecosystem.</p> <p>Sub-Activity 2.3 Capacity building on rehabilitation practices of fisheries resources and habitats/fishing grounds</p>	Mar. Jun., Sep. Feb. – Dec. Jun.

<p>Capacity building on rehabilitation practices of fisheries resources and habitats/fishing grounds would be provided through a training course and study trip to transfer of assistance both in terms of technical and management aspects to Member Countries in order to enhance their capacities and awareness of fishery resources rehabilitation and habitats/fishing grounds practices.</p> <p>Sub-Activity 2.4 Capacity building on identification of critical fishing grounds and on regional habitat rehabilitation and management approach</p> <p>This sub-activity has the training course, which will strongly support the transfer of assistance both in term of technical and management aspects to promote the enhancement of fisheries habitat among Member Countries, to improve their capacities in the preservation and rehabilitation of critical fishing grounds and fishery <i>refugia</i>.</p>	<p>Nov.</p>
<p>3. Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region</p> <p>Activity 3.1 Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness</p> <p>Documentation of the best practices of the project implementation and gathered information will be carried out, which can be used as inputs in the preparation of IEC (information, education and communication) materials for dissemination to the Member Countries.</p>	<p>Jan. – Dec.</p>

4.2 Expected Outputs in the Year 2013

<ul style="list-style-type: none"> • To optimize the use of fishing ground through resource enhancement programs; • To develop human resources for the implementation of resource enhancement programs; • To develop a guideline for implementing resources enhancement program; • To formulate strategies and actions plan in rehabilitating the selected critical fishing grounds; • To enhance cooperation and collaboration among Member Countries to improve capacity building in rehabilitation of the critical fishing grounds; • To provide a guidance on multifaceted fisheries habitat rehabilitation and management to enhance the fishing communities practicing in the importance of harmonization between sustainable fisheries management and environmental concerns; and • To develop a guideline for implementing resources enhancement program.
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PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security
Project Title:	Human Resources Development (HRD) Programs on Fisheries Management Approaches for Sustainable Fisheries
Lead Department:	Training Department
Total Duration:	2011-2017

1. INTRODUCTION

As SEAFDEC/TD has been conducted training for the trainer courses with aiming to introduce and disseminate knowledge and technology for improvement of fisheries management for sustainable fisheries to Member Countries in accordance with Member Countries' request. The effective of MCS in combating IUU fishing and the Ecosystem Approach for Fisheries Management that both training courses were conducted at SEAFDEC/TD in the year 2012.

To accelerate in introducing and disseminating trained knowledge and technology to each Member Countries, each Member Countries are expected to conducted follow up domestic training with continue in giving of partly support by SEAFDEC, this with aiming to achieve success to introduce and disseminate of trained knowledge and technology to the domestic training.

On the other hand, comprehensive understanding of the challenges currently facing fisheries resources science and management requires consideration of both the biology and human dimensions. The data collection and statistic information from fisheries activities is the basement of monitoring resources utilization. Fisheries management requires high-quality observations and analysis of the status and dynamics of fish populations. Stock assessment scientists, economists, and social scientists must work with managers to design appropriate methods to collect manage and use accurate and precise biological, economic and social data to accomplish their management responsibilities. These data provide a direct measure of the effectiveness of management and regulations.

A key element of this HRD proposal is to strengthen capability of fishery officers of the Member Countries to implement sustainable fisheries management as well as to strengthen knowledge, skill and techniques of the fishery officer for the Fisheries information improvement such throughout the region.

2. PROJECT

2.1 Objectives

- 1) The understanding of Member Countries on the applicable MCS activities for sustainable fisheries with taking consideration of Ecosystem approaches become more strengthen;
- 2) Member Countries familiar and make use of the cost effective fishery data collection, analysis and sharing system; and
- 3) Difference target groups in the Member Countries strengthen their awareness and their understanding on the fisheries management and sustainable fisheries through the use of the project promotion materials such as posters, cartoon booklets, VCD and etc.

2.2 Project Description

The project will be emphasized to build up/develop human capacity of SEAFDEC Member Countries on fisheries management especially for sustainable fishery in the region. The regional training programs organize and focus on fishery management, ecosystem approach to fisheries and fishery statistics and information as well as relevant issues that support to fisheries management. The promotional materials for raising awareness and strengthen understanding will be developed to build up human capacity and awareness of the target group concern throughout the region.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration
The Regional Training course on Monitoring, Control and Surveillance (MCS) in Combating IUU Fishing in Southeast Asia. The training course was conducted for the period of 12 day SEAFDEC/TD. There were 24 participants from SEAFDEC Member Countries participated in the course.	5-16 March 2012
The Regional Train of Trainers Course on Ecosystem Approach for Fisheries Management. The training course was conducted for 7 days at SEAFDEC/TD, there were 21 participants participated in the training course. The course covered the class lectures/discussion and practical workshop on applicable of knowledge for the participant's individual projects.	16-22 July 2012

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Human Resource Development for Sustainable Fisheries
(2) Issues in the region at the beginning of the study:
<ul style="list-style-type: none"> • Insufficient understanding on the applicable MCS activities for sustainable fisheries with taking consideration Ecosystem approaches; and • Limitation of the techniques and skill on the applicable cost effective fishery data collection, analysis and sharing systems.

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • The concept and principle of MCS and EAF will be applied and made use for the fisheries management in the region • Member Countries strengthened in fishery data collection, analysis, interpret and make use of data sets for fisheries management
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3.2.3 “Steps” toward achieving final goals:

Step 1: Conduct the Regional Train of Trainers Courses on Effective MCS and Ecosystem Approach for Fisheries Management
Step 2: Conduct the Regional Train of Trainers Course on the Applicable Cost Effective on Fisheries Information Gathering and Data Collection for Sustainable Fisheries Management
Step 3: Continue and fellow up in providing technical support to the Member Countries on the Applicable MCS Activities in taking consideration of Ecosystem Approaches for Sustainable Fisheries Management
Step 4: Conduct the mobile fellow up and onsite training activity on Applicable Cost Effective on Fisheries Information Gathering and Data Collection for Sustainable Fisheries Management
Step 5: Production and distribution of promotional materials

3.2.4 Activities in the current project:

(1) Current position of the project: Step 2
(2) Program duration: 2011-2017
(3) Main activities: Training (train of trainers courses and mobile training activities)

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project
<ul style="list-style-type: none"> • Conducted the regional training course on Monitoring, Control and Surveillance (MCS) in Combating IUU Fishing in Southeast Asia. It was conducted from 5 to 16 March, 2012 SEAFDEC/TD. There were 24 participants from SEAFDEC Member Countries participated in the course. • Conducted the regional train of trainers course on Ecosystem Approach for Fisheries management. The

<p>training course was conducted from 16 to 22 July 2012 at SEAFDEC/TD, there were 21 participants participated in the training course. The course covered the class lectures/discussion and practical workshop on applicable of knowledge for the participant's individual projects.</p> <ul style="list-style-type: none"> • Produced of video clips as multimedia training toolkits for the Effective MCS training course. • Translated and published the cartoon booklets on “the story of a boy named POR¹” into Malaysia and Indonesia languages. • Produced the animation cartoon version of “the story of a boy named POR” this which objects to display on the SEAFDEC's website. 	
(2) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)	
Expected outputs/outcomes	Achievement rate (%)
1. Output (recommendation) from the regional workshop on HRD programs need for sustainable fisheries and related counter measures to combat IUU fishing in Southeast Asia (<i>in 2011</i>)	80%
2. The government officers (course participants) be trained in the regional train of trainers course on the course title of <ul style="list-style-type: none"> 2.1 Counter measure to combat IUU fishing (25%) 2.2 Effective of Monitoring, Control and Surveillance (MCS) (25%) 2.3 Ecosystem Approach for Fisheries management (EAF) (25%) 2.4 Applicable Cost Effective on Fisheries Information Gathering and Data Collection for Sustainable Fisheries Management (<i>will conduct in March 2013</i>) 	75%
3. The training toolkit and promotion materials for sustainable fisheries management will be produced	20%

3.2.6 Evaluation of project activities in 2012:

In 2012, two regional training courses were conducted: 1. the Effective MCS and 2. Ecosystem Approaches for Fisheries Management. Base on the courses evaluation 85% of the participants in the effective MCS training course and 90% of the Ecosystem Approach for Fisheries Management training courses fulfilled with their course expectation and the courses objectives.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration
<p>1. Conduct the Regional Train of Trainers Course on Applicable Cost Effective on Fisheries Information Gathering and Data Collection for Sustainable Fisheries Management</p> <p>The training course aims to strengthen knowledge and skill of the participants on the effective fishery information gathering and data collection in coastal small-scale and inland fisheries and also to find out idea to improve the difficulties of fishery information gathering and data collection in each country for future national onsite workshop cum training. The course is planned to be conducted about 5 days in March. Two representatives from each member country will be invited to participate in this course. The course activity is composed of two main components as following: 1). in class: lecture and discussion (4 days) this is to train participants on the effective of fishery information gathering including fishery data collection in coastal small-scale and inland fisheries as well as to encourage participants to make use of the found out information for the sustainable fisheries management. And 2). Practical workshop: A one day practical workshop will be conducted to exchange opinion and information among participants and resource persons on the way forwards to effective fishery information gathering and fishery data collection in each country which will be include the propose activity for</p>	<p>5days (in February to March)</p>

¹ A story of a boy named POR is a cartoon booklet with objective to build up awareness of the readers on the responsible fishing and practices for sustainable fisheries.

<p>the national onsite workshop cum training for improving the fishery information gathering and fishery data collection that will be carried out under collaboration among TD and the selected countries</p>	
<p>2. Mobile onsite training courses on the Applicable MCS activities with taking consideration of Ecosystem Approaches for sustainable fisheries</p> <p>With aiming to make more achievement of the train of trainers courses on the Effective of MCS in combating IUU fishing and the Ecosystem Approach for Fisheries Management that both training courses are conducted at SEAFDEC/TD in the year 2012. The mobile follow up activity is proposed to be carried out in continuing to provide technical support and contribution to the Member Countries, implementing of mobile on-site HRD activities by mainly, the ex-participants from each countries who have been trained in the mentioned train of trainers course at TD with support by SEAFDEC resource person. The proposal will be depend on need requirement of each country and it will be submitted to TD. At maximum three countries will be given technical and advice support in each year of this project period. Base on the mobile onsite-training, these will be implemented in collaboration with the host governments which propose the onsite training activities.</p>	<p>5 days for each mobile onsite training</p>
<p>3. Mobile onsite training courses on Applicable Cost Effective on Fisheries Information Gathering and Data Collection for Sustainable Fisheries Management</p> <p>The onsite training will be implemented, the proposed site/countries for conducting the mobile fellow up and onsite training courses of each year will be adjusted from year by year which base on the countries condition, preparation and requirement. The focal points (participants from the regional train of trainers course on Applicable Cost Effective on Fisheries Information Gathering and Data Collection for Sustainable Fisheries Management will coordinate in their own countries, such as the selection of local participants, translation of basic information and preparation of tailored made training tools and materials, etc.</p>	<p>5 days for each mobile onsite training</p>
<p>4. Production of promotional materials</p> <p>The promotion materials such as posters, cartoon booklets and VCD will be continued to produce in order to enhance and strengthen awareness as well as to buildup understand of the readers for the sustainable fisheries management.</p>	<p>January to December</p>

4.2 Expected Outputs in the Year 2013

<p>The proposed training activities will be effectively conducted and implemented, more than 80% of the participants who involve in each training activity will fulfill with the course objectives.</p>



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust I: Developing and promoting responsible fisheries for poverty alleviation and food security
Project Title:	Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI)
Lead Department:	Training Department
Lead Country:	Vietnam
Total Duration:	2012-2015

1. INTRODUCTION

The Coral Triangle region of Southeast Asia is one of the world's most biologically diverse, economically productive and potentially vulnerable marine zones. As a result of increasing population and exploitation pressures, growing threats from pollution and major ecosystem change there is particular concern in the region, as in the global context more widely, of the untargeted capture of fish species and non-fish species, commonly termed by-catch and discards. Problems associated with by-catch include the capture of juveniles of ecologically important and economically valuable species, non-reporting of retained catches and discarded catches. In some fisheries and regions, there is an increasing trend towards retention of by-catch for use as food for human consumption or for utilization as aquafeed and fertilizer. This is therefore a complex issue, requiring resource and biodiversity issues to be tackled alongside human needs, involving a mix of policy, technical and community support measures.

Building on the successes of the REBYC first phase 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 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. PROJECT

2.1 Objectives

- 1) Promote responsible trawl fisheries that result in sustainable fisheries resources and healthy marine ecosystems in the Coral Triangle and Southeast Asian waters by reduced bycatch, discards and fishing impact on biodiversity and the environment; and
- 2) Encourage/stimulate an effective public and private sector partnership for improved trawl and bycatch management and practices that support fishery dependent incomes and sustainable livelihoods

2.2 Project Description

The follow-up project “*Strategies for trawl fisheries bycatch management (REBYC-II CTI)*” is initiated to mitigate problems associated with bycatch in fisheries located within in the Coral Triangle region of Southeast Asia. This project will be based around multispecies trawling, where bycatch issues are amongst the most serious, with potentially substantial effects on ecosystems and livelihoods. The

project aims to address these challenges by promoting sustainable fishing, encouraging adoption of best fishing practices, and providing a rational approach to delivering benefit from landed bycatch. Specific technological practices will be identified and management plans developed in partnership with the private sector at both national and regional levels, including the preparation of "best practice guidelines for fishing operations".

The project is executed by the governments in the participating countries Indonesia, Papua New Guinea, Philippines, Thailand and Vietnam, in partnership with the private sector and relevant national, regional and international organizations. The Food and Agriculture Organization of the United Nations (FAO) is the Global Environment Facility (GEF) agency for the project, which is funded jointly by GEF and the implementing and executing partners. Financial supports are major allocated by GEF and the governments of the five project countries have confirmed co-financing. The contributions mainly refer to in-kind co-financing from the central fisheries authorities but also include inputs from provincial and local governments and state universities and research institutes. An important part of the government contributions consist of staff time, at central, provincial and local levels. Other items covered include project management costs, some material and equipment for field trials, meetings and surveys. Project co-financing partners including supported by Centre for International Migration and Development (CIM), Swedish International Development Cooperation Agency (SIDA), World Wildlife Fund (WWF) Coral Triangle Programme, Sustainable Fisheries Partnership (SFP), International Fishmeal and Fish Oil Organization (IFFO) and Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP).

SEAFDEC will host and staff the Regional Facilitation Unit (RFU) and provide, in collaboration with the FAO Lead Technical Officer (LTO), the FAO Lead Technical Unit (LTU) locates at FAO-Head Quarter (FAO-HQ), and FAO Regional Office for Asia and the Pacific (FAO-RAP), administrative and technical support to the national fisheries authorities with regard to project implementation. SEAFDEC will also implement regional project activities including support to the development of the regional bycatch policy/strategy, training activities and promotion of standardized methods and approaches (e.g. for data collection) across the region. SEAFDEC will facilitate national-regional-international linkages, including contacts with, inter alia, ASEAN. The institutional arrangements for project implementation provide for the use of existing structures within SEAFDEC allowing for capitalizing on existing partnerships. Regular SEAFDEC staff will assume specific responsibilities under project implementation and SEAFDEC will appoint and finance a Project Technical Advisor who will be responsible for the technical project activities within the RFU as well as project outreach and communication aspects. Figure1 illustrates the implementation arrangements of project.

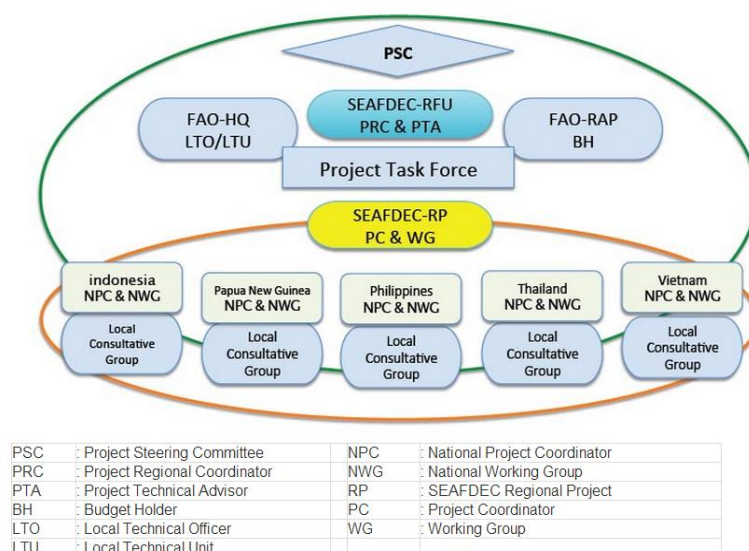


Figure 1: Project implementation arrangements

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
Inception Workshop on “bycatch management and reduction of discards in trawl fisheries”	1-4 May 2012	In collaboration with FAO
Regional workshop on work planning – year1 REBYC-II CTI	6-9 Nov. 2012	Organized under RFU responsibility

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Strategies for Trawl Fisheries By-catch Management
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Existing national and regional policies and strategies for trawl fisheries bycatch management need to be adapted to the current situation of the fisheries resources; • There is limited data on bycatch composition, volumes and the potential impact of trawl fishing on bottom habitats; and • There is inadequate knowledge and awareness of responsible approaches to trawl fishing, and the measures available for improving management and sustainability.

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • An agreed Regional bycatch policy/strategy, in line with the International Guidelines on Bycatch Management and Reduction of Discards, is adopted by at least one relevant organization in the project region and national or area specific trawl fisheries bycatch management plans are adopted covering at least a third of all trawlers in the project countries; • Measures to manage bycatch and reduce discards, and thereby improve fisheries resources, are implemented for 25% of trawl fisheries in all project areas; • In the fisheries covered by improved bycatch management measures, bycatch has been reduced by 20% compared to baseline data to be gathered in year 1; • Incentives for trawl operators to reduce bycatch are defined and implemented in the project areas and best practices communicated within relevant regional frameworks; • Institutional arrangements and processes for public and private sector partnerships are in place and supporting trawl fisheries bycatch management in all project areas; • Standardized data on at least 3 key bycatch (species/sizes) and habitat indicators are available from all project areas and inform trawl fisheries and bycatch management planning and implementation at national and regional levels; • The role of bycatch in trawl profitability is understood and measures for how to ensure long-term economic sustainability of trawl fisheries are identified and incorporated into trawl fisheries bycatch management plans in all project countries; and • Enhanced understanding of responsible fishing by private sector/fishers, fisheries managers and decision-makers are supporting participatory management arrangements in all project countries.
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3.2.3 “Steps” toward achieving final goals:

<p>Step 1: The initial step is strengthened project work plans and standardization of data and information collection and analysis.</p> <ul style="list-style-type: none"> • Preparation of detailed work plan-budget and review of indicators and development of project/activities monitoring tools; • Recruitment/designation of Project Staffs, establishment of Project Steering Committee, National Working Groups, Consultative Groups, management councils as the national level and partnership coordination arrangements are established; • Review/assessment of existing gears and their modifications as well as identification of priorities and methods for surveys and mapping are standardized; • Review/assessment of existing systems, guidelines and related initiatives of existing management of
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<p>fishing capacity, including study of potential incentives will be conducted. The existing data collection systems and identified key indicators for monitoring and evaluation system are reviewed;</p> <ul style="list-style-type: none"> • Appropriate monitoring and evaluation system (combined with Project Management M&E system) will be designed; • Assessment of training needs and capacity building for policy and decision-makers to understand fisheries management, responsible trawl fishing technology and practices is conducted; and • Project website is set up including the preparation and distribution of relevant Information Education and Communication (IEC) materials.
<p>Step 2: Intermediate step is strengthened implementation of trawl fisheries management concepts/plans in the areas covered by the project</p> <ul style="list-style-type: none"> • Assessment on the level of similarity among countries regarding regional bycatch policy/strategy contents and priorities; • Provide more opportunities for experience sharing/learning/discussions among participating countries as required; • Assess need for improved policy, legal and institutional frameworks to support trawl fisheries bycatch management plans including related activities; • Draft regional bycatch policy/strategy and bycatch management plans for trawl fisheries in project areas will be available; • Evaluate the possibilities of fishing and market-based incentives for more responsible fishing and make plans for incentive package implementation. Assess progress towards recommended management measures and finalized incentive packages and ensure their inclusion in trawl fisheries bycatch management implementation; • Assess progress on data collection, verify suitability and cost-effectiveness of methods and choice of indicators and, if needed, adjust the scope and processes for future data collection; and • The awareness and capacity building activities carried out and results compared with expectations and future activities adjusted accordingly as required.
<p>Step 3: Finalization and evaluation on the result, experiences and lessons learnt from the intermediate step activities provides the knowledge to develop appropriate trawl fisheries management at national and regional levels</p> <ul style="list-style-type: none"> • Finalize and agree on a regional policy/strategy; • Support to adoption and implementation of national fisheries bycatch management plans; • Introduction of incentive packages to Consultative Groups/Management Councils; • Appropriate fishing gears and/or practices are individually introduced to participating countries; • Preparation of final recommendations on the implementation of trawl fisheries management, including fishing capacity, spatial and temporal management measures; • Recommendations on appropriate data collection methodologies are provided; and • Project website is functional and arrangements are made to continue production and distribution of relevant IEC materials.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 1
(2) Program duration: 2012-2015
(3) Main activities:

3.2.5 Progress and achievements of the current project:

<p>(1) Main activities conducted in the current project</p> <ul style="list-style-type: none"> • Finalizing the overall project results framework, in order to ensure that there is a common understanding of the project objectives and outputs and of roles and responsibilities among all partners; • Detailing the work plan for year 1st project implementation, both national and regional activities; • Assisting participating countries in preparation of detailed work plan-budget, review of indicators and development of monitoring tools; and • Constructing project website to disseminate and update information of the project as well as initiate the data/information transfer through website.
<p>(2) Main achievements till the end of 2012 (tentative)</p> <ul style="list-style-type: none"> • Project document details on project rationale, project framework, project implementation and management arrangements, financial planning management and project oversight and monitoring;

<ul style="list-style-type: none"> • National and regional plan of the project activities for year 1st project implementation; and • Constructing the website to disseminate and updates information of the project as well as initiate the data/information transfer through website. 	
(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)	
Expected outputs	Achievement rate (%)
• Project document	100
• National and regional plan of the project activities for the year 1st project implementation	100
• Dissemination of project results and related information through the website and publications	100

3.2.6 Evaluation of project activities in 2012:

<ul style="list-style-type: none"> • Participating countries agreed on the overall project results framework, project administration, project oversight and monitoring protocol. <i>Letters of Agreement</i> and <i>Terms of Agreement</i> (or equivalent arrangements) are finalized and signed by participating countries; • Establishment of project administrative structure, <i>i.e.</i> Project Steering Committee, Regional Facilitation Unit and National Working Groups and partnership coordination arrangements; • National and regional project implementation work plans of year 2013, both national and regional activities, are finalized and agreed among participating partners; and • Website and dissemination the information of the project is initiated.
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4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1. Regional Technical Workshop on mapping, information and data requirements	Feb. 2013	If budget available, the 2 nd Regional Technical Workshop will be organized in May 2013
2. Steering Committee Meeting to provided policy guidance and be responsible for approving the annual project work plans	Feb. 2013	Back-to-back program with Regional Technical Workshop
3. Regional Training-cum-Workshop on co-management (including local/community based approaches to responsible fisheries), selective fishing gears and other practices	Jul. 2013	
4. Regional study visit to support the start-up of activities, in particular for the countries that did not participate in REBYC I (Papua New Guinea Thailand and Vietnam)	Jul. 2013	Activity is organized back-to-back program with Regional Training-cum-Workshop if the workshop is able to conduct in Indonesia or Philippines
5. Training Needs Assessments	Oct. 2012 to - Nov. 2013 (Conclusion and Report)	Delay from original plan regarding to the delay of national work plans. Activities will be organized in February and July 2013 together with Project activities 1, 2, 3 and 4.
6. Desk study on Incentives package to support of management plans	Oct.-Nov. 2013	
7. Desk study Policy, legal and institutional framework	Oct.-Nov. 2013	
8. Existing managing fishing capacity framework	Oct.-Nov. 2013	

9. Disseminate Project activities and result	Sept. 2012 to Sept. 2013	
10. Facilitation of national level activities/outputs and consolidation at the regional level	Sept. 2012 to Sept. 2013	

4.2 Expected Outputs in the Year 2013

<ol style="list-style-type: none"> 1. Regional bycatch priorities agreed and bycatch management plans for trawl fisheries in project areas are established and supported by appropriate legislation and institutional arrangements for public and private sector collaboration; 2. Management measures, including environmentally friendly fishing gears and practices that reduce bycatch, discards and the impact on biodiversity and the environment, are identified, developed/adapted and implemented in project areas; 3. Improved data on bycatch and potential fishing ground impact information – collected through standardized methods across all project countries – are available from project areas and inform national/specific area trawl fisheries bycatch management plans; 4. Private sector/fishers, fisheries managers, local governments and other stakeholders have better knowledge on bycatch issues and participate in developing and implementing national/specific area bycatch management plans; 5. Guideline/reference as works shop and training reports, documents and information related with on trawl fisheries management including the indicators to select criteria and recommendations for demarcating fishing zones and areas for spatial-temporal closures, concept of responsible trawl fisheries, selective fishing gears and practices, alternative management approach toward co-management and locally-based approaches (participatory management); 6. Guideline/reference as reports, documents of the study and/or assessment on <ol style="list-style-type: none"> 6.1 Incentives package to support of management plans 6.2 Policy, legal and institutional framework 6.3 Existing managing fishing capacity framework; 7. Drafted plan of year 2014 activities as result of training needs assessments; and 8. Project website, publications and brochures.
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PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security
Project Title:	Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release
Lead Department:	Aquaculture Department
Lead Country:	Philippines
Total Duration:	2010-2014

1. INTRODUCTION

The Southeast Asian region has highly diverse marine flora and fauna. Many aquatic species have been utilized for human food and trade; hence, these are continuously over-exploited especially during the last decades. Consequently, many species in the region became threatened or endangered and some have been listed in CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) which has regulated the capture, collection, trade and utilization of these species. Public concerns in environment protection and marine resource conservation have also increasingly heightened around the world. Immediate actions toward replenishment of the CITES-listed species as well as over-exploited species are needed for securing wholesome ecosystem, which also supports sustainable fisheries inevitable for livelihood in the region.

Stock enhancement including releasing programs is one of the most effective measures to restore the concerned species together with the appropriate fishing regulation. SEAFDEC/AQD has been involved in the stock enhancement project under the financial support of the Government of Japan Trust Fund 4 (TF-4) in 2005-2009. Although not a few precious outcomes such as basic methodologies of seed production, release strategies, *etc.* have been obtained through the project, practical information and technologies on stock enhancement are still lacking in the Southeast Asian countries. Involvement of the fisherfolks in the stock enhancement activities should also be more strongly encouraged because the stock enhancement could not be effective without their understanding and cooperation.

Based on the progress of TF-4 and the up-to-date concept and policies of stock enhancement, more practical approaches need to be implemented to replenish marine resources of internationally threatened and over-exploited species in Southeast Asia. In particular, baseline data collection of the wild stocks, refinement of hatchery and nursery technologies supporting release programs, and community-based management of the resources could be main components. The approaches will contribute both to the worldwide concern on the resource conservation and to their sustainable utilization based on environment-friendly manners with harmonizing the tropical aquatic ecosystem.

2. PROJECT

2.1 Objectives

- 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-based management of the resources and socioeconomic strategies;
- 3) Establish adaptive measures supporting resource enhancement for a changing environment; and
- 4) Disseminate and demonstrate resource enhancement practices.

2.2 Project Description

The Aquaculture Department of SEAFDEC will be responsible for this project and will manage and coordinate all project activities.

The present project will try 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 endeavor of 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 will be 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 not only anthropological repercussion but also 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.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

The outcomes for the third year are summarized as follows: 1) site survey of CITES-listed species, 2) baseline information on regionally over-exploited species and fisheries community, and 3) information on coral-dinoflagellate symbiosis under different environments.

Activity Title	Duration
<p>1. Stock enhancement of internationally threatened species</p> <ul style="list-style-type: none"> • Site-assessment and interview of fisherfolks were conducted at Sitio Matabas, Molocaboc Island, Sagay City and this aimed at the future release program of seahorses. A total of 21 live seahorses were transported from Sagay to Tigbauan Main Station (TMS) SEAFDEC/AQD for genetic analyses as the first batch. For the second batch, wild seahorses were collected from Panal Reef, Sagay Marine Reserve as well, and maintained in the hatchery in TMS for seed production. • A preliminary survey was conducted in Bohol to confirm the presence and distribution of Napoleon wrasse in the reefs of the province. It was confirmed that bigger individuals can only be found in Cabilao Island, Panglao (Arko Point) and Pamilacan Island. In addition, potential zooplankton for Napoleon wrasse larvae were collected in 	<p>Jan-Sep 2012</p> <p>Jan-Sep 2012</p>

<p>estuarine areas of Dumangas, Leganes and San Joaquin. The species such as <i>Brachionus plicatilis</i>, <i>B. rotundiformi</i>, <i>Trochosphaera</i> sp., <i>Acartia</i> sp., <i>Diaphanosoma</i> sp., <i>Tigriopus</i> sp. and some protozoans were identified. Smaller species (<80 microns) were isolated for mass production of the candidate food organisms for Napoleon wrasse.</p>	
<p>2. Stock enhancement of regionally over-exploited species</p> <ul style="list-style-type: none"> • Wild sandfish population in Sitio Daku seagrass meadow showed persistently low to moderate density with small body size, while juveniles released in the monitoring pen in October 2011 showed good growth and survival. The average body weight increased from 35 g to 78g and 100 g in January and March 2012, respectively. Survival was 54% in March (<i>i.e.</i> after 5.5 months after release). The ordinance on size regulation for sandfish in Molocaboc Island has been prepared. • To survey wild and hatchery-reared abalone population, monthly monitoring was implemented using ten 50-m transects, 100 m apart permanently set on the north-eastern side of Carbin Reef. From January 2012, a total of 58 abalone have been collected from all 10 transects. Of these, 98.3% were wild and 1.7% wild released recaptures (recaptured-wild). • In order to get information on baseline assessment in the new site of mud crab wild population, monthly monitoring of mud crab landings in Brgy. Rojas, Iloilo has been implemented. A total of 750 crabs have been collected weighing 89.2 kg and comprised 88.4% <i>Scylla olivacea</i>, 10.4% <i>S. serrata</i> and 1.2% <i>S. tranquebarica</i> as of end of June. • To verify the efficacy of the community-based stock management strategies, monthly monitoring of growth and survival of released stocks in the demo-site was continued as well as activities on information, education and communication (IEC) with community fisherfolk. In addition, abalone cage culture was introduced and planting of sea weed <i>Gracilaria</i> sp., which is a main food for abalone, was continued to develop livelihood and complement stock enhancement management strategies. 	<p>Jan-Sep 2012</p> <p>Jan-Sep 2012</p> <p>Jan-Sep 2012</p> <p>Jan-Sep 2012</p>
<p>3. Establishment of adaptive measures for a changing environment</p> <ul style="list-style-type: none"> • Site assessment for coral community analyses was implemented and the east side of Nogas Island was selected as a site for the study. Temperature data loggers were deployed to monitor temperature at the depth of 5, 10 and 15 m. Coral composition was surveyed with LIT method. Data analyses are on-going. 	<p>Jan-Sep 2012</p>
<p>4. Training</p> <ul style="list-style-type: none"> • Training on sandfish culture was implemented at University of the Philippines Visayas (UPV) and Igang Marine Station (IMS), SEAFDEC/AQD, which accepted 5 trainees from the Molocaboc Barangay Fisheries and Aquatic Resource Management Council (BFARMC). • Training on abalone culture was implemented at TMS, SEAFDEC/AQD, which accepted 5 trainees from the BFARMC. 	<p>20-24 Feb 2012</p> <p>20-24 Feb 2012</p>

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

<p>(1) Theme: Resource enhancement of internationally threatened and over-exploited species in Southeast Asia through stock release</p>
<p>(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.</p>

3.2.2 Expected final goals 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-based management of the resources and socioeconomic strategies;
- To establish adaptive measures supporting resource enhancement for a changing environment; and
- To disseminate and demonstrate resource enhancement practices.

3.2.3 “Steps” toward achieving final goals:

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| <p>Step 1:</p> <ul style="list-style-type: none"> • 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; and • Implementation of training course. |
| <p>Step 2:</p> <ul style="list-style-type: none"> • 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; and • Dissemination of resource enhancement practices. |
| <p>Step 3:</p> <ul style="list-style-type: none"> • Biological and cost assessment for release program, and community-based farming and restocking; • Continuing juvenile production, monitoring for stock releases, assessment of impact of releases, and identification of socioeconomic management strategies; • Development of adaptive measures supporting resource enhancement for a changing environment; and • Workshop/seminar. |

3.2.4 Activities in the current project:

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| (1) Current position of the project: Step 2 |
| (2) Program duration: 2010-2014 |
| <p>(3) Main activities:</p> <ul style="list-style-type: none"> • Stock enhancement of internationally threatened species (species listed in CITES) <ul style="list-style-type: none"> - Stock enhancement of seahorses, <i>Hippocampus comes</i> and <i>H. barbouri</i>; and - Stock enhancement of Napoleon wrasse, <i>Cheilinus sinine</i>⁶⁷ • Stock enhancement of regionally over-exploited species <ul style="list-style-type: none"> - Community managed sandfish <i>Holothuria scabra</i> sea ranching and stock release; - Stock enhancement of donkey’s ear abalone, <i>Haliotis asinine</i>; - Stock enhancement of mud crab, <i>Scylla</i> spp.; and - Socioeconomic analysis and identification of strategies for managing released stocks of abalone and sea cucumber in the Philippines • Establishment of adaptive measures for a changing environment <ul style="list-style-type: none"> - Adaptive measures for coral replenishment • Technology and information transfer on resource enhancement practice through training, publication, and international workshop |

3.2.5 Progress and achievements of the current project:

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| <p>(1) Main activities conducted in the current project</p> <ul style="list-style-type: none"> • To establish resource enhancement strategies of CITES species and regionally over-exploited species; • To establish stable seed production technologies appropriate for release, with genetic consideration; • To develop stock enhancement strategies including site assessment, stock release, and monitoring, taking into consideration impact of release on wild population and other species; • To develop a sustainable utilization and exploitation of natural coastal resources through stock enhancement; • To establish management strategies suitable for adoption in fishing communities through lectures/practices on stock enhancement in Southeast Asia; |
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<ul style="list-style-type: none"> • To monitor changing environments and to establish adaptive measures supporting resource enhancement; • To transfer basic technologies and information on stock enhancement to Member Countries. 	
(2) Main achievements till the end of 2012 (tentative) <ul style="list-style-type: none"> • Molocaboc Is., Sagay Marine Reserve (SMR) was selected as a site for seahorse field activities; wild broodstocks were collected and maintained in the hatchery for seed production; and seahorse tissue samples were collected for genetic analysis; • The potential zooplankton for Napoleon wrasse larvae were collected and identified; and preliminary survey on the distribution of Napoleon wrasse was implemented in different areas in Bohol; • The total number of 1,100 nursery juveniles of parental stock from Molocaboc was transferred; draft of an ordinance on size regulation for sandfish in Molocaboc Island is now on preparation; monitor sandfish population in sea ranching site and vicinity with local partners was implemented; and some broodstock were identified to be F1; • Monitoring of wild and released donkey's ear abalone was continued in SMR; • Monthly monitoring of mud crab landings was implemented in a new site in Barangay Rojas for baseline assessment of wild population; • Broodstocks from Panal Reef in SMR were collected for production of appropriate qualities and quantities of juveniles for further release in the demo-site. Abalone cage culture and planting of <i>Gracilaria</i> to develop livelihoods and complement stock enhancement management strategies were initiated; and • Zooxanthellae have been extracted from tissue samples and currently analyzed by denaturing gradient gel electrophoresis. Temperature data loggers were deployed at depths of 5, 11 and 15 meters at the study site in April, and a continuous record of water temperature is being recorded. 	
(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)	
Expected Outputs	Achievement rate (%)
<ul style="list-style-type: none"> • Mass production technology and broodstock management established; methodology of stock enhancement practice of internationally threatened species (species listed in CITES) developed 	60%
<ul style="list-style-type: none"> • Release strategies of regionally over-exploited species established; effectiveness of community managed sea ranching and socioeconomic strategies verified 	60%
<ul style="list-style-type: none"> • Adaptive measures supporting resource enhancement for a changing environment established 	60%
<ul style="list-style-type: none"> • Resource enhancement practices disseminated and demonstrated 	60%

3.2.6 Evaluation of project activities in 2012:

Procurement of broodstock of Napoleon wrasse is needed to achieve progress of the activity; however, this has not been done in view of difficulty in finding the available stock. Lately, however, alternative trials have also shown certain progresses. Planned studies are considered to be appropriately implemented as a whole in this project.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration
1. Stock enhancement of internationally threatened species (species listed in CITES) <ul style="list-style-type: none"> • Stock enhancement of seahorses, <i>Hippocampus comes</i> and <i>H. barbouri</i> ---- 1) Refine tagging methods on seahorses; 2) Initial release and monitoring of F1 seahorse obtained from the local broodstock captured from Molocaboc Is., Sagay; and 3) Collection of seahorse tissue samples for genetic analysis. • Stock enhancement of Napoleon wrasse, <i>Cheilinus undulates</i> ---- 1) Explore mass culture method of the copepod; 2) Collect and isolate other potential zooplankton species found in the areas, where there are sighting of Napoleon wrasse, for mass production; 3) Site survey and stock assessment at protected and non-protected areas in Bohol; 4) Determine the qualities and types of habitat around the areas; and 5) Awareness campaign in protecting the species to LGUs. 	Jan-Dec 2013

<p>2. Stock enhancement of regionally over-exploited species</p> <ul style="list-style-type: none"> • Community managed sandfish <i>Holothuria scabra</i> sea ranching and stock release ---- 1) Sandfish habitat, fishery and population profiling and monitoring; 2) Advocacy campaign on sea cucumber fishery enhancement; 3) Sandfish hatchery culture and juvenile production in UPV Hatchery; 4) Sandfish stock releases for on-site nursery, then sea ranching. • Stock enhancement of donkey's ear abalone, <i>Haliotis asinina</i> ---- 1) Genetic analysis of wild and hatchery-reared released stocks in a marine protected area, Carbin Reef, Sagay; and 2) Terminal report. • Stock enhancement of mud crab, <i>Scylla</i> spp. ---- 1) Collection of mud crab broodstocks (<i>S. olivacea</i>) from the study site; 2) Conditioning at SEAFDEC Mud Crab Hatchery; 3) Hatchery rearing of crabs for release in the study site; 4) Conditioning of crabs for release; 5) Tagging of crabs for release; and 6) Release of crabs during the later part of 2013. • Socio-economic analysis and identification of strategies for managing released stocks of abalone and sea cucumber in the Philippines ---- 1) Continue monitoring the participation of stakeholders in the community-based resource enhancement demo-site, as well as the overall performance of the released stocks (<i>i.e.</i> growth, survival, regulated quantities of harvests to sustain benefits); 2) Conduct periodic release of hatchery-bred juveniles originating from local stock to sustain harvest and maintain stocks; 3) Continue training and policy advise to support abalone cage culture livelihoods; and 4) Conduct socioeconomic survey to assess compliance to and potential impact of catch size, area and harvest regulations to sustain stock enhancement. 	<p>Jan-Dec 2013</p>
<p>3. Establishment of adaptive measures supporting resource enhancement for a changing environment</p> <ul style="list-style-type: none"> • Adaptive measures for coral replenishment ---- 1) the tank-based temperature experiments shall continue at ambient temperature and the three elevated temperatures; 2) Survival and health of coral fragments shall be monitored and tissue samples will be taken periodically for analysis of zooxanthellae; 3) When coral fragments are identified to be resistant to elevated temperatures, more samples shall be collected and exposed to the elevated temperature to verify the results. Tissue samples will also be taken for analysis; 4) Quarterly video transects by the line-intersect transect method will be recorded; 5) Temperature logging shall continue at the study sites; and 6) Tissue samples will also be collected periodically from the different depths at the study site for analysis of zooxanthellae present. 	<p>Jan-Dec 2013</p>
<p>4. International workshop</p> <ul style="list-style-type: none"> • New information on resource enhancement of internationally threatened and over-exploited species will be presented and discussed by participants from ASEAN Member Countries, resource persons as well as study leaders in this project. Emerging problems that require urgent solutions will also be discussed to pave the way for the promotion of the environment-friendly resource enhancement in the Southeast Asian region. 	<p>Date should be decided</p>

4.2 Expected Outputs in the Year 2013

The envisaged outputs for the fourth year are: 1) refinement of tagging method, mass production of the optimum food organisms and site assessment of CITES-listed species; 2) growth and survival characteristics of wild and hatchery-reared released stocks of regionally over-exploited species; 3) viabilities of stock enhancement, sea ranching and culture practices in a remote, rural fisheries community and local legislation and arrangement regulating fisheries and livelihood; and 4) coral community structure and coral-dinoflagellate symbiont under different environments.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security
Project Title:	Promotion of Sustainable and Region-oriented Aquaculture
Lead Department:	Aquaculture Department
Lead Country:	Philippines
Total Duration:	2010-2014

1. INTRODUCTION

Aquaculture is undoubtedly one of the practical ways for addressing the issues of food security and widespread poverty in the Southeast Asian region. To promote sustainable aquaculture practices, however, several issues should be solved through development of region-oriented technologies and knowledge as follows.

Broodstock and fry needed for aquaculture of high valued species still depend mostly on coastal wild resources. Fishing pressure on them has seriously affected the sustainability of the coastal resources. Domestication and selective breeding of commercially important species would provide stable and reliable supply of quality seeds and thus mitigate the pressure on coastal resources. Particularly, high quality strains obtained through selective breeding are expected to enable small-scale farmers to promote sustainable aquaculture, who are major members in the region.

Most aquaculture practices for commercially-important species necessitate aquaculture feeds, which are highly dependent on wild-caught small marine fish which is usually deemed not suitable for direct human consumption. This has seriously affected the sustainability of coastal fish resources. Improper feeding practices to the cultured species have also led to environmental pollution and degradation. Development of efficient/ low-pollution diets and optimum feeding practices would minimize the negative impacts of aquaculture feeds on the environment. Thus, the development of environment-friendly feeds is crucial to the promotion of sustainable aquaculture in the region.

Intensive aquaculture systems adopted on a large scale aiming to increase production have induced a number of serious problems, including environmental degradation and disease outbreaks, which continue to plague the aquaculture industry in the region. To avoid such problems, we need to design and develop the best farm management techniques in the culture system.

The successful adoption of aquaculture technologies in the ASEAN region may pave the way for livelihood improvement and poverty alleviation of rural communities. However, practical ordinances or policies are still lacking in the level of the local government units, particularly in rural communities. These may constrain the extension and adoption of sustainable aquaculture technologies. To secure livelihood and alleviate poverty in the region, not only technical but also socioeconomic instruction should be implemented.

Specified training focusing on the culture technology of important species such as giant freshwater prawn, mud crab, and black tiger shrimp as well as several marine fish is the pressing need for extending the technologies to the Member Countries to hasten economic development in the region. In addition, to address important role of freshwater aquaculture in providing means of livelihoods and ensuring sustainable food supply to the people particularly in the remote rural areas of Southeast Asia, active promotion of sustainable freshwater aquaculture for rural communities should be undertaken.

The present project including various activities mentioned above will promote sustainable aquaculture and contribute to livelihood improvement and poverty alleviation in the region.

2. PROJECT

2.1 Objectives

- 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 and 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.

2.2 Project Description

The Aquaculture Department of SEAFDEC will be responsible for this project and will manage and coordinate all project activities. Other ASEAN Member Countries, which have been identified as core countries in the project, will be involved in implementing the relevant activities on a cost-sharing basis.

The present project involves five major activities. The first one aims 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. This activity also includes application of genetic monitoring to maintain high genetic variability and identification of possible genetic markers for the selected traits. The development of hatchery technology of emerging species with a pressing need to develop breeding, seed production and culture techniques is 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 is the focus in the second activity. Likewise, surveys of the availability and quality assessment of feed resources in the Philippines and selected developing countries in Southeast Asia (Cambodia, Lao PDR and Myanmar) are conducted. Guidelines on proper feeding management to obtain optimal feed performance and to reduce the negative impacts of improper feeding on the environment are established.

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

The project will analyze 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 are identified.

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

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.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activities on development of selective breeding technology were continued in mud crab, black tiger shrimp, and giant freshwater prawn: selection process at larval and juvenile phases was applied for mud crab; F1 and F2 production of selected strain of black tiger shrimp was performed; and new broodstock management methods were tried for giant freshwater prawn. Effects of administration of triiodothyronine and illumination intensity on larval rearing were studied for Pompano. Acceptability of cowpea meal in diets of giant freshwater prawn was confirmed. The potential use of feed ingredients with plant origin was experimentally assessed. To grasp characteristics of managing technology of aquaculture environment, farm management techniques were compared for shrimp culture. Effects of adoption of sustainable aquaculture technologies on individual undertaking and cooperative venture were analyzed. Apart from the said research activities, three training courses were implemented and two more courses are scheduled in 2012 to enhance region-oriented sustainable aquaculture.

Activity Title	Duration
<p>1. Genetic improvement of commercially important species and development of hatchery technology</p> <ul style="list-style-type: none"> • Mud crab <i>Scylla serrata</i> zoeae were subjected to formalin (0, 20, 30, 40 ppm) stress test for larvae quality evaluation. The same batches of zoeae were also used in the production runs to validate the results. Zoeae from first generation broodstock showed 0, 18.3, 66.7 and 100% cumulative mortality at 0, 20, 30 and 40 ppm formalin, respectively, 3h after exposure. For juvenile quality evaluation, <i>S. serrata</i> were injected with <i>Vibrio harveyi</i> at 10^6, 10^7 and 10^8 cfu*/ml (*Cell Forming Unit), and saline solution as control. After 10 days, cumulative mortality was 0 for both 0 and 10^6 cfu/ml treatments while 47.8 and 93.7% for 10^7 and 10^8 treatments, respectively. Juvenile crabs from three families were stocked in ponds at Dumangas Brackishwater Station (DBS) for growth evaluation and subsequent selection. The experiment is on-going. • Challenge tests were undertaken using <i>V. harveyi</i> for black tiger shrimp <i>Penaeus monodon</i> as well, to get information on F₁ batches to disease. The median lethal concentration of <i>Vibrio harveyi</i> for 2-3 g F₁ juveniles was $3 \times 10^{5.65}$ cfu/shrimp. This dose was used for the challenge test using the 5 first batches of F₁. • New broodstock management methods for giant freshwater prawns <i>Macrobrachium rosenbergii</i>, are being tested: a) frequent male broodstock replacement and b) sex ratio experiment. Data have yet to be analysed after the sixth monthly sampling. • In order to develop hatchery techniques of Pompano <i>Trachinotus blochii</i>, effects of administration of thyroid hormone and illumination on larval rearing were examined. Application of thyroid hormone improved the growth and survival of pompano larvae. Highest growth and survival were observed in 500 lux. 	Jan-Sep 2012
<p>2. Development of environment-friendly feeds using regionally available ingredients</p> <ul style="list-style-type: none"> • Aiming at development of cost-effective and low-pollution aquafeeds, the second feeding experiment for the giant freshwater prawn <i>Macrobrachium rosenbergii</i> in lake-based cages was implemented to reveal the effects of replacement of fish meal with cowpea meal on the growth and survival of post-larvae. The inclusion of up to 45% replacement of fishmeal protein with cowpea meal protein in prawn diets did not produce adverse effect on growth performance. This is consistent with the results of Trial 1, indicating the acceptability of cowpea meal in grow-out diets for <i>M. rosenbergii</i>. • To assess the potential use of feed ingredients from plant origin, digestibility experiment for tilapia in the freshwater phase is on-going. 	Jan-Sep 2012
<p>3. Establishment of managing technology of aquaculture environment</p> <ul style="list-style-type: none"> • Farm management techniques for <i>Penaeus monodon</i> were compared to grasp characteristics of managing technology of aquaculture environment. Pond management strategies identified to give good production are the use of the greenwater culture technique, liming, pond drying/ploughing, less input (such as lower stocking density, no supplementary feeding with commercial pellets) and feeding with natural food. 	Jan-Sep 2012

<p>4. Socioeconomic assessment and impact analysis of transfer and adoption of sustainable aquaculture technologies</p> <ul style="list-style-type: none"> • Through socioeconomic assessment and impact analysis of transfer and adoption of sustainable aquaculture technologies, more interviewees (56%) claimed that aquaculture is better than farming in either Guimaras (representing the marine fishery) or in Dumarao, Capiz, (representing the inland fishery). 	<p>Jan-Sep 2012</p>
<p>5. Technology extension and demonstration</p> <p>1) Abalone hatchery & grow-out (7 participants) In addition to relevant topics related to abalone seed production and grow-out culture, topics on Stock Enhancement of threatened species, and food safety in Abalone Production and Processing were added into the training content. Practical session on planting of seaweeds at IMS was also included in consideration of the comments made by the previous trainees.</p> <p>2) Giant freshwater prawn production training program (7 participants) Production techniques of <i>Macrobrachium</i> spp. were taught through lectures and practicals. The training participants presented a country report on the status of freshwater prawn farming. The training provided an avenue for the participants and AQD resource persons to exchange information and experiences on prawn breeding and farming.</p> <p>3) Marine fish hatchery training program (10 participants) The training course provided participants with experience on the larval rearing of several species of marine fish such as milkfish, grouper, seabass, snapper, pompano, and rabbitfish which timely spawned during the training duration.</p> <p>4) On-site feed preparation training program in Cambodia (<i>in preparation</i>)</p> <p>5) Community-based freshwater aquaculture for remote areas of Southeast Asia (<i>in preparation</i>)</p>	<p>10-30 May 2012</p> <p>18-30 June 2012</p> <p>26 June - 01 August 2012,</p> <p>Nov. 2012 Nov. 2012</p>

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

<p>(1) Theme: Promotion of Sustainable and Region-oriented Aquaculture</p>
<p>(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 parts of 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 for the promotion of sustainable aquaculture in the region but also to have a stable supply of safe aquaculture products in the region.</p>

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • 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 assess and analyze impacts of transfer and adoption of sustainable aquaculture technologies for fisherfolk in the region; and • To disseminate and demonstrate the aquaculture technology.

3.2.3 “Steps” toward achieving final goals:

<p>Step 1:</p> <ul style="list-style-type: none"> • 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;



<ul style="list-style-type: none"> • Gathering information on farm management techniques and best management practices; • Assessment of the socioeconomic impact of the technology transfer and adoption; and • Implementation of training courses, demonstration farm and lecture/seminar.
<p>Step 2:</p> <ul style="list-style-type: none"> • 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 incorporation of 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; and • Transfer of technical through capacity building to Member Countries.
<p>Step 3:</p> <ul style="list-style-type: none"> • 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; and • Workshop/seminar

3.2.4 Activities in the current project:

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

3.2.5 Progress and achievements of the current project:

<p>(1) Main activities conducted in the current project</p> <ul style="list-style-type: none"> • 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; • 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; • To develop farming management strategies that eliminate the risk factors through epidemiological and environmental approaches to prevent and control diseases; • 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; and • To verify and disseminate the project achievements especially in the lesser developed countries in the region through demonstration, training, lecture/seminar and publication activities.
<p>(2) Main achievements till the end of 2012 (tentative)</p> <ul style="list-style-type: none"> • Formalin stress test and challenge test to <i>Vibrio harveyi</i> proved to provide values which could be used as indices of quality evaluation for mudcrab; • F1 broodstocks of black tiger shrimp have been monitored for the selective breeding; • A tank-based experiment on male broodstock replacement was started. A sex ratio trial was started to determine the optimal broodstock sex ratio to increase giant freshwater prawn seed production; • It was proven that pompano gonadal maturation did not follow lunar pattern. Highest growth and survival for larvae were observed in 500 lux. Application of thyroid hormone improved growth and survival of pompano larvae; • Refinement of diet formulation was made to increase the replacement level of fishmeal with cowpea meal up to 60% and to increase the crude protein level in grow-out diets;

<ul style="list-style-type: none"> • Pond management strategies identified to give good production were the presence of mangrove, use of the greenwater culture technique, liming, pond drying/ploughing, less input (lower stocking density, no supplementary feeding with commercial pellets) and feeding with phytoplankton; • Small-scale tilapia growers mostly owning one cage had positive income since they have pre-agreed price and harvest arrangements to minimize competition; and • Three training courses on giant freshwater prawn production, marine fish hatchery, and abalone hatchery were implemented in the first half of 2012; a training course on rural aquaculture will be implemented in the second half of 2012. 	
(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)	
Expected outputs/outcomes	Achievement rate (%)
<ul style="list-style-type: none"> • 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 	60%
<ul style="list-style-type: none"> • To develop environment-friendly feeds for marine fish and crustaceans from regionally available ingredients 	60%
<ul style="list-style-type: none"> • To establish managing technology of aquaculture environment 	60%
<ul style="list-style-type: none"> • To disseminate and demonstrate the aquaculture technology 	60%

3.2.6 Evaluation of project activities in 2012:

Low survivals in black tiger shrimp F2 and experimental animals for new broodstock management in giant freshwater prawn made the progress of activity difficult. However, the study plans are considered to be appropriately implemented as a whole of this project.
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4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration
<p>1. Genetic improvement of commercially important species and development of hatchery technology</p> <ul style="list-style-type: none"> • Selective breeding of mud crabs <i>Scylla serrata</i> The response of crabs to selection on growth, reproductive performance and disease resistance will be evaluated. Reciprocal mating will be done and the performance of the succeeding generations will be compared with the previous generations. • Selective breeding of black tiger shrimp <i>Penaeus monodon</i> Growth of F2 that may be produced will be monitored and compared with the F1 parental stocks to determine if growth rate has improved. • Genetic improvement of giant freshwater prawns <i>Macrobrachium rosenbergii</i> The best broodstock management strategy (reciprocal mating scheme or male broodstock replacement and the appropriate sex ratio) developed and identified in years 2011-2012 will be adopted. • Development of hatchery technology of emerging species Determine optimum spawning conditions for Kikero <i>Scatophagus argus</i> (hormone dosage, and timing). And experiments to improve growth and survival of larvae will be done. 	Jan-Dec 2013
<p>2. Development of environment-friendly feeds using regionally available ingredients</p> <ul style="list-style-type: none"> • Development of efficient and low-pollution diets for grow-out and broodstock (freshwater prawn, milkfish, grouper, mud crab, and black tiger shrimp) The breeding and larval rearing experiments for giant freshwater prawn will be continued. Published articles on the replacement of fishmeal in diets of other species will be reviewed. 	Jan-Dec 2013
<p>3. Establishment of managing technology of aquaculture environment</p> <ul style="list-style-type: none"> • Verification of the management scheme Through small pond trials management schemes during the cold months will be verified. Three extensive <i>P. monodon</i> culture systems will be investigated: 1) Greenwater culture system (GW) with the finfish inside net/bamboo cages inside the shrimp pond; 2) GW with finfish inside reservoir, water used to culture shrimp will come from the reservoir with finfish; and 3) shrimp will be cultured not using the GW. Field trials on the aquasilviculture of <i>P. monodon</i> will be done. Shrimp health in terms of disease occurrence, growth and 	Jan-Dec 2013

survival will be monitored regularly.	
<p>4. Technology extension and demonstration</p> <ul style="list-style-type: none"> • Regional dissemination of black tiger shrimp farming program This training program will extend and disseminate the selective breeding technology in this species. • Marine fish hatchery training program The training course disseminates improved technologies for broodstock management, seed production and grow-out culture of marine fishes such as milkfish, Asian sea bass, groupers, mangrove red snapper, rabbitfish, or pompano to various stakeholders • Abalone hatchery training program This training course aims to provide participants with technical knowledge and skills to operate a hatchery and to manage a grow-out culture of abalone. • On-line course on aquaculture nutrition The 18-week online course will cover nutrient requirements and effects of nutrient deficiencies on aquatic species; feeding behavior, digestive physiology and digestibility; aquafeed formulation, processing, and evaluation; and management and economics of feeding. • Rural aquaculture program This training 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. 	Jan-Dec 2013
<p>5. International workshop</p> <ul style="list-style-type: none"> • International workshop on Sustainable Aquaculture New information on sustainable aquaculture practices will be presented and discussed by participants from ASEAN Member Countries, resource persons as well as study leaders in this project. Emerging problems that require urgent solutions will also be discussed to pave the way for the promotion and have assurance of sustainable aquaculture in the Southeast Asian region. 	Date should be decided

4.2 Expected Outputs in the Year 2013

The envisaged outputs for the fourth year are: 1) selective breeding technologies in mud crab, black tiger shrimp, and giant freshwater prawn, in addition to hatchery technology of kikero, promoted; 2) environment-friendly feeds through replacement of fishmeal in diets promoted, 3) best farm management scheme for shrimp culture to manage technology of aquaculture environment, and 4) several training courses and an international workshop in order to enhance region-oriented sustainable aquaculture implemented.

PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust II: Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade
Project Title:	Chemical and Drug Residues in Fish and Fish Products in Southeast Asia “Biotoxins Monitoring in ASEAN”
Lead Department:	Marine Fisheries Research Department
Lead Country:	Singapore
Total Duration:	2009-2012 (to be extended to 2013-2017)

1. INTRODUCTION

Consumption of a variety of shellfish and fish causes an increasing number of human intoxications around the world. Around 400 poisonous fish species exist and, by definition, the substances responsible for the toxicity of these species are biotoxins. 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 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 of locations. Furthermore, the growing harvest of non-traditional shellfish (such as moon snails, whelks, barnacles, etc) may increase human health problems and management responsibilities (FAO, 2004).

In view of these, MFRD has proposed a project on biotoxins monitoring in ASEAN Countries to increase the attention in expanding and improving initiatives to monitor, detect and share information on marine biotoxins in order to reduce the public health risks associated with the consumption of contaminated shellfish and fish.

The project 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.

2. PROJECT

2.1 Objectives

- 1) Upgrade regional laboratory capabilities and credibility for testing of DSP, PSP and TTX; biotoxins through conduct of a regional training course on methodologies for Member Countries and 1-year survey in Member Countries;
- 2) Establish biotoxins monitoring programmes in Member Countries for routine surveillance testing of fish and fisheries products especially in those countries that do not have such programmes; and
- 3) Improve knowledge and understanding on levels of biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region and facilitate exchange of information among Member Countries by establishing a directory of biotoxins experts and responsible persons/national authorities in each Member Country.

2.2 Project Description

MFRD will be the responsible SEAFDEC Department for the project and will manage and coordinate all project activities.

A Regional Technical Consultation Meeting will be held in Singapore in 2009 to initiate the project and plan for all the project activities. All the ASEAN-SEAFDEC Member Countries will be invited to the meeting and to participate in the project activities. ASEAN-SEAFDEC Member Countries will present country papers on the status of biotoxins monitoring systems in their countries' fisheries industry. A key project leader for each country will be designated to be responsible for implementing and monitoring the project in his/her country. Countries will be identified to conduct surveys in biotoxins detection and monitoring. The meeting also aims to identify the necessary training needs and finalize the details of the training courses to be conducted and the implementation of the survey.

A regional training course involving regional expertise will be conducted in 2010 to build up capacity in ASEAN-SEAFDEC Member Countries for biotoxins detection and monitoring implementation.

ASEAN-SEAFDEC Member Countries will be involved in implementing the relevant project activities on a cost-sharing basis to develop the methodologies in biotoxins analyses in their laboratories. Participating countries will identify specific biotoxins and project sites for monitoring for a 1-year period in 2011. The key project leader will be responsible for implementing and monitoring the progress of the survey in the respective countries.

The expected outputs for the project include development of methodologies of biotoxins analyses, biotoxins survey results, a training course and publication of a technical compilation on biotoxins monitoring in ASEAN.

Project monitoring and evaluation will include annual progress reports, regular monitoring and evaluation of the surveys, and End-of-Project (EOP) Seminar.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
Activity 4: Publication of Technical Compilation	6 months	The participating countries have submitted the results from their Biotoxins survey on a half-yearly basis to MFRD and these results would be included in the final technical compilation at the end of the survey. MFRD is in the process of preparing the Technical Compilation, which is scheduled to be published by end Oct./early Nov 2012.

Activity 5: End-of-Project (EOP) Seminar	2 days	MFRD is in the process of organizing the End-of-Project (EOP) Seminar to conclude the project and to present and disseminate the results of the Biotoxins survey through the Technical Compilation on Biotoxins Monitoring in ASEAN. The EOP is scheduled to be conducted on 20-21 Nov. 2012 in Singapore.
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3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Strengthening the Promotion of Sustainable Fisheries

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

Consumption of a variety of shellfish and fish causes an increasing number of human intoxications around the world. Around 400 poisonous fish species exist and, by definition, the substances responsible for the toxicity of these species are biotoxins. 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 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. (FAO, 2004)

In view of these, MFRD has proposed a project on biotoxins monitoring in ASEAN Countries to increase the attention in expanding and improving initiatives to monitor, detect and share information on marine biotoxins in order to reduce the public health risks associated with the consumption of contaminated shellfish and fish.

3.2.2 Expected final goals of the project:

1. Upgrade regional laboratory capabilities and credibility for testing of DSP, PSP and TTX biotoxins through conduct of a regional training course on methodologies for Member Countries and 1-year survey in Member Countries;
2. Establish biotoxins monitoring programmes in Member Countries for routine surveillance testing of fish and fisheries products especially in those countries that do not have such programmes; and
3. Improve knowledge and understanding on levels of biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region and facilitate exchange of information among Member Countries by establishing a directory of biotoxins experts and responsible persons/national authorities in each Member Country.

3.2.3 “Steps” toward achieving final goals:

Step 1: Regional Technical Consultation Meeting in Biotoxins Monitoring in ASEAN

- Deliberate on the scope of the project which includes the Biotoxins Monitoring Survey and the Technical Compilation;
- Understand the status of biotoxins monitoring system in SEAFDEC Member Countries fisheries industry;
- Identify the biotoxins analysis capabilities in Member Countries; and



<ul style="list-style-type: none"> • Assess the training requirements in biotoxins analysis.
<p>Step 2: Regional Training Course in Biotoxins Analyses</p> <ul style="list-style-type: none"> • To build up capacity in ASEAN Member Countries for biotoxins detection and monitoring implementation; and • To facilitate the setting up of biotoxins analyses methods in ASEAN countries
<p>Step 3: Biotoxins Survey</p> <ul style="list-style-type: none"> • To set up analytical method, identify suitable sampling sites and propose sampling plan for the survey; • To investigate the biotoxins level in ASEAN through the survey conducted by Member Countries; and • To compile the survey results into a Technical Compilation on Biotoxins Monitoring in ASEAN
<p>Step 4: End-of-Project (EOP) Seminar</p> <ul style="list-style-type: none"> • To discuss the results of the Biotoxins survey conducted by Member Countries; • To disseminate the Technical Compilation on Biotoxins Monitoring in ASEAN; and • To discuss the challenges faced during the project implementation and discuss for future projects.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 4
(2) Program duration: 2009-2012
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • To set up analytical method, identify suitable sampling sites and propose sampling plan for the survey; • To investigate the biotoxins level in ASEAN through the survey conducted by Member Countries; and • To compile the survey results into a Technical Compilation on Biotoxins Monitoring in ASEAN.

3.2.5 Progress and achievements of the current project:

<p>(1) Main activities conducted in the current project</p> <ul style="list-style-type: none"> • The Regional Technical Consultation organized in 2009 to deliberate on the project scope, activities and time schedule as well as to provide an overview of biotoxins monitoring systems in ASEAN Member Countries; • Regional Training Course in Biotoxins Analyses conducted in 2010 to build up capacity in ASEAN Member Countries for biotoxins analyses and monitoring; • 1-year Biotoxins Monitoring Survey conducted in 2011; • Technical Compilation on Biotoxins Monitoring in ASEAN published in 2012; and • End-of-Project (EOP) Seminar organized in 2012. 					
<p>(2) Main achievements till the end of 2012 (tentative)</p> <ul style="list-style-type: none"> • The Regional Technical Consultation was successfully held from 26-28 Aug 2009 in Singapore and was attended by ASEAN Member Countries except Brunei Darussalam; • The Regional Training Course in Biotoxins Analyses was successfully conducted in the Toxins Laboratory of the Veterinary Public Health Centre, Agri-Food and Veterinary Authority, Singapore from 28 June- 7 July 2010 for 22 participants from all ASEAN Member Countries; • Member Countries were trained in DSP and lipophilic toxins analysis using HPLC/M/MS, PSP toxins analysis using HPLC, TTX toxins using LC-MS/MS, PSP ELISA rapid method and DSP rapid method. These methods would be useful in assisting countries in setting up their Biotoxins survey; • All ASEAN Member Countries except Brunei have submitted their proposals for the conduct of the biotoxins monitoring survey and have started their survey in January 2011 while Cambodia and Lao PDR commenced their survey in May 2011 and August 2011 respectively; • Participating Member Countries had established their own system to conduct PSP monitoring in Green mussel or Baby clam (Indonesia and Vietnam); • Technical Compilation on Biotoxins Monitoring in ASEAN was prepared and published. It was distributed at the EOP Seminar and also sent to Member Countries; and • EOP Seminar was successfully conducted on 20-21 Nov 2012 in Singapore to conclude the project. 					
<p>(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 60%;">Expected Outputs</th> <th style="width: 40%;">Achievement rate (%)</th> </tr> </thead> <tbody> <tr> <td> Upgrade regional laboratory capabilities and credibility for testing of DSP, PSP and TTX biotoxins through: <ul style="list-style-type: none"> • Conduct of a regional training course on methodologies for Member Countries; and </td> <td style="text-align: center;">100%</td> </tr> </tbody> </table>		Expected Outputs	Achievement rate (%)	Upgrade regional laboratory capabilities and credibility for testing of DSP, PSP and TTX biotoxins through: <ul style="list-style-type: none"> • Conduct of a regional training course on methodologies for Member Countries; and 	100%
Expected Outputs	Achievement rate (%)				
Upgrade regional laboratory capabilities and credibility for testing of DSP, PSP and TTX biotoxins through: <ul style="list-style-type: none"> • Conduct of a regional training course on methodologies for Member Countries; and 	100%				

• Conduct of 1-year survey in Member Countries	
Establish biotoxins monitoring programmes in Member Countries for routine surveillance testing of fish and fisheries products especially in those countries that do not have such programmes	90%
Improve knowledge and understanding on levels of biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region	100%
Facilitate exchange of information among Member Countries by establishing a directory of biotoxins experts and responsible persons/national authorities in each Member Country.	100%

3.2.6 Evaluation of project activities in 2012

All Member Countries, except Brunei, participated in the Biotoxins Survey. Each participating member countries have submitted the results from their Biotoxins Survey, carried out over a one year period, to MFRD for incorporation into the final technical compilation which will serve as a useful reference and resource tool for Member Countries in their efforts to implement biotoxins monitoring. The publication will help to improve knowledge and understanding on levels of biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region and facilitate exchange of information among Member Countries. The EOP Seminar provided a platform for Member Countries to share their experiences and challenges faced in implementing biotoxins monitoring as well as the results of the survey conducted in their respective countries. A network of biotoxins expertise and responsible persons/national authorities in each Member Country has been established and will be built upon.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

Chemical and Drug Residues in Fish and Fish Products in Southeast Asia- Biotoxins Monitoring in ASEAN: ASP, AZA and BTX (2013-2017)

The project from 2013-2017 is an extension of the present project, which has ended in 2012. The new project will 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 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) 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.

Project Objectives:

- 1) Upgrade regional laboratory capabilities and credibility for testing of Amnesic Shellfish Poisoning (ASP), Azaspiracids (AZA) and Brevetoxin (BTX) biotoxins for fish and fisheries products through conduct of a regional training course on methodologies for Member Countries and 1-year biotoxins monitoring survey in Member Countries;
- 2) Establish biotoxins monitoring programmes for ASP, AZA and BTX biotoxins in Member Countries for routine surveillance testing of fish and fisheries products especially in those countries that do not have such programmes; and
- 3) Improve knowledge and understanding on levels of ASP, AZA and BTX biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region and facilitate exchange of information among Member Countries.

Project Description:

MFRD will be the responsible SEAFDEC Department for the project and will manage and coordinate all project activities. Other ASEAN Member Countries will be involved in implementing the relevant project activities on a cost-sharing basis to develop the methodologies in biotoxins analyses. The project duration is 5 years from year 2013 to 2017. The project will involve a Regional Technical Consultation meeting, a Regional Training Course and a monitoring survey, which will result in a technical compilation and an End-of-Project seminar.

The *Regional Technical Consultation*, which is to be held in the *first year* of the project, in the 2nd quarter of 2013, aims to identify the training needs in the individual Member Countries, determine the content of the training course, identify the venue and trainers for the training course, identify the key project leaders and targeted biotoxins for the survey.

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.

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 *final (fifth) year* (2017) will involve a *technical compilation* of the survey results and reports of the Member Countries into a technical publication by MFRD. The publication will be distributed to Member Countries during the *End-of-Project seminar*, which is expected to be held in the 3rd quarter of 2017. The meeting will also discuss the progress achieved in analytical and monitoring capability in Member Countries over the years, the challenges faced and the plans for the future.

Project Activities	1 st year				2 nd year				3 rd year				4 th year				5 th year			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Regional technical consultation		X																		
2. Regional training course						X														
3. Survey									X	X	X	X	X	X						
4. Preparation and publication of Technical Compilation															X	X	X	X		
5. End-of-Project Seminar																				X

4.1 Planning of the Project Activities for the Year 2013

Project/Activity Title	Duration	Remarks
Activity 1: Regional Technical Consultation RTC	3 days	The Regional Technical Consultation (RTC) Meeting will be held in Singapore in the 2 nd quarter of 2013 to initiate the project and plan for all the project activities. All the ASEAN-SEAFDEC Member Countries will be invited to the meeting and to participate in the project's activities. A national key project leader (KPL) for each country will be appointed to be responsible for implementing and monitoring the project activities in his/her country.

4.2 Expected Outputs in the Year 2013

The RTC will initiate the project and plan for all the project activities. The status of biotoxins monitoring in fish and fish products in ASEAN-SEAFDEC Member Countries will be presented through the country papers at the RTC. This will provide a better understanding of biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region. Countries will be identified who are able to conduct surveys in biotoxins detection and monitoring to further improve knowledge on biotoxins occurrences and incidences in fish and fisheries products in the ASEAN region. The meeting will identify the necessary training needs and finalize the details of the regional training course in biotoxins analysis to be conducted and the implementation of the survey. In addition, the meeting will also discuss on the publication of the technical compilation for the survey results and reports.

PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust II: Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade
Project Title:	Traceability Systems for Aquaculture Products in the ASEAN Region
Lead Department:	Marine Fisheries Research Department
Lead Country:	Singapore
Total Duration:	2010-2014

1. INTRODUCTION

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 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.

2. PROJECT

2.1 Objectives

- 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.

2.2 Project Description

MFRD will be the responsible SEAFDEC Department for the project and will manage and coordinate all project activities.

A Regional Technical Consultation will be organized for ASEAN Member Countries to provide an overview on implementation of traceability systems for aquaculture products in their countries and to discuss on the project and its activities. Two on-site training workshops on traceability systems for aquaculture products will be conducted by regional expertise with participating countries and commercial co-operants. The on-site training workshops will cover traceability systems for aquaculture fish and shrimp. The expected outputs of the project include on-site training workshops and publication of the technical compilation on implementation of traceability systems for aquaculture products in the ASEAN region.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
Activity 3: Mid-Term Project Review Meeting	2 days	MFRD will organize a Mid Term Project Review Meeting on 7-8 Nov 2012. The meeting will review the progress of the project and the activities conducted thus far. As the meeting serves as a platform for the sharing of information and experiences, the participants will also provide updates on the implementation status of traceability systems for aquaculture products in their respective countries and any national activities conducted. The meeting will also discuss and plan for the 2 nd on-site regional training workshop to be held in 2013 in Thailand.

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Traceability systems for aquaculture products

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

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 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.

3.2.2 Expected final goals of the project:

- 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
- Enhance regional capability on implementation of traceability systems for aquaculture products and promote their implementation in the region

3.2.3 “Steps” toward achieving final goals:

Step 1: Regional Technical Consultation in Traceability Systems for Aquaculture Products in ASEAN Region

- Deliberate on the scope of the project which covers technical compilation on traceability systems for aquaculture products in the ASEAN region and onsite training on traceability systems for aquaculture products;
- 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; and
- Identify suitable sites for the on-site training on traceability systems for aquaculture products (fish farm and shrimp farm) with suitable co-operants.

Step 2: Regional On-site Training Workshops on Traceability Systems for Aquaculture Products in ASEAN Region

- To build up capacity in ASEAN Member Countries for knowledge in traceability systems for aquaculture products; and
- To facilitate implementation of traceability systems for aquaculture products for interested parties from ASEAN Member Countries.

Step 3: Mid-Term Project Review Meeting

- To review the progress of the project and activities conducted;
- To provide an update on the implementation status of traceability systems for aquaculture products in the ASEAN Region; and
- To discuss on the future project activities.

Step 4: Documentation and Publication of Technical Compilation

- To prepare and compile technical information on traceability systems for aquaculture products in ASEAN region. The technical information will include implementation guidelines, challenges faced and benefits of implementing traceability systems for aquaculture products.

Step 5: End-of-Project Seminar

- To conclude the project and provide a final update on the implementation status of traceability systems for aquaculture products in the ASEAN Region;
- To disseminate the Technical Compilation on traceability systems for aquaculture products in ASEAN region; and
- To discuss the challenges faced during the project implementation and discuss possible future projects.

3.2.4 Activities in the current project:

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

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project	
<ul style="list-style-type: none"> • The Regional Technical Consultation on Traceability Systems on Aquaculture Products in the ASEAN Region in 2010; • 1st Regional On-site Training Workshop on Traceability Systems for Aquaculture Fish in ASEAN Region in 2011; and • Mid-Term Project Review Meeting in 2012. 	
(2) Main achievements till the end of 2012 (tentative)	
<ul style="list-style-type: none"> • The RTC Meeting was successfully conducted held from 12-14 October in Singapore. The meeting decided on all the project activities and time schedule. The meeting agreed to conduct the 1st on-site workshop on traceability systems for aquaculture fish in Vietnam in 2011 and the 2nd on-site workshop on traceability systems for aquaculture shrimp in Thailand in 2013; • The 1st 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 Countries. 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; and • 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 2nd on-site regional training workshop to be held in 2013 in Thailand. 	
(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)	
Expected Outputs	Achievement rate (%)
<ul style="list-style-type: none"> • 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. 	60%
<ul style="list-style-type: none"> • Enhance regional capability on implementation of traceability systems for aquaculture products and promote their implementation in the region. 	30%

3.2.6 Evaluation of project activities in 2012:

In 2012, being the halfway point of the project, the Mid-Term Project Review Meeting provided an opportune platform for a timely review of the progress of the project and activities conducted. Member Countries provided status updates on the implementation of traceability systems for aquaculture products in their respective countries including national activities, issues and challenges faced. The meeting also

deliberated on the 2nd on-site regional training workshop on traceability systems for aquaculture shrimp to be held in Thailand in 2013 taking into consideration the recommendations of the 1st regional on-site training workshop in 2011 to ensure that the training will be more effective and beneficial to the participants of the workshop.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 2.2: 2nd Regional On-site Training Workshop on traceability systems for aquaculture shrimp	3 days	On-site training on traceability systems for aquaculture shrimp is scheduled to be held in Thailand in 3 rd quarter 2013. The 3-day training program which will include lectures and site visits to a shrimp aquaculture farm and a processing factory where the shrimps are processed to enable the participants to learn how traceability is implemented throughout the whole production chain.
Activity 4: Documentation and publication of technical compilation	6 months	Preparation of the technical compilation on traceability systems for aquaculture products in the ASEAN Region will begin after the on-site workshop and scheduled for publication in 2014. It will incorporate the information and data from the two on-site workshops and include implementation guidelines, difficulties faced and benefits of implementing traceability systems for aquaculture products.

4.2 Expected Outputs in the Year 2013

The on-site training workshop will provide the participants with a better understanding and knowledge on implementation of traceability systems for aquaculture shrimp to better equip them to establish such systems in their respective countries. The technical compilation on traceability systems for aquaculture products in the ASEAN Region when published in 2014 will serve as a useful resource for Member Countries to assist in their implementation of traceability systems for aquaculture products. Product traceability has become a major concern of the aquaculture industry as it has become a legitimate requirement in major international and regional markets. These two activities will thus help to achieve the project's objective to enhance regional capability in 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

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust II: Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade
Project Title:	Utilization of Freshwater Fish for Value-added Products
Lead Department:	Marine Fisheries Research Department
Lead Country:	Singapore
Total Duration:	2011-2013

1. INTRODUCTION

Freshwater fish is an important fisheries resource in many ASEAN Member Countries where it serves as a major source of animal protein especially for the marginalized and poorer segments of the population thereby contributing to food security in these countries. Freshwater fish is also an important source of raw materials for processing into a variety of traditional fish products in the ASEAN Member Countries.

Freshwater fish products as with other traditional products in the ASEAN region are largely processed by household producers and small and medium-sized establishments which are usually family-owned operations with little mechanization. Upgrading of processing and packaging technology for the freshwater fish products will help to improve their quality and safety with the possibility of commercialization.

With Lao PDR, Cambodia, Myanmar and Vietnam becoming members of SEAFDEC, freshwater fish utilization is becoming an important area to study as these Member Countries have significant freshwater fisheries. Under the previous SEAFDEC Special 5-year Programme (2001-2005), MFRD conducted a project on utilization of freshwater fish with Cambodia in 2003-2004. However, MFRD was not able to extend the project to the other countries due to budget constraints. Singapore through its Post-Harvest Division (PHD) of the Agri-Food and Veterinary Authority (AVA) as the Collaborating Center for MFRD programmes, is proposing to conduct a one-year project each with Laos, Myanmar and Vietnam on utilization of freshwater fish using the MFRD Other Fund.

The project is in line with the following resolution and plan of action as endorsed at the ASEAN-SEAFDEC Conference of 2011:

Resolution 20: Optimise the utilisation of catch from water to market by reducing post-harvest losses and waste to increase fish supply and improve economic returns through promotion of appropriate technologies and facilities along the supply chain.

Plan of Action D58: Introduce and provide support for the development and application of technologies that 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.

2. PROJECT

2.1 Objectives

- 1) To utilize freshwater fish species for the development of value-added products; and
- 2) To assist in upgrading the processing and packaging technology for freshwater fish products

2.2 Project Description

The Post-Harvest technology Division (PHTD) 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 funded using the MFRD Other Fund and will be on a cost-sharing basis with the following countries: Lao PDR, Myanmar, Vietnam and Indonesia (following the request made by Indonesia at the 42nd Meeting of the SEAFDEC Council held in Luang Prabang, Lao PDR from 5 to 9 April 2010).

The project will be implemented through the following six activities over 3 years from 2011 to 2013:

- 2011: Activity 1: Project Inception and Planning Meeting
 Activity 2: Regional Training Course on Processing of Value Added Products
- 2012: Activity 3: Product development and processing trials
 Activity 4: Mid-term Evaluation and Progress Meeting
- 2013: Activity 5: Preparation and Publication of the Processing Handbook
 Activity 6: End-of-Project Seminar

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
Activity 3: Product development and processing trials	1 year	Each participating country has conducted product development and processing trials to develop value added products using the indigenous freshwater fish species that was agreed at the Project Inception and Planning Meeting. Shelf-life studies on the products were also conducted.
Activity 4: Mid-term Evaluation and Progress Meeting	2 days	A 2-day Mid-term Evaluation and Progress Meeting was successfully organized and conducted by MFRD on 27-28 Jun 2012 to discuss and evaluate the progress of the project and to plan for the subsequent activities <i>i.e.</i> the preparation and publication of the processing handbook and the End-of-Project Seminar.

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Utilization of freshwater fish species for value-added products
(2) Issues in the region at the beginning of the study: Freshwater fish is an important fisheries resource in many ASEAN Member Countries where it serves as a major source of animal protein especially for the marginalized and poorer segments of the population thereby contributing to food security in these countries. Freshwater fish is also an important source of raw materials for processing into a variety of traditional fish products in the ASEAN Member Countries. Freshwater fish products as with other traditional products in the ASEAN region are largely processed by household producers and small and medium-sized establishments which are usually family-owned operations with little mechanization. Upgrading of processing and packaging technology for the freshwater fish products will help to improve their quality and safety with the possibility of commercialization. With Lao PDR, Cambodia, Myanmar and Vietnam becoming members of SEAFDEC, freshwater fish utilization is becoming an important area to study as these Member Countries have significant freshwater fisheries.

3.2.2 Expected final goals of the project:

- To utilize selected freshwater fish species for the development of value-added products in participating countries; and
- To assist in upgrading the processing and packaging technology for freshwater fish products.

3.2.3 “Steps” toward achieving final goals:

Step 1: Project Inception and Planning Meeting

- To discuss and plan for all project activities and time schedules;
- To identify the freshwater fish species to be utilized and the types of value-added products to be developed;
- To provide a better overview and understanding of the freshwater fisheries resources as well as the traditional freshwater fish products in the participating countries; and
- To identify the key project leader in each country and commercial co-operants, if any, for the project.

Step 2: Regional Training Course in Processing of Value Added Products

- To provide project participants with the knowledge and skills in processing, packaging and product development of freshwater fish products using simple, inexpensive equipment and technology suitable for the village level and small to medium-sized industry; and
- Good manufacturing and handling practices to ensure product safety and quality will also be emphasized in the course.

Step 3: Product development and processing trials

- Each participating country to conduct product development and processing (including packaging) trials to develop 2-3 value added products using selected freshwater fish species; and
- Shelf-life studies on the products should also be conducted

Step 4: Mid-term Evaluation and Progress Meeting

- To discuss and evaluate the progress of the project; and
- To plan for the subsequent activities *i.e.* the preparation and publication of the processing handbook and the End-of-Project Seminar.

Step 5: Preparation and Publication of the Processing Handbook

- **A handbook on the processing of the value-added products developed by each of the country using the freshwater fish species will be prepared and published. Five hundred copies of the handbook will be printed.**

Step 6: End-of-Project Seminar

- To share the results of the project with the other ASEAN Member Countries;
- To disseminate the handbook on the processing of the value-added products; and
- To discuss the challenges faced during the project implementation and discuss possible future projects.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 4

(2) Program duration: 2011-2013

(3) Main activities:

- Project Inception and Planning Meeting;
- Regional Training Course in Processing of Value Added Products;
- Product development and processing trials;
- Mid-term Evaluation and Progress Meeting;
- Preparation and Publication of the Processing Handbook; and
- End-of-Project Seminar

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project

- The Project Inception and Planning Meeting held in Singapore in 2nd quarter of 2011;
- The Regional Training Course on processing of value added products using freshwater fish conducted in MFRD/Singapore in the last quarter of 2011;
- The product development and processing trials using indigenous freshwater carried out by the participating countries in 2012; and

<ul style="list-style-type: none"> • The Mid-term Evaluation and Progress Meeting held in Singapore in 2012. 							
<p>(2) Main achievements till the end of 2012 (tentative)</p> <ul style="list-style-type: none"> • The 2-day Project Inception and Planning Meeting was successfully held in Singapore on 26-27 Apr 2011. The meeting discussed and planned for all the project activities and project schedule, appointed the key project leaders and identified commercial co-operants in the participating countries, identified the freshwater fish species to be utilized and the types of value-added products to be developed by the participating countries. The meeting also deliberated on the product development and processing trials to be conducted in the participating countries as well as the publication of the processing handbook on the products developed; • MFRD successfully organized and conducted the 4-day Regional Training Course on processing of value added products using freshwater fish from 18 to 21 Oct 2011 to equip the project participants with the knowledge and skills to develop their value added products using simple, inexpensive equipment and technology suitable for the village level and small to medium-sized industry. The training course included lectures and hands-on practicals on the processing of six value-added products, which has been agreed to at the Project Inception and Planning Meeting. There were also lectures on GMP and HACCP in fish processing, shelf-life studies on fish products and a practical on sensory analyses; • The participating countries have conducted product development and processing trials for value added products using the indigenous freshwater fish species agreed at the Project Inception and Planning Meeting, two products each for Indonesia, Myanmar and Vietnam and 1 product for Lao PDR. In addition, the countries have conducted shelf-life studies on the value added products developed and • The Mid-term Evaluation and Progress Meeting was successfully held in Singapore on 27-28 Jun 2012 and was attended by 2 participants from each of the participating countries of Indonesia, Myanmar, Lao PDR and Vietnam. Each country presented the status and results of their product development and processing trials. A sensory evaluation on the products made by the individual countries was also conducted to provide valuable feedback for product improvement. The meeting agreed that the product development and processing trials (including product shelf life studies) should be completed by end of 2012 with all the reports submitted to MFRD by 1st quarter of 2013. 							
<p>(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)</p> <table border="1"> <thead> <tr> <th>Expected Outputs</th> <th>Achievement rate (%)</th> </tr> </thead> <tbody> <tr> <td>To utilize freshwater fish species for the development of value-added products</td> <td>80</td> </tr> <tr> <td>To assist in upgrading the processing and packaging technology for freshwater fish products</td> <td>60</td> </tr> </tbody> </table>		Expected Outputs	Achievement rate (%)	To utilize freshwater fish species for the development of value-added products	80	To assist in upgrading the processing and packaging technology for freshwater fish products	60
Expected Outputs	Achievement rate (%)						
To utilize freshwater fish species for the development of value-added products	80						
To assist in upgrading the processing and packaging technology for freshwater fish products	60						

3.2.6 Evaluation of project activities in 2012:

The participating countries have successfully developed value added products using their indigenous freshwater fish species following the training received at the regional training course in 2011. Indonesia has developed 2 products from catfish, Myanmar – 2 products from rohu fish, Lao PDR – 1 product from clown featherback fish and Vietnam – 2 products from catfish and snakehead fish. The Mid-term Evaluation and Progress Meeting was a useful platform for the participating countries to share information and results of their product development and processing trials as well as shelf life studies to help in product improvement.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 5: Preparation and Publication of the Processing Handbook	5 months	MFRD will prepare and publish a handbook on the processing of the value-added products developed by each of the participating country using freshwater fish species. The handbook will contain information on the products, ingredients used, processing steps and flow charts, costing and shelf-life studies.



Activity 6: End-of-Project Seminar	2 days	An End-of-Project Seminar will be conducted in Singapore to share the results of the project among the countries. The processing handbook will be introduced and distributed at the Seminar. The value-added products will also be prepared for tasting at the seminar. Three participants from each country will be invited to attend of which at least one should be from the private sector.
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4.2 Expected Outputs in the Year 2013

MFRD will prepare and publish a handbook on the processing of the value-added products by each of the participating countries. Five hundred copies of the handbook will be printed and distributed to all ASEAN-SEAFDEC Member Countries to share the results of the project and to serve as a useful resource on using freshwater fish to make value added products. At the End-of-Project Seminar, MFRD shall facilitate to invite interested Singapore companies to attend to provide opportunities for networking with the project's commercial co-operants, which may lead to business opportunities.

PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust II: Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade
Project Title:	Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia
Lead Department:	Aquaculture Department
Lead Country:	Philippines
Total Duration:	2010-2014

1. INTRODUCTION

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. To meet the various standards required by the global market is also a growing pressure for developing countries. Better understanding of the risks, impacts and management problems related to diseases is important because the quality greatly affects the commodity's chance for export. Better understanding of issues affecting disease occurrences and their control can promote the livelihood of small holders and aquafarmers, especially in rural communities.

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, but also the urgent acceleration of awareness and capacity building in fish health management in the Southeast Asia region. The latter would provoke small farmers and family-based enterprises composing a large sector of aquaculture in the region to bring interest on fish health issues linking to the increases of productivity and food safety. Additionally, training and skills' development for researchers in counterpart countries on *in-situ* samplings and disease identification should be promoted until such time that they can do the work independently.

Of the technical aspect, establishment of preventive management strategies is needed to maintain the disease-free status of fish stocks. This will enable the aquafarmers to strictly monitor the health status so that early and effective intervention strategies can be implemented. The necessity to establish new methods to prevent fish disease, other than chemotherapy, is also increasing worldwide so as to guarantee food safety. Vaccine delivery by injection is not practical under field conditions. Immersion and oral administration have shown efficacy but the fate of the vaccine after uptake by epithelial and mucosal tissues and the duration of the protective response are uncertain. The study on the vaccine carrier, therefore, would be very important to increase productivity and food safety.

Regarding parasitic diseases, especially the study and expertise on mollusk diseases are yet very scarce in spite of the increasing economic importance of these species. In addition, as for economically important freshwater fish species used as food fish, the fish-borne zoonotic parasites have not been fully investigated in Southeast Asian countries, especially Cambodia, Lao PDR and Myanmar. Thus, implementation of parasite studies should be undertaken.

The present project focuses on the acceleration of delivery of information and awareness-building among the aquafarmers as well as on research and technology development which remain as significant activities of SEAFDEC/AQD. An integrated fish-health-care system and management strategies expected to be established through this project will ensure a holistic approach to a stable supply of safe aquaculture products.

2. PROJECT

2.1 Objectives

- 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 the outputs of the project.

2.2 Project Description

The Aquaculture Department of SEAFDEC will be responsible for this project and will manage and coordinate all project activities.

SEAFDEC/AQD initiated the Fish Disease Projects by Japanese Trust Fund in response to many request for intensive research in fish health problems. 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. Particularly, 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.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

The outcomes for the third year are summarized as follows: 1) information dissemination on primary aquatic animal health care through AQUA-Health Online training course; 2) on-site seminars on fish health management and survey on parasite fauna of freshwater in Cambodia; 3) optimization of q-PCR protocols for WSSV, IMNV, RSIV, KHV and VNN; 4) demonstration of betanodavirus-neutralizing antibody titer in eggs and newly-hatched larvae and determination of the duration and degree of

protection conferred by maternal antibodies in offspring in sea bass and pompano; 5) clarification of antibacterial and antiviral properties of the extract from ulva; 6) evaluation of various booster vaccination schemes; 7) the pathogenicity of shell-boring polychaetes and screening of parasites in different stages of hatchery-reared abalone and from the wild; and 8) implementation of International Workshop on fish health management.

Activity Title	Duration
<p>1. Accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building</p> <ul style="list-style-type: none"> • Aquahealth Online Course (AHOL) started on the second week of September and will continue until mid February 2013. Participants are from SEAFDEC Member Countries. In late October, another training course focusing on freshwater fish health management and zoonotic pathogens will be conducted in Cambodia in conjunction with the farmer's survey. The survey has a purpose to document their farming practices and fish health awareness; and • Survey on freshwater fish samples from Regions VII (Cebu), X (Bukidnon) and XI (Davao) was conducted for the zoonotic parasites analysis. Tissue samples of tilapia were collected from Calawan, Laguna for the analysis of fishborne zoonotic parasites. Results showed that no fishborne zoonotic metacercariae was recovered in all fish tissues. 	<p>Sep 2012-Feb 2013</p> <p>Jan-Sep 2012</p>
<p>2. Innovative research to guarantee food safety and sustainable production</p> <ul style="list-style-type: none"> • Development of WSSV plasmid positive control was conducted as standard in the conventional PCR and q-PCR. Positive clones were analyzed using colony PCR and clones with insert were stocked in -80°C. The same procedure was followed in the development of plasmid positive controls for RSIV and KHV. The development of plasmid positive control for other shrimp and fish viruses is on-going. Optimization of q-PCR protocols for WSSV, IMNV, RSIV, KHV and VNN with KAPA SYBR FAST Master Mix Universal using infected muscle tissues and supernatant of virus-infected cell line were already completed while the plasmids will follow; • Over the past five years (2007-2012), closer inspection of the trend of the kinetics of betanodavirus-neutralizing antibody productions in sea bass broodstocks revealed that annual booster vaccination actively propelled the mounting of potent anamnestic immune responses in these fish against NNV infection. In addition, the absence of NNV in milts and eggs obtained from vaccinated fish and the resultant absence of NNV coupled with the presence of neutralizing antibodies in the spawned eggs, respectively, clearly indicate that the vaccinated sea bass broodstocks are NNV free, and that these immunocompetent fish were able to successfully transmit NNV-neutralizing antibodies to their offspring; • The preliminary results obtained through intramuscular challenge of pompano juveniles previously injected with <i>Ulva pertusa</i> aqueous extracts on the <i>in vivo</i> efficacy against <i>Vibrio alginolyticus</i> infection indicate the potential use of <i>U. pertusa</i> extracts as prophylactic/therapeutic agent against VNN in pompano juveniles; • Oral administration of the vaccine, recombinant VP28 Inclusion Body (IB) proteins and plasmid DNA vaccine, followed by immersion experimental challenge showed that cumulative mortality recorded daily for 15 days was markedly lower for the IB+chitosan group. This shows the potential of chitosan as carrier for recombinant VP28 IB protein vaccine and • Different stages of abalone were collected at SEAFDEC/AQD Abalone Hatchery. Histological results for the presence of parasites showed that ciliates (prevalence, 14 %) were found in the gills and digestive gland. Metazoan parasites (prevalence, 10 %) were seen in sections of multicellular organisms clearly visible within the foot surfaces. 	<p>Jan-Sep 2012</p> <p>Jan-Sep 2012</p> <p>Jan-Sep 2012</p> <p>Jan-Sep 2012</p> <p>Jan-Sep 2012</p>
<p>3. International Workshop</p> <ul style="list-style-type: none"> • International Workshop on Fish Health Management “Accelerating Awareness and Capacity-Building in Southeast Asia” was held at Iloilo City, Philippines. The meeting gathered 222 participants from local and regional areas. The workshop identified issues and gaps; provided provide updates on novel fish health management, and optimized the ability of both fish health practitioners and aquaculturists. Originally this workshop was scheduled in 2011; however this postponed to March 2012, because of heavy schedule in 2011. 	<p>01-02 Mar 2012</p>

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Accelerating awareness and capacity-building in fish health management in Southeast Asia

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

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. 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, but also the urgent acceleration of awareness and capacity building in fish health management in Southeast Asia.

3.2.2 Expected final goals of the project:

- 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;
- To investigate fish-borne zoonotic parasites of commercially important freshwater fish and its diagnosis, pathology and host-parasite relationship;
- 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;
- To establish immunization regimen for the prevention of viral nervous necrosis for high value marine fish
- To establish novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important mariculture fish;
- To evaluate various carriers for shrimp vaccination and to establish practical delivery methods and efficacy under field conditions;
- To elucidate the parasitic diseases as well as symbionts of abalone among wild and cultured populations; and
- To disseminate output of the project.

3.2.3 “Steps” toward achieving final goals:

Step 1:

- Improvement of awareness about fish health management in Member Countries through industry-wide capacity building;
- Surveillance of health status program to assess the presence and prevalence of fish-borne zoonotic parasites in freshwater fish in Cambodia, Lao PDR and Myanmar;
- Development and optimization of Q-PCR and LAMP protocols for detection of fish and shrimp viral diseases;
- Vaccination of potential broodstock of various marine fish and optimization of vaccine safety and dosage;
- Isolation of indigenous bacteria and viruses with antiviral potentials and screening of antibacterial and antiviral compounds from seaweeds;
- Field trial to determine the efficacy of formalin-killed vaccine against WSSW and screening of suitable carriers for vaccine delivery in shrimp;
- Epidemiological investigation of parasitic diseases in hatchery-reared abalone; and
- Implementation of training course.

Step 2:

- Conduct training course to improve awareness about fish health management;
- Training of counterparts in host countries on on-site sampling and identification of disease or disease-causing organisms;

<ul style="list-style-type: none"> • 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; • Determination of the correct timing/schedule of booster vaccination; • Screening of bacteria and bioactive compounds from seaweeds for their antiviral activity <i>in vitro</i> and <i>in vivo</i>; • Tests of booster immunization schemes and various delivery methods; • Epidemiological investigation of parasitic diseases in the grow-out of abalone in Igang Marine Station; and • Workshop/seminar.
<p>Step 3:</p> <ul style="list-style-type: none"> • Plan and implement guided research and information dissemination; • Completion of baseline information on fish-borne zoonotic parasite fauna found in wild and cultured freshwater fish in Southeast Asian region; • Application of Q-PCR and LAMP optimized protocols in surveillance and diagnosis of fish and shrimp viruses and susceptibility experiment; • Investigation on the duration of protection in larvae conferred by maternal antibodies and selection of less stressful routes of booster vaccine administration; • Characterization and purification of the novel antiviral compounds from bacteria and seaweeds and assay of their efficacy; • Test of vaccine efficacy in different shrimp species under laboratory conditions and verify the efficacy under farm conditions; • Description of diagnosis of infection, accomplishment of infection bioassay and establishment of methods of prevention; and • Dissemination of output of the project.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 2
(2) Program duration: 2010-2014
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • Accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building <ul style="list-style-type: none"> - Survey on the status and needs of primary aquatic animal health care in small-scale aquaculture; and - Surveillance and training on parasite fauna of freshwater fish in some Southeast Asian countries • Innovative Research to Guarantee Food Safety and Sustainable Production <ul style="list-style-type: none"> - Molecular diagnosis and prevention of economically-important viruses in fish and shrimp; - 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 mariculture fish; - Evaluation of carriers for practical delivery of vaccines to shrimp and other crustaceans; and - Parasitic and shell diseases of abalone (<i>Haliotis asinina</i>) in Philippines • Dissemination of output of the project through publication and international workshop

3.2.5 Progress and achievements of the current project:

<p>(1) Main activities conducted in the current project</p> <ul style="list-style-type: none"> • To equip the Fish Health staff in target countries with capabilities to do disease surveillance and to conduct simple research related to diseases and food safety; • To investigate the fish-borne zoonotic parasite fauna in both wild and cultured freshwater fish of some Member Countries and to examine its diagnosis of infection, pathology and the host-parasite relationship; • To develop Q-PCR-based detection method for fish and shrimp viral pathogens; • To establish immunization regimen for the production of VNN-resistant sea bass and grouper brood stocks; • To isolate indigenous bacteria, fungi and viruses from wild and cultured freshwater and marine fishes, and indigenous seaweeds, that possess antiviral properties against important viral diseases;
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- To provide preliminary information for a later field trial with vaccines delivered by a vector/carrier;
- To investigate shell abnormalities and diseases of abalone with particular reference to parasites; and
- To disseminate output of the project

(2) Main achievements till the end of 2012 (tentative)

- The Aqua-health Online Course (AHOL) started on the second week of September and will finish in February 2013. Survey of fishfarmers in Cambodia to document their farming practices and fish health awareness is scheduled in the 3rd week of October;
- Sampling for fishborne zoonotic parasites analyses was conducted on 30 July-05 August 2012 in Region X-Northern Mindanao areas, Philippines. Results showed that no metacercariae was recovered in all fish tissues;
- Plasmid positive controls for WSSV, RSIV and KHV were developed. The q-PCR protocols for WSSV, IMNV, RSIV, KHV and VNN were optimized;
- After the 3rd booster-vaccination, mean NNV-neutralizing antibody titers in the sera of sea bass taken at 2, 4, 6, 9, and 12 months post-3rd booster vaccination were 1: 12796±5086, 7961±2281, 4153±1233, 3840±1368 and 830±387, respectively. On the contrary, neutralizing antibodies were not so far detected (<40) in the sera of any unvaccinated fish examined;
- Preliminary results indicate the potential use of *U. pertussa* extracts as prophylactic/therapeutic agent against VNN in pompano juveniles;
- The vaccine+carrier complexes were administered orally through the feed for 2 weeks, followed by a WSSV challenge conducted over 18 days. The challenge experiment has just been completed and the data is being analyzed;
- Live abalones (n=180) were collected from SEAFDEC/AQD Abalone Hatchery and examined for parasites and shell diseases. Results showed that shells were bored with burrowing polychaetes belonging to the family Dorveillidae (prevalence, 18%); and
- International Workshop on Fish Health Management “Accelerating Awareness and Capacity-Building in Southeast Asia” was held at Iloilo City, Philippines on 01-02 March 2012.

(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)

Expected Outputs	Achievement rate (%)
• Awareness about fish health management in resource-deprived countries through industry-wide capacity building accelerated	60%
• Food safety and sustainable production through innovative research guaranteed	60%
• Outputs of the project disseminated	60%

3.2.6 Evaluation of project activities in 2012:

The project progress in 2012 can be highly evaluated due not only to contribution to the advanced knowledge but also due to significant efforts made in disseminating information on fish health through trainings and the International Workshop on fish health management.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration
<p>1. Accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building</p> <ul style="list-style-type: none"> • Survey on the status and needs of primary aquatic animal health care in small-scale aquaculture ---- Conduct farm questionnaire survey or focus group discussions in the remaining target areas (other important commodities identified in year 1 of the project). Continue training and information dissemination activities. • Surveillance and training of fishborne zoonotic parasites of commercially important freshwater fish in some Southeast Asian countries ---- 1) Parallel sampling for zoonotic parasites will be continued in some regions in the Philippines, where freshwater fish farming activities are widely practiced. 2) After the wrap-up of results obtained in the three target countries (Cambodia, Lao PDR and Myanmar) in the previous years, re-visit to the country that still need intensive capacity building of fish health diagnosis through expanded training will be conducted. In addition, 3) guidelines and recommendations of prophylactic and 	Jan-Dec 2013

control methods of these zoonoses will be formulated.	
<p>2. Innovative Research to Guarantee Food Safety and Sustainable Production</p> <ul style="list-style-type: none"> • Molecular diagnosis and prevention of economically-important viruses in fish and shrimp --- - 1) The development of plasmid positive controls for IHNV, TSV, IMNV and VNN will be continued and completed. 2) The optimization of q-PCR based detection method for IHNV and TSV and the LAMP-based detection method for fish and shrimp viral pathogens will be completed. • Establishment of immunization regimen for the prevention of viral nervous necrosis in high value marine fish ---- Collecting blood samples, <i>i.e.</i> for the determination of neutralizing antibody titer, from both vaccinated and unvaccinated sea bass at scheduled intervals post-booster vaccination/ L-15 injection (control) will be continued. • Establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important cultured fish ---- Experiments clearly elucidating the anti-NNV effectivity and efficacy of <i>Ulva pertusa</i> extracts will be conducted in vitro and in vivo, respectively. • Evaluation of carriers for practical delivery of vaccines to shrimp and other crustaceans ---- Experiments will be conducted to compare the efficacy of plasmid vaccine and inclusion bodies. In addition, the different vaccine-carrier ratios and effective dosages will be tested. • Parasitic and shell diseases of abalone (<i>Haliotis asinina</i>) in Philippines ---- 1) Intensive parasitological screening of hatchery-reared abalone through histology and gross examination will be continued. 2) Reproductive characteristics and infection mechanisms of shell-boring polychaetes will be clarified as well as effects of the infection on the health of abalone. 3) Guidelines of prevention and control methods for shell-boring polychaetes and other parasitic infections will be formulated. 	Jan-Dec 2013

4.2 Expected Outputs in the Year 2013

The envisaged outputs for the fourth year are: 1) increased awareness of primary aquatic animal health care in small-scale aquaculture; 2) prophylactic and control methods of zoonotic parasite of freshwater fishes formulated; 3) plasmid positive controls for IHNV, TSV, IMNV and VNN developed, 4) level of neutralizing antibodies in the sera of booster vaccinated and unvaccinated sea bass broodstocks determined; 5) antibacterial activity in vitro and in vivo evaluated; 6) practical delivery system examined and administration method optimized; and 7) reproductive characteristics and infection mechanisms of shell-boring polychaetes clarified and guidelines of prevention methods for parasite infections formulated.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust II: Enhancing Capacity and Competitiveness to Facilitate International and Intra-regional Trade
Project Title:	Food Safety of Aquaculture Products in Southeast Asia
Lead Department:	Aquaculture Department
Lead Country:	Philippines
Total Duration:	2010-2014

1. INTRODUCTION

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. 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 fork. Uncontrolled use of chemicals of course should be prevented to secure human health and wholesome aquatic ecosystem with keeping from loading of harmful chemicals. Certificates guaranteeing safety of food would be increasingly important, particularly for trading.

The mechanisms of accumulation and withdrawal of some antibiotics and chemicals have already been studied in developed countries. However, these data were generated using their species and under environmental conditions that are different from the conditions prevalent in the Southeast Asian region. There are still 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 take the lead in establishing regional guidelines on the right usage of antibiotics and other chemical inputs.

At almost the same time when this project started, ASEAN also initiated the preparation of guidelines for the use of chemicals in aquaculture and measures to eliminate the use of harmful chemicals with the Department of Fisheries Malaysia as the lead country. This is based on the declaration on the ASEAN Economic Community Blueprint to realize the ASEAN Economic Community (AEC) in the 13th ASEAN Summit held in Singapore in November 2007. Since the purposes are common between the activities under the present project funded by Government of Japan and the guidelines led by ASEAN, SEAFDEC/AQD and ASEAN agreed to collaborate with each other and to make a better guideline so that more practical, detailed information could be disseminated and utilized effectively in the Southeast Asian region.

The results of this project will also be useful for the formulation of policy recommendations for a concerted action by governments of the ASEAN Member Countries.

2. PROJECT

2.1 Objectives

- 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.

2.2 Project Description

The Aquaculture Department of SEAFDEC will be responsible for this project and will manage and coordinate all project activities. Other ASEAN Member Countries, which have been identified as core countries will be contacted for possible collaboration on the surveillance of chemicals usage/regulation, and the analysis of the target chemicals under a cost-sharing basis.

Surveillance activity of chemical contaminants such as pesticides, mycotoxins and antibiotics will be continued based on the results of TF4.

The expected outputs for the project will include the establishment of guidelines on appropriate administration and withdrawal of chemicals that are collaboratively brushed up 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.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities/Achievements in the Year 2012

The progress of activities for the third year are summarized as follows: 1) withdrawal period of antibiotics in mangrove red snapper is being analyzed; 2) final samples obtained and surveillance of chemical contaminants in aquaculture products and feeds are being analyzed; 3) the complementary parts of the updated ASEAN guideline draft have been discussed; and 4) international training course on food safety scheduled in mid November has been prepared.

Activity Title	Duration
1. Withdrawal period of antibiotics in some fish species cultured in the tropics <ul style="list-style-type: none"> Determination of the residues of commonly used antibacterial agents, oxytetracycline (OTC) and oxolinic acid (OXA) on muscles in mangrove red snapper <i>Lutjanus argentimaculatus</i> and the withdrawal periods are now on-going. 	Jan-Sep 2012
2. Surveillance of chemical contaminants in aquaculture products and feeds <ul style="list-style-type: none"> (Analyses of both antibiotics and pesticides for samples obtained so far have not yet completed. 	Jan-Sep 2012
3. Guidelines on appropriate administration and regulation of antibiotics/other chemicals <ul style="list-style-type: none"> To complement of the ASEAN Guideline entitled "GUIDELINES ON THE USE OF CHEMICALS IN AQUACULTURE WITHIN ASEAN", on which the finalization meeting was held in Kuala Lumpur, Malaysia on 10-12 July 2012, it was discussed that more detailed information such as withdrawal periods, survey results on residues, effects of temperature differences, comparison with EU, US or Japan guidelines, especially data on the maximum residue levels (MRLs), etc. should be noted for the future version. 	Jan-Sep 2012
4. Training course <ul style="list-style-type: none"> International training course on food safety will be held on 12-16 November 2012 at SEAFDEC/AQD Tigbauan Main Station. 	12-16 Nov 2012

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Food safety of aquaculture products in Southeast Asia
(2) Issues in the region at the beginning of the study: 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 fork. There are very limited data available on the withdrawal period of antibiotics and the presence of chemical residues in aquaculture products from the region. In view of the growing-awareness on issues of food safety of aquaculture products, it is an urgent matter that SEAFDEC take the lead in establishing regional guidelines on the right usage of antibiotics and other chemical inputs in collaboration with ASEAN that will allow farmers to increase production of safe food using the environment-friendly technologies.

3.2.2 Expected final goals 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; and
- To implement training course/workshop to promote food safety awareness in the ASEAN region.

3.2.3 “Steps” toward achieving final goals:

- Step 1:**
- Literature survey & method validation;
 - Acquisition of reagents, sample collection in Philippines and analysis of samples;
 - Surveillance of antibiotics/chemicals usage; and
 - 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; and
 - 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 and guideline preparation; and
 - International workshop/publication

3.2.4 Activities in the current project:

- (1) Current position of the project:** Step 2
- (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; and
 - Training course/workshop

3.2.5 Progress and achievements of the current project:

- (2) Main activities conducted in the current project**
- To detect withdrawal period of antibiotics in important cultured fishes;
 - 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; and
 - To implement of training course/workshop

(2) Main achievements till the end of 2012 (tentative)	
<ul style="list-style-type: none"> • The feeding experiment for drug residues analyses on muscles in mangrove red snapper has been concluded and all samples were retrieved. Blood sera were purified and fish muscles were separated, chopped, weighed and stored in ultra low freezer. Extraction of drug residues from fish muscles, purification of samples and injection in HPLC to quantify residues is scheduled; • All samples were completely analyzed for OTC. For OXA, 11 remaining samples were processed and ready for HPLC injection. More than 95% for OXA has been analyzed. For organochlorine pesticides (OCPs), 18 samples were processed. Positive results were obtained for OTC and OCPs (Methoxychlor & Endrin aldehyde); • Participated in finalization of ASEAN Guidelines on Chemical Use in Aquaculture and measures to eliminate the use of harmful chemicals in Kuala Lumpur, Malaysia on 10-12 July 2012; and • Preparation for an international training course on food safety in Aquaculture in Southeast Asia is now on-going. 	
(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)	
Expected Outputs	Achievement rate (%)
• Contributed on the establishment of guidelines on the production of safe aquaculture products from Southeast Asia	50%
• Presence and levels of commonly used chemicals in aquaculture in aquaculture products such as fish and shrimps determined	50%
• SEAFDEC guidelines on the use of antibiotics and chemicals in aquaculture to the ASEAN region compiled and disseminated	50%
• Training course/workshop to promote food safety awareness in the ASEAN region implemented	60%

3.2.6 Evaluation of project activities in 2012:

The progress in activities on detection on withdrawal period of antibiotics and surveillance of chemical contaminants has been affected by breakdown of High Performance Liquid Chromatography (HPLC) in AQD. The activity on guidelines had to keep pace with the progress of ASEAN workshop for the preparation of the ASEAN guidelines. Because of these circumstances, the progress of the project as a whole seems a little bit behind the schedules initially planned, although the direction of the project is judged to be appropriate.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration
1. Withdrawal periods of antibiotics in some fish species cultured in the tropics <ul style="list-style-type: none"> • Determination of the withdrawal periods of oxytetracycline (OTC) and oxolinic acid (OXA) on a high-value marine species ---- Among grouper, pompano and seabass, or milkfish reared in brackish water, 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 analyzed in the previous years will be done. 	Jan-Dec 2013
2. Surveillance of chemical contaminants in aquaculture products and feeds <ul style="list-style-type: none"> • Establishment of a new method of determining antibiotics in aquaculture product ---- Fish muscle samples showing positive results for OXA and OTC using HPLC will be tested with the micro-organism method for their parallel detection. The minimum requirement level (threshold) and standard line detecting OXA and OTC concentrations by the micro-organism method will be established using the diameter of inhibition circle shown by the micro-organism sensitive to the antibiotics. 	Jan-Dec 2013
3. Guidelines on appropriate administration and regulation of antibiotics/other chemicals <ul style="list-style-type: none"> • Guidelines establishment for antibiotics/chemicals usage and regulations ---- Guidelines will be finalized for the SEAFDEC Member Countries by filling the gaps of the ASEAN guidelines on chemical use so that a comprehensive guideline can be realized. 	Jan-Dec 2013



4. Training course/workshop

- International Workshop entitled “Food Safety of Aquaculture Products in Southeast Asia” which was originally scheduled in 2012 and postponed in 2013 will be convened on 8-9 May 2013.

8-9 May
2013

4.2 Expected Outputs in the Year 2013

The envisaged outputs for the fourth year are: 1) withdrawal period in a high value fin fish determined; 2) a new method of determining antibiotics in aquaculture product samples explored; 3) guidelines for the SEAFDEC Member Countries finalized; and 4) International Workshop on “Food Safety of Aquaculture Products in Southeast Asia” conducted.

PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries
Project Title:	Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea (<i>New Title: Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia</i>)
Lead Department:	SEAFDEC Secretariat
Lead Country:	Thailand
Total Duration:	2009-2012 (to be extended to 2013-2017)

1. INTRODUCTION

Natural resources management including aquatic resources, fisheries and the importance to properly manage important coastal and inland environments/habitats as well as to maintain protective geographical features will in Southeast Asia and among ASEAN Member Countries remain key important areas to address now and in the foreseeable future. This is emphasized when seen in the perspective of poverty reduction and the need to maintain a socially sound, economically balanced and sustainable development based on a healthy and productive environment in the ASEAN Region while living up to the expectations of an ASEAN Community by 2015. To reverse present trend of environmental degradation, depletion of aquatic resources and to address social well-being and working conditions of people involved in fisheries and related activities specific attention is needed on the management of fishing capacity (large and small) including labour and safety aspects and the status of migratory fish-workers.

Suggested interventions are built upon experiences from present, and earlier, process of SEAFDEC-Sida project implementation, consultations and recommendations in/from Member Countries, cooperating organizations and other projects and initiatives. In the process of implementation the basic strategy is to build upon expressed needs that include an increased attention to social matters and aspects related to poverty reduction, to maintain a healthy and productive environment, to mitigate impacts of climate change and to build up adaptive capacity. Specific attention is needed to be given to the importance to integrate or coordinate fisheries management and habitat management and in the process recognize the importance to manage fishing capacity (large and small scale) and to reduce over-capacity, destructive and illegal fishing (combat IUU fishing) as a priority to reverse environmental degradation trends, biodiversity loss and to secure means of maintained livelihood for rural (coastal and inland) communities.

2. PROJECT

2.1 Objectives (Development Objectives)

Long-term sustainability of aquatic resources utilization/fisheries and reduced vulnerability to impacts of climate change of people dependent on aquatic resources/fisheries for their livelihoods in the ASEAN region

2.2 Project Description (Immediate Objectives)

- 1) Capacity for the management of fisheries and important coastal habitats and the protection against natural hazards (and adaptation to climate change) built up around the Andaman Sea, the Gulf of Thailand, Sulu-Sulawesi Seas and the Mekong (integration of habitat and fisheries management);
- 2) Capacity strengthened and systems improved to monitor, record and control active fishing effort (large and small scale) as a basis for development for coordinated plans for management actions on fishing capacity around the Andaman Sea the Gulf of Thailand, Sulu-Sulawesi Seas and the

- Mekong and among ASEAN-SEAFDEC Member Countries (to prepare for adaptive measures needed to respond to impacts of climate change and to combat IUU fishing); and
- 3) Support to policy development, including process to reach consensus on key issues, and the process to establish a regional fisheries management mechanism and sub-regional agreements as well as bi- and trilateral arrangements for/in the ASEAN region

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

The Project has been implemented the activities from 2009-2012 (extended until December 2012), according to the Agreement between SEAFDEC and Sida.

3.1 Activities Achievements in the Year 2012

Activity Title	Duration
Major events organized in 2012	
1. The Result-based Management Workshop, Bangkok, Thailand	11-13 Jan 2012
2. SEAFDEC-Sida Project Annual Review Meeting	12 Mar 2012
3. The Sub-regional Consultative Workshop of the Northern Andaman Sea	13-14 Mar 2012
4. In-house Training Workshop on Project Development and Management Using Logical Framework (LFA), SEAFDEC/TD	22-24 Aug 2012
5. The 2 nd Meeting of the Andaman Sea Sub-region	28-29 Aug 2012
6. The 1 st Workshop on Fish Sampling Survey, Ranong, Thailand	10-14 Sept 2012
7. The 2 nd Workshop on Fish Sampling Survey, Yangon, Myanmar	1-4 Oct 2012
8. Participation in the following events:	
• Regional Workshop on MPA organized by FAO/SEAFDEC, in Bangkok	30 Jan-1 Feb 12
• BOBLME Partner's Meeting, Bangkok	28 Feb 2012
• IUCN 1 st Annual Coastal Forum on Building Coastal Resilience in Vietnam, Cambodia and Thailand, Chanthaburi province, Thailand	29 Feb-2 Mar 12
• 1 st FAO Regional Conference for Asia and the Pacific, Vietnam	15-16 Mar 2012
• 3 rd Sub-regional Meeting on RPOA-IUU SCS, Sulu-Sulawesi Sea, Kota Kinabalu, Sabah, Malaysia	19-22 Mar 2012
• 44 th Meeting of SEAFDEC Council, Nay Pyi Taw, Myanmar	2-7 Apr 2012
• The FAO/APFIC Regional Workshop to Support the Implementation of the 2009 FAO Port State Measures Agreement, Bangkok	23-27 Apr 2012
• The Mekong 2 Rio: International Conference on Transboundary River Basin Management, Phuket, Thailand	1-3 May 2012
• 3 rd CTI Regional Exchange on Implementation of Ecosystem Approach to Fisheries Management (EAFM), Putrajaya, Malaysia	22-25 May 2012
• 4 th ASEAN Fisheries Consultative Forum (AFCF), Indonesia	4-5 Jun 2012
• CTI Coral Triangle Fishers Forum II, Fiji	18-22 Jun 2012
• Expert Meeting on Fishing License and Boat Registration in Southeast Asia, Bangkok	25-28 Jun 2012
• The Policy Roundtable: Sharing Regional Terrestrial, Water, and Natural Resources-Beyond Territorial Sovereignty, Chiangmai	26 Jul 2012
• 4 th APFIC Regional Consultative Forum, Danang, Vietnam	17-19 Sept 2012
• BOBLME Regional Policy Workshop, Penang, Malaysia	2-4 Oct 2012

3.2 Evaluation of the Project Outputs Till the Year 2012

The Project had done the independent evaluation by external reviewers and had submitted to Sida in November 2011.

3.2.1 Theme and issues:

(1) Theme:

- 1) Capacity for the management of fisheries and important coastal habitats (*refugia*) and the protection against natural hazards built up around the Andaman Sea (integration of habitat and fisheries management);

<p>2) Capacity strengthened and systems improved to monitor, record and control active fishing effort (large and small scale) as a basis for development for coordinated plans for management actions on fishing capacity around the Andaman Sea and among ASEAN-SEAFDEC Member Countries (to prepare for adaptive measures needed to respond to impacts of climate change); and</p> <p>3) To provide support to policy development and the process to establish a regional fisheries management mechanism and sub-regional agreements for/in the ASEAN region including reached consensus on key issues.</p>
<p>(2) Issues in the region at the beginning of the study:</p> <ul style="list-style-type: none"> • The vulnerability of poorer coastal and inland communities to natural hazards and the risk of them being (further) marginalized by increased frequency and infrastructure developments in coastal and around rivers inland water-bodies; • The need to manage Fishing capacity; • Maintaining geographical features in coastal areas and around inland water-bodies, recognizing the importance of features (mangroves, corals, dunes, wetlands, rivers, etc.) in the coastal areas for protection against natural hazards needs to be assessed as well as for fish reproduction; and • Local knowledge and local organization: Several reports have pointed at the way in which certain coastal and inland communities, based on their traditional knowledge, are facing less damage by natural hazards than other communities.

3.2.2 Expected final goals of the project:

To improve capacity and coordination for fisheries and habitat management; improved cooperation on the management of fishing capacity; and to support processes to establish regional and sub-regional fisheries and habitat management mechanisms and agreements.
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3.2.3 “Steps” toward achieving final goals:

The strategies for driving this process will be to encourage and facilitate cooperation among ASEAN-SEAFDEC Member Countries, at regional and sub-regional level, by addressing different important fisheries-related issues, such as the management of fishing capacity, vessel registration, combat illegal fishing (IUU) and the mitigation of conflicts among fishers, habitat management/ <i>refugia</i> or marine protected areas, information sharing and on the important aspects that will emerge such as climate change and adaptation. The project will promote and raise awareness on mentioned aspects at the local level and Strengthen cooperation at sub-regional of the Andaman Sea and the Gulf of Thailand countries and among ASEAN countries

3.2.4 Activities in the current project:

(1) Current position of the program: Not applicable as the strategy is based on a rolling planning schedule and steps of progress in implementation and achievements emerge in parallel
(2) Program duration: 2009-2011 (extended until December 2012)
<p>(3) Main activities</p> <ul style="list-style-type: none"> • Integration of Fisheries and Habitat Management; • Monitor, Record and Control of active fishing capacity; • Local knowledge, cross cutting issues; • Policy dialogue and promotion of regional cooperation; and • Project Management and coordination

3.2.5 Progress and achievements of the current project:

The SEAFDEC-Sida Project has been successfully organizing events at provincial, sub-regional and regional levels during 2009-2012. Two sub-regional Workshops conducted namely: Southern and Northern Andaman sea participated by stakeholders including coastal communities, local and central governments from different agencies *i.e.* fisheries, environment, marine transport, academic, local administration. During the events, awareness were raised and provided recommendations on key areas for improved and effective fisheries management including the management of fishing capacity; improved port monitoring, Monitoring Control and Surveillance (MCS) system; and fishing licensing and registration systems as tools to strengthen efforts to integrate fisheries and habitat management by



reducing overcapacity and destructive fishing. The outcomes are summarized by categories as the following groups:

Integration of habitat and fisheries management

The conservation and regulation of fishing effort for trans-boundary fish species, such as *Rastrelliger* spp. is important in the Andaman Sea sub-region. The SEAFDEC-Sida Project has initiated the process of promoting the cooperation on sub-region management efforts to regulate fishing efforts through the First Meeting of the Andaman Sea sub-region in 2009, as well as during the sub-regional events and on-site events organized by SEAFDEC-Sida Project and BOBLME project 2009 to 2012.

During the on-site events/capacity building events information was provided and awareness was raised on the importance of coastal habitats and the need to integrate the fisheries and habitat management. The information was provided during the events to provincial/local authorities and coastal communities in the four eastern Andaman Sea countries, with specific focus on the need to give special attention to migratory (trans-boundary) stocks, such as *Rastrelliger* spp. and other related species.

Information on the importance of coastal habitats, and a set of criteria for development of larger fisheries management and conservation areas (building upon existing, smaller, management areas) were introduced to local fishers and relevant local and central institution responsibilities of countries around the Andaman Sea. The concept was well recognized taking into consideration the following factors:

- To build upon an aggregation of smaller management areas (established for local fisheries, fisheries resources protection, habitat management and/or other purposes);
- To recognise the existing zoning schemes (like trawling free zones); and
- To take note of the seasonality in fishing, fish migration/spawning, etc.

To continue the process to develop sub-regional arrangements in the Andaman Sea Sub-region it was stated, during the events referred to above, the cooperation among countries with an aim to develop sub-regional arrangements would be further strengthened if facilitating a dialogue with groups of fewer countries with more easily distinguished common problems and priorities (on habitats, fisheries, fishing capacity, etc). Following this recommendation, the area was further sub-divided into the Southern Andaman Sea (Indonesia, Malaysia and Thailand) and the Northern Andaman Sea (Myanmar and Thailand).

The SEAFDEC-Sida Project and the BOBLME Project followed up, after the on-site events, with consultations for each of these two sub-regions. During the Sub-regional Consultative Workshops for each of these two sub-regions countries discussed and reviewed problems and suggested solutions on matters of importance to fisheries and habitat management for the Northern and Southern part, respectively. The possibility of improved regulations (closed seasons, etc) of fishing activities on trans-boundary fish species such as *Rastrelliger* spp. of each sub-sub-regions were also discussed as was the matter of illegal fishing. It was generally agreed that agreements on such regulations could be of great importance to this sub-region.

The 2nd Meeting of the Andaman Sea sub-region held in August 2012, Phang-Nga, Thailand expressed positive responses and scientific-based information would be required for the management of the species in broader areas. In addition, information should be shared to provide input to the preparation of better mackerel resource management. However, the Mackerel management plan(s) would have to be aligned (and not conflicting) with each of the national plan (if already in existence) to secure efficiency.

Monitoring, Record and Control – large scale and small scale (coastal) fishing incorporating with local knowledge and climate change

A common problem faced by most of countries is the encroachment of larger vessels into coastal waters and destructive fishing in critical habitats. Continued efforts are made by the SEAFDEC-Sida Project to improve of fisheries management around the Andaman Sea through the sequence of On-site Workshops, Sub-regional Meetings of the Southern and Northern Andaman Sea during 2009-2012. The events included information and discussions on rules and regulations on the management of fishing

capacity and the need to combat illegal and destructive fishing cooperation. There is a need to build upon regional and sub-regional cooperation and to promote efforts with respect to “Monitor, Control and Surveillance”, “vessel records and inventory” and “Port monitoring” to monitor, assess and record the status of fisheries in the Gulf of Thailand, the Andaman Sea and the region as a whole.

The process, and the forms, was in 2009, 2010 and 2011 introduced to the series of On-site Trainings/Workshops conducted in selected local sites. The workshops provided information on the national fishing vessel registration and licensing system to the local fishers in respective countries by national concerned officers. However, there is no immediate need to follow up on the “forms” at national level but rather focus on the information needed to monitor and control fishing vessels (movements and fishing activities) in sub-regional and local areas of priority for the Andaman Sea Countries. This local approach is also relevant for the SEAFDEC-Sida Project as the Japanese Trust Fund and FAO Global Record has an ambition to work on national, regional and global aggregated vessel records. SEAFDEC-Sida Project is advised to follow the progress of these initiatives and provide inputs on local initiatives as relevant.

Effort to address the issues of MCS networks by the SEAFDEC-Sida Project has been made since 2009. The importance of the strengthening of the sub-regional and/or bilateral dialogue on joint management was emphasized to be able to agree on improvement of fisheries management to control/manage fishing capacity and to build MCS networks. To broaden the area and the perspectives provided during the on-site events to include dialogue and the promotion of joint management approaches among neighbouring countries, two Sub-regional Consultative Workshops were conducted in cooperation between Andaman countries, SEAFDEC and BOBLME namely: Southern Andaman Sea and Northern Andaman Sea where the sub-regional Workshops brought together officers from different relevant agencies to share and exchange the information with an aim to strengthen dialogue on possible sub-regional cooperative management arrangements.

The rationale for the establishment of a MCS network are to assist countries (governments, private sector/industry and fishermen) around the Andaman Sea, or in specified sub-areas, to cooperate in monitoring and control of fishing and habitat conservation, thereby also preparing themselves for increasing demand and legal measures and regulations such as catch documentation, product traceability, social and environmental requirements, measures to combat IUU fisheries, etc and other requirements to achieve and maintain sustainable fisheries.

Furthermore, for the Port State Measures Agreement and the process leading up to the Agreement is the increased attention and *importance being given to fishing ports and landing sites* in the process of monitoring and control of fisheries and the legal status of landed fish catch. The PSM could be seen as a response to the failure of flag states to control fishing effort by vessels carrying their flags. At the fishing ports, monitoring and controls of the legal status of catch, vessels and crew are to be made thus increasing the expected functions of the fishing port and highlights the key role being given to “port monitoring” in efforts to control illegal fishing. Organizations/agencies in (fishing) port operations need to be involved in the process and implies that in some countries new partners need to be involved in the process to manage fisheries.

It is important to recognize that through port monitoring local and foreign vessels are monitored to be able to validate the legal status of catches being landed and support the increasing requirements of documentation for catch traceability, quality control and other documentations. To facilitate the process, the support could be provided to the countries to build upon existing well-managed ports to be used as a model for the national development of port monitoring and to establish protocols for fishing port management relevant to the laws and regulations of each country. An agreement between neighboring countries on the legal validity of fish being landed across boundaries could be important to clarify local practices. Efforts should be explored to establish agreements on common practices and the legal status for border areas in the Andaman Sea, such as between Myanmar and Thailand and in the southern part between Indonesia, Malaysia and Thailand. Therefore, close cooperation should be enhanced among the countries around sub-regional seas where countries share common interest in sustaining the benefits derived from productive fisheries, clarify the legal status of catches and landing - and to eventually effectively reduce illegal and destructive fishing in the region.



Furthermore, it is well known that the **importance of local knowledge is a factor to be recognized in developing adaptive capacity**, specifically on habitat management and the monitoring and control as indicated by experiences in Indonesia and La-Ngu District in Satun, Thailand. Attempts, through feedback from on-site training and other events, to develop “area management systems” would benefit if development could be based on success stories of community involvement in fisheries management using traditional practices (*e.g.* those in Indonesia and Thailand). Three good examples of local practices in fisheries management namely Awig-awig in Lombok, Indonesia, the Panglima Laut Aceh as practiced in Nanggroe Aceh Darussalam, Indonesia, and the local organization of La Ngu District in Satun Province, Thailand and sea gypsies should be well documented.

Policy dialogue and promotion of regional cooperation on fisheries management

In strengthening the cooperation among ASEAN-SEAFDEC Member Countries, the SEAFDEC-Sida Project has been continuously promoting sub-regional and regional cooperation on fisheries management with responses to climate change. The need for adaptation measures has also been addressed in the process as for long-term sustainability of marine fisheries and habitats in Southeast Asia.

The SEAFDEC-Sida Project made effort to echo issues of combating IUU fishing and fishing capacity management at high decision makers such as ASWGF, SEAFDEC Council. Moreover, the SEAFDEC-Sida Project continued to support the cooperation among ASEAN-SEAFDEC Member Countries. Sub-regional and regional dialogues conducted by the SEAFDEC-Sida Project in collaboration with the BOBLME project around the Andaman Sea, highlighted the process in support the integration fisheries management into habitat management base on Ecosystem Approach to Fisheries (EAF), and to promoted the concept of the establishment and implementation of larger fisheries resources conservation areas (*refugia*) in the sub-regions with management arrangements of trans-boundary nature. In process, the SEAFDEC-Sida Project involved in international *fora* such as ASEAN, FAO/APFIC, BOBLME Project, RPOA-IUU, IMO, ILO as well as maintained dialogues with relevant partners IUCN, WWF, CORIN-Asia.

The two sub-regional consultative workshops organized in cooperation with BOBLME around the Andaman Sea Countries have so far provided important steps in building a basis for information sharing within and among a) Indonesia, Malaysia and Thailand and b) Myanmar and Thailand, respectively. In the promotion of regional cooperation, the events have been productive in building up a common understanding on key issues and problems that need to be addressed by the countries through joint efforts, such as the encroachment of larger vessels into coastal waters, trans-boundary migratory stocks and critical habitats of importance to fish and ecosystems management including responses to climate change and adaptation.

Furthermore, the SEAFDEC-Sida Project will continue to strengthen the ASEAN cooperation and to build upon the lead countries for the ASEAN Fisheries Consultative Forum (AFCF) “key clusters” under the AFCF framework.

References to outcomes and results on the process to *foster improved regional cooperation* can be found in documents by ASEAN and ASEAN Working Groups, SEAFDEC Reports, SEAFDEC Council, FAO/APFIC, the RPOA, BOBLME and other sources. Important references to the progress in promotion of regional cooperation are also to be found in results and outcomes from Regional Consultations and Expert Meetings, including active interventional in non-SEAFDEC events that promotes and advances the process to develop the fisheries management mechanism.

Climate Change

The approach taken by the Project on *Climate Change* has increasingly been recognized by Member Countries and during the SEAFDEC-Sida Project events and other relevant international and regional events. The approach is to build an awareness in specific areas, in provinces, national and sub-regional and regional levels to see that better organization at village level and provinces, improved habitat

management and restored habitats, reduction of (destructive) fishing, improved registration of vessels, licensing to fish, reduction of (destructive) fishing, developing MCS networks, safety at sea, etc are in fact helping to build adaptive capacity and help to mitigate possible impacts of climate change. Subsequently, capacity building, including specific focus to build up resilience and protection against national hazards and effects of climate change should be incorporated in the context of coordinated habitat and fisheries management, larger fisheries resources conservation areas, management of fishing capacity that would include safety standards as well as the preparedness and ability of crew-members and not as “stand alone” items.

The work so far, with partners in the region, has clearly indicated that improved resources and environmental management is linked to the process to build up resilience and adaptive capacity, of which some of the basic elements to address poverty alleviation are in place. Impacts are in this context to be found in ability to report efforts to improve habitat/fisheries management, improved local organization and reduction of fishing efforts in a “climate change perspective”.

3.2.6 Evaluation of project activities in 2012:

An independent review made by external resource persons in November 2011.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

In March 2012, new requirements were provided by Sida on the need to prepare for annual summary reports to Sida. The requirements were combined with a matrix format for “Results Summary” reporting. In line with the items included in the Summary Results Matrix a slightly revised set of objectives has been indicated as follows:

- 1) *Outcome Objective:* Sustainable Use of Aquatic Resources and Reduced Vulnerability to Climate Change by Coastal/Rural (Fishing) Communities in the ASEAN Region;
- 2) *Bridging Objective 1:* Implementation of Regional and Sub-regional Aquatic Resources Management Actions by National Institutions and Organizations;
Bridging Objective 2: Establishment and Implementation of Regional and Sub-regional Fisheries and Habitat Management Agreements and Action Plans; and
- 3) *Output Objective 1:* Capacity built for integration of habitat and fisheries management and Adaptation to Climate Change around the Andaman Sea, the Gulf of Thailand, Sulu-Sulawesi Seas and the Mekong Basin;
Output Objective 2: Capacity built and systems improved as a basis for development of coordinated plans to manage fishing capacity in and around the Andaman Sea, the Gulf of Thailand, Sulu-Sulawesi Seas and the Mekong Basin and amongst ASEAN-SEAFDEC Member Countries
Output Objective 3: Capacity built and policy development processes improved for the drafting and implementation of regional and sub-regional agreements, including bi and trilateral agreements in the ASEAN Region

The geographical focus is Southeast Asia and implementation will be building upon the cooperation with ASEAN under the ASEAN-SEAFDEC Strategic Partnership (ASSP) and results will be reported to the ASEAN Fisheries Consultative Forum (AFCF) and the ASEAN Sector Working Group on Fisheries (ASWGF). In promotion of sub-regional (tri-lateral and bi-lateral) arrangements specific focus will given to the Andaman Sea (in cooperation with the BOBLME), the Gulf of Thailand, the Sulu-Sulawesi Seas (in cooperation with the Coral Triangle Initiative) and the Mekong River Region (in cooperation with the Mekong River Commission). In managing fishing capacity and to combat IUU fishing SEAFDEC and the Project will coordinate with the Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region.

The continued support by Sida will be started from 2013-2017 with the new title “Fisheries and Habitat Management, Climate Change and Social Well-being in Southeast Asia”.



4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p>Activities on rolling basis will be developed out of the results and experiences- and the need from countries. The action will be refer to the following output groups:</p> <ol style="list-style-type: none"> 1. Integration of fisheries and habitat management; 2. Monitoring, Record and Control-large scale and small scale fishing; 3. Local knowledge, cross cutting issues and safety at sea; 4. Policy dialogue and promotion of regional cooperation on fisheries management; and 5. Project management and coordination <p>Aspects of climate change will be integrated in all outputs groups as a cross-cutting matters to be considered throughout. For detail activities see the project document.</p>	<p>2013 - 2017</p>	<p>As the activities are to be further developed based on results achieved the “duration” would cover the whole five year agreement period</p>

4.2 Expected Outputs in the Year 2013

It is expected that the project will have made further advances in promoting regional and sub-regional cooperation for the Region on important issues such as IUU fishing (managing fishing capacity), the integration of fisheries and habitat management (ecosystem approach to fisheries), addressing the need and opportunities to incorporate aspects of climate change into the program structure and furthermore to strengthen capacity and awareness at local level with involvement of central and local resource persons.

PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries
Project Title:	Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management
Lead Department:	Training Department
Lead Country:	SEAFDEC Member Countries
Total Duration:	2008-2012

1. INTRODUCTION

There are a number of small scale fisheries in Southeast Asia, the most of small scale fisheries are facing a problem on conflict over multiple resource use and livelihood of coastal communities have been further threatened by illegal fishing. This calls for a need to strengthen community fisheries organization and capacity building for better development and management of coastal resources to ensure sustainable livelihood of coastal communities. The project purpose is to promote co-management and rights-based fisheries for coastal fisheries management in the Southeast Asian region. Two strategies are institutional building and participatory mechanism taken an emphasis to encourage the program implementation. The institutional building is to gather all stakeholders to construct an enabling environment of sharing power, responsibility and function for fisheries management. All stakeholders exercise participating in decision-making process to formulate and regulate function, responsibility and authority for fisheries management through training workshop. The knowledge gained from the training workshop will be useful to stakeholders to apply the concept of co-management and rights-based fisheries, which relies on their national fisheries legal framework to promote coastal fisheries management. Other strategy is participatory mechanism of co-management highlighted to promote the regional guidelines on the use of indicators for the sustainable development and management of capture fisheries in Southeast Asia. The appropriate participatory mechanism of co-management fosters interested parties participate in making decision process to either select best available information or adapt policies and management framework to obtain more responsible and sustainable future condition of fisheries resources.

2. PROJECT

2.1 Objectives

- 1) To promote the applicable practice of rights-based fisheries and co-management towards institutional building of stakeholders for coastal fisheries management;
- 2) To introduce the appropriate participatory mechanism of co-management to foster the use of indicator for coastal fisheries management; and
- 3) To overview feasibility on traditional small-scale fisheries, community information and scientific database to formulate a proper action plan and best fitted activities for sustainability of small-scale fisheries and livelihood in fisheries.

2.2 Project Description

Both coastal and inland fisheries resource management is recognized an importance of local users' participation in decision-making process to define solutions in conjunction with issues. Co-management in fisheries and right-based fisheries is innovative practice to strengthen and improve local users' participation enabling coordinated with local government officials for managing fisheries resources in coastal and inland fisheries sector. To promote and support local user coordinating with local government official, SEAFDEC has taken a responsibility to build up and improve fisheries official as facilitator helping local user in managing fisheries resources. Capacity building activities, which are regional training and workshop, are key means to improve capacity of ASEAN fisheries official acknowledged the concept and theoretical framework of co-management and right-based fisheries for fisheries resource

management. Then, they are enable facilitating local users to organize and institute their either group or management body responsible for fisheries resources management. The program of Promotion on supporting gender for entering into alternative livelihood and encourage microfinance service is one way of alternative opportunity to introducing and arranging to community fisheries, and conducted through training program. This program aims to develop traditional knowledge of women in community fisheries in modernization and sanitation for producing community products. The program will develop and strengthen women in community fisheries for both individual and organizational levels to strongly encourage local community business. Promotion and encourage microfinance services, based on execution needs and community's sound structure.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

The strategy and practice of Promotion of fisheries co-management functioning in supporting gender entering into alternative livelihood program will be made a linkage to promoting alternative livelihood to responsible fisheries officials and local user organization. Based on the comment and recommendation grain from the workshop will synthesized and summarized as guidebook distributing to fisheries officials and local users both individual and organization of Member Countries. Moreover, an output of the workshop will be developed as additional subject of the regional training course on co-management and right-based fisheries to enhance fisheries officials to suggest and consult with their responsible fisheries community to seek and employ in a proper alternative livelihood. Based on the status of small-scale fisheries and community need in Southeast Asia, the project will provide the capacity building on alternative livelihood and microfinance service. It is envisaged that this program will improving and sustaining way of life of local people in community fisheries and the increase of food security such in food supply, job opportunity and protection of the environment. Microfinance is needed by the households to increase their income from fisheries activities and other income-generating activities. It is required for social needs related to their quality of life and for smoothening consumption patterns, particularly during lean and off-seasons when little or no income or food is generated.

Activity Title	Duration
<p>Activity 10: Promotion of fisheries co-management functioning in supporting gender entering into alternative livelihood Fisheries co-management is optimistic to perform a function of financial and economic activities management. According to this function, it is an enabling environment to prepare easy-access and basic require contributing local resource users employing in alternative livelihood. Either active or successful cases of fisheries co-management function in financial and economic activities management will illustrate a tangible practice to fisheries officials and local resource users to re-consider and make comparison to their practice and strategy.</p>	<p>October 2012 (Tentative)</p>
<p>Activity 11: Promotion on supporting gender for entering into alternative livelihood and encourage microfinance services Based on the status of small-scale fisheries and community need in Southeast Asia, the project will provide the capacity building on Promotion on supporting gender for entering into alternative livelihood and Promotion and encourage microfinance service.</p> <p><i>Sub-Activity 1: Promotion on supporting gender for entering into alternative livelihood</i> <i>Promotion on supporting gender for entering into alternative livelihood and facilitate training course on Practical Approach to co-management for community level in Phu Yen Province, Vietnam</i></p> <p><i>Sub-Activity 2: Promotion and encourage microfinance service</i></p>	<p>29 August – 1 September 2012</p>

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management

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

It is well recognized that fisheries resources in many places of the world, particularly in our region where coastal fisheries resources are over-exploited and impact to local community and fisher livelihood. Then the co-management and rights-based fisheries for coastal fisheries management in the Southeast Asian region has been promoted to the region in order to achieve fisheries resources management by the local fishers. In the end of the year 2005, co-management using group user rights for small-scale were developed and distribution but it's quite new for the region and might be difficult to understand among fishers even through the fisheries officers and policy makers. The project aims to transfer the knowledge and skill on co-management concept and participatory approach on the areas of defining and sharing responsibility and function between local user-based management either body or organization and government-based agency to carry forward coastal fisheries management. The project aims to understand the status of small-scale fisheries is the first step to lead the way on support to tackling illegal fishing in fisheries communities. Then improving and sustaining the way of life of local people in community fisheries and the increase of food security such in food supply, job opportunity and the protection of the environment. Microfinance is needed by the households to increase their income from fisheries activities and other income-generating activities. It is required for social needs related to their quality of life and for smoothening consumption patterns, particularly during lean and off-seasons when little or no income or food is generated.

3.2.2 Expected final goals of the project:

- 1) To promote and strengthen fisheries officers, policy makers and local users to comprehend the concept and recognize a good lesson and experience to apply an essence into coastal and inland fisheries for better and sustainable fisheries management and development;
- 2) To clarify the importance, objectives and application of fisheries co-management and right-based fisheries enabling secured means of livelihood and poverty alleviation to fisheries communities;
- 3) To facilitate participants sharing and exchanging experiences and views on coastal and inland fisheries for improving fisheries management;
- 4) To understand the status of small-scale fisheries in Southeast Asia; and
- 5) To develop and encourage gender for entering into alternative livelihood.

3.2.3 “Steps” toward achieving final goals:

Step 1: To promote co-management approach as strategy to organize local institution and practice fisheries management in the Southeast Asian region through discussing workshop

Step 2: To distribute a guidebook for promoting fisheries co-management and right-based fisheries approach for fisheries management in the Southeast Asian region

Step 3: To implement of the total community development activity particularly focused on alternative local business development and voluntary participation in community development work.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 3

(2) Project duration: 2008-2012

(3) Main activities

- 1) Organization of regional workshop on Promotion of fisheries co-management functioning in supporting gender entering into alternative livelihood; and
- 2) Capacity building program for alternative local business and voluntary participation in community development.

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project	
<ul style="list-style-type: none"> • Organization of regional workshop on Promotion of fisheries co-management functioning in supporting gender entering into alternative livelihood; • The status of small-scale fisheries and community need in Southeast Asia is under analysis; and • Capacity building program for alternative local business and voluntary participation in community development. 	
(2) Main achievements till the end of 2012 (tentative)	
Fisheries official expertise in capture, aquaculture, biology comprehended an importance of fisheries co-management and right-based fisheries for managing fisheries resources. Nevertheless, they still need to know more on strategy and practice to select a best-fitted way applying into their respective countries.	
(3) Outputs during the period and expected achievement rate till the end of 2012 (tentative)	
Expected Outputs	Achievement rate (%)
<ul style="list-style-type: none"> • Increase number of fisheries officials and fishers to recognize fisheries co-management functioning in financial and economic activities managements for supporting gender entering into alternative livelihood 	80%
<ul style="list-style-type: none"> • The report on status of small-scale fisheries and community need in Southeast Asia is reported, and dissemination to Member Countries. 	80%
<ul style="list-style-type: none"> • Increase number of fisheries communities to seek and employ a proper alternative livelihood. 	60%

3.2.6 Evaluation of project activities in 2012:

An Hoa Commune, Phu Yen Province has a long coastal line, have a lot of anchovy in this area, this is the strong point of this commune to produce fish sauce by cheap raw material than other commune. There are 120 small-scale fisheries household produced fish sauce and sell all products at local market. Province officers try to support them by give logo/ban to their products, and need to encourage their products to sustainable in Phu Yen Province at a long line. SEAFDEC have given consultation to Provincial officers, encourage to establish women group, providing information on advantage of working group, conduct study tour with successful case, transfer processing technology, quality standard, training on packaging, basic accounting, Promote credit scheme to the women group, financial support for group management, and develop marketing channel (linkage with private sector).

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust III: Improving Management Concepts and Approaches for Sustainable Fisheries
Program Title:	Promotion of Fishing License, Boats Registration and Port State Measures (<i>New title: Promotion of Countermeasures to Reduce IUU fishing activities</i>)
Lead Department:	Training Department
Lead Country:	Malaysia
Total Duration:	2011-2015

1. INTRODUCTION

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.

In every country in the Southeast Asian Region, efforts are now focusing on the promotion of sustainable fisheries management and countermeasures against IUU fishing. The 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.

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; 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) had been initiated the project on promotion of fishing license, boats registration and port state measures since 2011 to 2012. The coordination, cooperation and promotion on fishing license and boats registration to combat IUU fishing for sustainable fisheries in the region with Member Countries is conducted and promoted. However, the emphasis of this issue is still need and should be continued. Especially, in some Member Countries that are not strengthen in this issue. Therefore, the project of “Promotion of Counter Measures to reduce IUU Fishing” should be proposed and expanded in the region.

2. PROGRAM

2.1 Objectives

- 1) Counter measures activities to reduce IUU fishing is improved and developed in Southeast Asia; and
- 2) Awareness building and common understanding on counter measures to reduce IUU fishing is strengthened in Southeast Asia

2.2 Program Description

Based on the current situation and the abovementioned concerns, SEAFDEC wishes to propose the technical program to support the Member Countries in promotion of counter measures in IUU fisheries activities with the following proposed activities; 1) Promotion and development of the regional vessels record and improvement of national vessels records and licensing system in the region; 2) Strengthening of Port State Measures activities and other surveillance measures in the region; and 3) Production of information materials.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration
<p>Activity 1: Promotion of fishing license, boats registration and port state measures</p> <p><i>Sub-activity 1.1: Preparatory process of the project activities</i> <i>1.1.1 Regional/ international coordination and cooperation</i> Information exchange on fishing license and boats registration through consultation on project activities implementation was discussed with DOF of Malaysia and National Agriculture Training Council (NATC), Malaysia to strengthen coordination and cooperation with Member Countries and other Institute.</p> <p><i>Sub-activity 1.2: Development of regional guidelines on fishing license, boats registration and/or port state measures in Southeast Asia</i> <i>1.2.1 Experts Group Meeting on Fishing License and Boats Registration</i> This meeting was organized in Bangkok, Thailand. After deliberation, the Meeting came up with: 1) necessary information for vessel registration and fishing licensing of the countries; 2) basic requirements for vessel registration in the Southeast Asian region; 3) sharing information of number of fishing vessel in the region; and 4) national data compilation system for recording vessels 24 meters in length and over. <i>1.2.2 Experts Group Meeting on Port State Measures in Southeast Asia</i> This meeting was organized to find out the obstacle and suitable tangible activities on PSM implementation in the region. The output and recommendations of the meeting and the information provided by the experts will be compiled and used to develop Port State Measures as forward activities in the region for the future.</p> <p><i>Sub-activity 1.3: Production of information and promotional materials</i> The technical movie on “Promotion of counter measures to reduce IUU fishing” in Thai version was produced to awareness common understanding in this issue. Moreover, script in English version of this movie was written and is processing on production.</p>	<p>7 -10 March 2012</p> <p>25-28 June 2012</p> <p>12-14 November 2012</p> <p>January-December 2012</p>
<p>Activity 3: Preventing export of IUU fishing products</p> <p><i>Sub-activity 3.2 Developing regional guidelines to prevent IUU fishing and its products from being exported</i> <i>3.2.1 Gathering information to develop regional guidelines to prevent IUU fishing and its products from being exported</i> Information collecting visits were successfully conducted in Malaysia, Philippines, Vietnam, Myanmar and Indonesia. Information for Brunei Darussalam, Cambodia, Japan, Lao PDR, Singapore and Thailand were/will be obtained through feedback from the questionnaires sent to them in June.</p>	<p>January-December 2012</p>

<p>3.2.2 <i>Regional Workshop to develop regional guidelines to prevent IUU fishing and its products from being exported</i></p> <p>The Regional Core Expert Meeting was conducted in Kuala Lumpur or its surrounding area, Malaysia. The meeting will consolidate information gathered during visits to the five SEAFDEC Member Countries and from response to the questionnaires sent to the other six Member Countries.</p>	<p>20 - 22 November 2012</p>
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3.2 Evaluation of the Program Outputs Till the Year 2012

3.2.1 Theme and issues:

<p>(1) Theme: Promotion of fishing license, boats registration and port state measures</p>
<p>(2) Issues in the region at the beginning of the study:</p> <ul style="list-style-type: none"> • The impact of illegal, unreported and unregulated (IUU) fishing on fisheries resources and stocks; • The European Union (EU) adopted a regulation to prevent, deter and eliminate IUU fisheries on 29 September 2008 that impacts on fisheries export products in the region; • Efforts to combat illegal, unreported and unregulated fishing should be built on the primary responsibility; and • Fishing license, boats registration and port state measures provide including MCS the powerful and cost-effective means of preventing, deterring and eliminating IUU fishing

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • Reducing of IUU fishing activities in the region; • Regional guidelines to prevent IUU fishing and its products from being exported in Southeast Asia; and • Coordination and cooperation with Member Countries, other organizations/institutions to adopt and implement measures to combat IUU fishing.
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3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Preparatory process and cooperation of the project activities</p> <ul style="list-style-type: none"> • Review and documentary analysis on fishing license, boat registration system and other related port state measures in the region; • Collection of information regarding export of fisheries products from SEAFDEC Member Countries; • Coordination and cooperation with Member Countries and regional/international organizations and institution; and • Identification and establishment of core expert group.
<p>Step 2: Development of regional guidelines on fishing license, boats registration and/or port state measures and a regional guidelines to prevent IUU fishing and its products from being exported in Southeast Asia</p> <ul style="list-style-type: none"> • To develop draft regional guidelines on fishing license, boats registration and/or port state measures in Southeast Asia; and • To develop draft regional guidelines to prevent IUU fishing and its products from being exported
<p>Step 3: Promotion on activities of the project</p> <ul style="list-style-type: none"> • To promote of counter measures to reduce IUU fishing activities in the region; and • To produce information materials and disseminate to Member Countries.

3.2.4 Activities in the current program:

<p>(1) Current position of the program: Step 1, 2 and 3</p>
<p>(2) Program duration: 2011-2013</p>
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • Regional experts meeting and workshop; • Production of information and promotion materials; and • Coordination and cooperation with Member Countries and regional/international organizations and institutions for project implementation.



3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> • Coordination and cooperation with Member Countries and regional/international organizations and institutions to combat IUU fishing; • Promotion on counter measures to reduce IUU fishing activities; • Assistance and advice to the SEAFDEC Member Countries in application and implementation of measures to combat IUU fishing; and • Development and implementation of the regional guideline to prevent IUU fishing and its products from being exported. 	
(2) Main achievements till the end of 2012 (tentative)	
<ul style="list-style-type: none"> • Coordination and cooperation with Member Countries and regional/international organizations and institutions to combat IUU fishing; • Identification of regional/international experts on fishing license, boats registration and PSMs; and • The recommendation and information to prepare a regional guideline to prevent IUU fishing and its products from being exported. 	
(3) Outputs during the program period and expected achievement rate till the end of 2012 (tentative)	
Expected outputs	Achievement rate (%)
<ul style="list-style-type: none"> • Development of regional guidelines to prevent IUU fishing and its products from being exported for Southeast Asia 	30%
<ul style="list-style-type: none"> • Coordination and cooperation with Member Countries and regional/international organizations and institutions to combat IUU fishing 	40%
<ul style="list-style-type: none"> • Promotion on counter measures to reduce IUU fishing activities 	15%
<ul style="list-style-type: none"> • Assistance and advice to the SEAFDEC Member Countries in application and implementation of measures to combat IUU fishing 	10%

3.2.6 Evaluation of program activities in 2012:

<ul style="list-style-type: none"> • The review and documentary on fishing license, boat registration system and other related port state measures in the region; • Cooperation/collaboration with Member Countries and other organizations/institutions was enhanced; • Information gathering and sharing regarding export of fisheries products from SEAFDEC Member Countries; and • Recommendations on information required for development of regional guideline on fishing license and boats registration and on prevent IUU fishing and trading of IUU fish and fishery products.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

Activity 1: Promotion and development of the regional vessels record and improvement of national vessels records and licensing system in the region

Sub-activity 1.1: Development and management of database for regional vessels record

Follow up the discussion and commendation from the Experts Group Meeting on Fishing License and Boats Registration which held in 2012, the database of regional vessels record of 24 meters in length and over will be designed and developed through upload to use via TD website.

Sub-activity 1.2: Technical meeting for database management

The technical meeting will be organized. The selected/ nominated person who are involved in/and responsible for this activity in each Member Country will be invited to participate in the meeting or TD staffs who conduct in this database will visit each country to discuss and consult for development and management on database of regional vessels record of 24 meters in length and over in the region.

Activity 2: Strengthening of Port State Measures and other surveillance measures in the region

Sub-activity 2.1: Experts group meeting on Port State Measures and other surveillance measures in Southeast Asia

The Experts group meeting on Port State Measures and other surveillance measures will be organized to continue development of manual for implement PSMs activities which suitable in the region as follows the activities from activity in the year 2012. The expert team and resource persons who participate in the 1st meeting will be invited to participate in this meeting.

Activity 3: Production of information materials

Production on information and promotional materials such as VDO, poster, report and *etc.* related to counter measures to IUU fisheries activities would be carried out during the implementation of the project activities and disseminated to the SEAFDEC Member Countries and worldwide.

4.1 Planning of the Project Activities

Project/Activity Title	Duration
1. Promotion and development of the regional vessels record and improvement of national vessels records and licensing system in the region	
1.1 Development and management of database for regional vessels record	Jan-Dec 13
1.2 Technical meeting for database management	Jul 13
2. Strengthening of Port State Measures and other surveillance measures in the region	
2.1 Experts group meeting on Port State Measures and other surveillance measures in Southeast Asia	Aug 13
3. Production of information materials	Jan-Dec 13

4.2 Expected Outputs in the Year 2013

- Database of regional vessels record on 24 meters in length and over in the region by coordination and cooperation with Member Countries;
- The progress of PSMs implementation manual/ guideline for the region; and
- Common understanding of counter measure activities to reduce IUU fishing in the region



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Project Title:	Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2
Lead Department:	Training Department
Lead Country:	All Member Countries
Total Duration:	Since 2004

1. INTRODUCTION

In June 2002, the Government of Japan approved the construction of a fishery research and training vessel capable of conducting fishery resource and oceanographic surveys and training in coastal ASEAN waters, along with procurement of the requisite fishing gear, fishing machinery, and survey equipment. This was in response to resolution passed at the ASEAN-SEAFDEC Millennium Conferences¹, which highlighted the need for investigation of the potential fisheries resources, and establishment and implementation of comprehensive policies for innovative fisheries management in the region. The construction of a research vessel, M.V. SEAFDEC 2, was completed in 2003.

Since 2004, SEAFDEC Training Department (TD) has worked in close collaboration with the Member Countries and other relevant organizations on utilization for the use of M.V. SEAFDEC 2. The M.V. SEAFDEC 2 has supported the Member Countries in assessing and utilizing their fishery resources. In a border sense, the acquisition of M.V. SEAFDEC 2 will help strengthen technical cooperation and effective fisheries and environmental management in the ASEAN region through the enhancement of research capability.

As adopted at the 37th Meeting of the Council of SEAFDEC in 2005, operational cost of national research surveys was based on a cost-sharing policy until 2009 using the budget from SEAFDEC's Minimum Regular Contribution and the Member Countries.

Due to the globally increased oil price starting from the year 2006, consequently in early year 2009 this issue was discussed during the 40th Meeting of SEAFDEC Council. The Council agreed that the country that request to use M.V. SEAFDEC 2 should be responsible for the cost incurred by the vessel. It is therefore the cost-sharing policy was modified that the requested country(s) will be responsible for fuel consumption of the vessel for the entire duration of the research/survey including cursing to and back to the requesting country. This modified scheme has been used since 2010.

2. PROJECT

2.1 Objectives

- 1) Assist Member Countries to conduct fisheries resources survey (*i.e.* fishing trail and demonstration, oceanographic and hydro-acoustic surveys);
- 2) Assist Member Countries to build human resources capacity during the surveys on-board M.V. SEAFDEC 2 (fish preservation techniques, fish sampling and species identification, etc.) based upon the request; and
- 3) Support the establishment of the under-utilized fisheries resources in the EEZ of the Member Countries (*e.g.* coastal and offshore fisheries, un-trawlable areas, etc.)

¹ Referring to: (i) the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium "Fish for the People", 19-24 November 2001, Bangkok, Thailand; and (ii) the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 "Fish for the People 2020", 13-17 June 2011.

2.2 Project Description

To accomplish key activities as mentioned above, TD works in close collaboration with the Member Countries and other key partners at both national and regional levels. Over the years, The M.V. SEAFDEC 2 has been used for the survey of the fisheries resources in EEZ of the Member Countries. The vessel will also be used to implement the training programs.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
1. Fisheries resources survey in the member country: Vietnam	April	<p>Consultation visit to Vietnam for finalization of the research cruise plan of M.V. SEAFDEC 2 (see below here for more detail). Tentative plan and financial arrangement for the cruise plan of M.V. SEAFDEC 2 in Vietnam had been finalized. For the first year of this national program, it was planned that the cruise will be conducted in Vietnam water with a total of about 148 days, covering pre- and post-monsoon period.</p>
	May to July	<p>At the 43rd Meeting of SEAFDEC Council, 4-8 April 2011 in Malaysia, the Council Director for Vietnam proposed to use the M.V. SEAFDEC 2 for a five-year program of the national research survey for assessment of fisheries stock status in Vietnam waters, from 2012 to 2016. In this connection, a series of follow-up activities has been arranged for formulation a development of the technical cooperation between SEAFDEC and RIMF.</p> <p>Overall objective of the survey is:</p> <ul style="list-style-type: none"> • To carry out comprehensive assessment on the status of marine resources focusing for the marine capture fisheries in Vietnam to serve as the good scientific basis for future planning and management of fisheries in Vietnam towards the utilization of the resources and sustainable developments of fisheries. <p>Intermediate objectives of the survey are:</p> <ul style="list-style-type: none"> • To assess status of large pelagic fishery resources, including species composition, relative abundance, distribution, biological characters of the large pelagic species, targeting at yellow-fin, skipjack, and big-eye tuna, and tuna-like species; • To assess status of demersal marine fisheries resources in Vietnam waters, including species composition, relative abundance, distribution, biomass, stock status and biological characters of demersal species, targeting at shrimp, and mollusk; • To assess status of small pelagic fisheries resources in Vietnam waters using hydro-acoustic survey especially for stock status of scads, sardine, anchovy, and mackerel; and • To assess status of marine capture fisheries in Vietnam for further development of fisheries management plan based on information obtained from the cruise survey. <p>This collaboration between Vietnam and SEAFDEC will focus on the survey on status and trend of the small pelagic fisheries resources in Vietnam waters using hydro-acoustic survey especially for status of scads, sardine, anchovy, and mackerel.</p> <p>The main activities of the survey by M.V. SEAFDEC 2 in Vietnam waters each year are as follow:</p> <ul style="list-style-type: none"> • <i>Activity 1</i>: Hydro-acoustic surveys using multi-frequencies Simrad EK-60 (at 38 kHz, 120 kHz, and 200 kHz).



	<ul style="list-style-type: none"> • <i>Activity 2:</i> Species composition and biological study. During the surveys, bottom otterboard trawl, and mid-water trawl will be used to take samples for species composition and biological study of small pelagic resources. • <i>Activity 3:</i> Oceanographic and plankton surveys: ICTD, IKMT, Plankton nets, Temperature and Depth Sensor, Current Indicator, and other weather information. <p>The 1st cruise and 2nd cruise surveys in Vietnam water was conducted from 14 May to 23 July 2012, and 2 October to 13 December 2012, respectively.</p>
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3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

<p>(1) Theme: Fisheries resources survey</p> <p>(2) Issues in the region at the beginning of the study:</p> <ul style="list-style-type: none"> • Still under-utilized fisheries resources areas in the Southeast Asian region, including un-trawlable grounds, and deep-sea areas; • Human resource capacity of the Member Countries in the field of fisheries resources exploration is significantly needed; and • Facility in the Member Countries for conducting research cruise survey is still limited.

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • Information on potential fisheries resources in the un-trawlable area of the EEZ of the Member Countries is provided; and • Enhancement of the human resources capacity of the Member Countries on fishery resources survey is enhanced.

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Meeting with the requested country(s) for formulation and finalize the cruise survey plan of M.V. SEAFDEC 2.</p> <ul style="list-style-type: none"> • Meeting between SEAFDEC/TD and country requested for using M.V. SEAFDEC 2 to finalize the plan of activity of the cruise survey; and • Summarize report of the meeting and the tentative cruise plan.
<p>Step 2: Collaborative arrangement of SEAFDEC/TD and the requested country for the cruise survey.</p> <ul style="list-style-type: none"> • SEAFDEC/TD and the country proceed with all arrangement for the cruise survey; and • The activities of the cruise survey have been implemented as planned.
<p>Step 3: Result reporting.</p> <ul style="list-style-type: none"> • Results from the fisheries resources survey will be jointly drafted and released.

3.2.4 Activities in the current project:

<p>(1) Current position of the project: Step 1~3</p>
<p>(2) Project duration: 2004~</p>
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • Supporting fisheries resources survey (equipment and facilities in terms of fish sampling gear, oceanographic survey equipment, hydro-acoustic equipment, and etc.); and • Carry out on-the-job training program based upon the request and plan of activity with the country.

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project	
<ul style="list-style-type: none"> Supporting fisheries resources survey (equipment and facilities in terms of fish sampling gear, oceanographic survey equipment, hydro-acoustic equipment, and etc.); and Carry out on-the-job training program based upon the request and plan of activity with the country. 	
(2) Main achievements till the end of 2012	
<ul style="list-style-type: none"> National fisheries resources survey in the Member Country: Vietnam 	
(3) Outcomes during the project period and expected achievement rate till the end of 2012	
Expected outcome	Achievement rate (%)
National fisheries resources survey in EEZ of Vietnam	100%

3.2.6 Evaluation of project activities in 2012:

<p>More than 2 decades, technical cooperation between SEAFDEC and the RIMF in the area of marine fisheries resources, such as fishing gear technologies, coastal fisheries resources enhancement, post-harvest technologies, etc.</p> <p>The survey activities on-board M.V. SEAFDEC 2 for the national fisheries resources survey in Vietnam waters have been successfully implemented. Technical papers and results from the survey can be shared to other Member Countries. TD has planned to organize a regional technical meeting to provide the Member Countries a platform for presenting the results of the cruise survey in their EEZ waters conducted previously by M.V. SEAFDEC 2. Concerned Member Countries are requested to follow-up with TD through communication via email and from the information in the SEAFDEC website.</p>
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4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Second year of the fisheries resources survey in Vietnam waters using M.V. SEAFDEC 2	Pre-monsoon (to be finalize)	As mentioned above that the collaborative survey in the Vietnam water will be carried out from 2012 to 2016. However, the proposal of activities plan in 2013 will be readjusted based on the results from the 1 st and 2 nd survey cruises conducted in 2012. Thus, TD will finalize the survey plan using M.V. SEAFDEC 2 in consultation with RIMF. From the 2 nd year of this program, it is planned that only one survey cruise during the pre-monsoon period will be conducted.

4.2 Expected Outputs in the Year 2013

<ol style="list-style-type: none"> Results from the survey in Member Countries would be disseminated; Building human resource capacity of the Member Countries on the fisheries resources survey in the field of fishing/sampling gears, oceanographic survey equipment, and hydro-acoustic survey; and Draft plan for organization of the regional technical meeting to share data of the survey carried out previously by M.V. SEAFDEC 2.
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PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Project Title:	Deep Sea Fisheries Resources Exploration in Southeast Asia
Lead Department:	Training Department
Lead Country:	Thailand
Total Duration:	2008-2012 (completed)

1. INTRODUCTION

Due to the depletion of the inshore/costal fisheries resources in the Southeast Asian (SEA) countries, in conjunction with the fuel crisis that make many fishers suffering, some fishers have to stop their operation and change to other business. In other hand, this automatically reduces the fishing capacity in the sense, goes in line with national fishery policies in many countries. However, this depletion also reduce the supply of seafood materials to many fish processing industries in the region and will also reduce the food supply to the global market in the near future. In the point of view of fishery policy maker or government, searching of new fishing ground is one of the important research works under the national program. It is very much needs to get fully support in both funding and capacity building from government.

Considering the geographic features in the SEA waters, more than 50% of the sea areas are identified as deep sea areas, whereas utilization of those resources have yet been initiated. This is due to the lack of information on the species composition and how potential of the resources. In addition, it is clear that research vessels for deep-sea survey seem to be one of the major constraints that many countries in the region are facing with. There are not many research scientific instruments, type of fish sampling gears, and expertise. Therefore, modification of sampling gears for those research vessels is essential to encourage Member Countries to initiate the deep-sea resources exploration.

2. PROJECT

2.1 Objectives

- 1) Provide technical support of exploration of deep sea fisheries resources in the SEA waters by using M.V. SEAFDEC 2 to the Member Countries and/or by other research vessels in collaboration with the Member Countries; and
- 2) Build capacity of researchers of the Member Countries to be able to explore deep-sea fisheries resources with the basis of ecosystem approach to fisheries.

2.2 Project Description

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”, this project has provided technical support to the Member Countries in exploring the deep sea fisheries resources in their respective EEZ waters, and enhanced knowledge and understanding of the deep sea ecosystem.

SEAFDEC in close collaboration with the Member Countries has supported exploration of fishery/living resources in the deep-sea areas in EEZ of the countries in SEA. The overall aims of this program are: to encourage Member Countries to collect the information on the deep sea fishery resources in terms of research and training facilities using M.V. SEAFDEC 2; and to build human resources capacity for deep sea fishery resources exploration.

Various regional activities including a series of experts meetings, on-the-job training, and information dissemination on the deep-sea resources exploration in the Southeast Asian waters have been conducted. It is also envisaged that deep-sea scientists and fishery researchers in the region can discuss on the topic focusing on the deep sea considering vulnerable marine ecosystems. In addition, this project also provides a platform for regional important discussion on the issue related to the deep-sea fisheries resources of the region.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
Development/improvement of fish sampling gear and methods for deep sea resources survey	Aug~Oct	<ol style="list-style-type: none"> 1. Tested performance of the bottom mapping sonar equipped on-board M.V. SEAFDEC 2; 2. Improved capacity of underwater VDO and camera for benthic habitat mapping survey; and 3. Modified of the trawl fish sampling gears for using on-board M.V. SEAFDEC 2 supporting deep sea fisheries resources survey in the Member Countries.
Supporting deep sea fisheries resources survey	Apr~Jul	<ol style="list-style-type: none"> 1. Meeting with RIMF and D-FISH of Vietnam to finalize the financial arrangement and detail cruise plan for M.V. SEAFDEC 2 fishery resources survey cruise in Vietnam water in 2012; and 2. Supported researchers to assist RIMF to conduct pelagic and demersal fisheries resources survey, pre- and post-monsoon in Vietnam waters, two cruises in 2012.
HRD programs on deep-sea fisheries resources exploration	Dec	Organization of the regional training on benthic habitat mapping, scheduled in December 2012.
Information dissemination	Mar~Dec	Development, publication and dissemination of “ <i>Marine crab in Southeast Asia (100-370 meters)</i> ” poster. This initiative was based on the output of the Training Workshop on “Identification of Deep Sea Benthic Macro-invertebrate Vulnerable to Fishing Gear” organized at TD in July 2011, as technical collaboration between SEAFDEC/TD and Faculty of Fisheries of Kasetsart University, Bangkok Campus. The poster has been disseminated to the Member Countries since August 2012.

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Support exploration of fisheries resources in the deep sea areas, and encourage Member Countries to investigate impact of fishing activities to the deep sea ecosystem
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Significant depletion of inshore/coastal fisheries resources in the SEA Countries; • Approximately 50% of sea area in the region was identified as deep sea waters, whereas utilization of fisheries resources in the deep sea areas has yet utilized; • Inadequate technical information on the fisheries resources in the deep sea areas; and • Inadequate technical information on the impact of fishing activity to the deep-sea environment.

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • Information on fishery resources in deep sea areas in the SEA region; • Information on the possible impact of fishing activity to the deep sea ecosystem; and • A set of recommendations for the medium- and long-term development and management plan of activities for utilization of fishery resources in the deep-sea areas of the Southeast Asian waters.
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3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Data and information collection on the deep-sea fisheries resources and impact from fishing to the deep-sea ecosystem.</p> <ul style="list-style-type: none"> • Organization of workshop to compile “Standard Operating Procedure on Fisheries Resources Exploration in the Deep Sea Areas of the Southeast Asian region”; • Conduct/support deep sea fisheries resources exploration using M.V. SEAFDEC 2 and other national research vessels; • Organization of training workshop on the exploration methodology for the deep sea fishery resources; and • Development/improvement of fish sampling gears for the deep-sea fisheries resources survey in the Southeast Asian waters.
<p>Step 2: Data analysis and sharing experience among deep-sea researchers/scientist.</p> <ul style="list-style-type: none"> • Data analysis on the potential deep sea fishery resources as output from Step1; • Organization of the workshop on exploration methodology for the deep sea fishery resources; • Organization of training workshop on identification of deep sea fish; • Organization of training workshop on identification of deep sea macro-invertebrate; and • Organization of training workshop on benthic habitat mapping.
<p>Step 3: Information dissemination and establishment of the regional network on the deep-sea fishery.</p> <ul style="list-style-type: none"> • Establish a regional network on deep sea fishery; • Develop and formulate a set of policy recommendations for management plan at national and regional levels for utilization of the deep sea fishery resources in the SEA waters; and • Disseminate, sharing, and exchange information collected from the project’s initiatives with the Member Countries and other relevant organization/initiatives.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 1 to 3
(2) Program duration: 2007~2012
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • Support deep sea fishery resources survey; • R&D on fish sampling gears for the deep sea areas in the SEA waters; • Encourage the Member Countries to carry out study on the impact of fishery to deep sea ecosystem; • Organize training/workshop on the exploration methodology for the deep sea fisheries resources; and • Information dissemination.

3.2.5 Progress and achievements of the current project:

<p>(1) Main activities conducted in the current project</p> <ol style="list-style-type: none"> 1) Support deep-sea fishery resources survey using M.V. SEAFDEC 2, and other research vessels. 2) R&D on fisheries resources exploration in the deep sea areas of the SEA waters <ol style="list-style-type: none"> a) Design and construct deep sea fish sampling gears (including beam trawl, deep-sea trap, Isaacs-Kid Mid-water Trawl and Agassi trawl), and improvement of their sampling techniques; and b) Carry out deep-sea fisheries resources survey in collaboration with the Member Countries including Philippine, Malaysia, Vietnam, Brunei and Indonesia, using the fish sampling gears developed by the project. 3) Understanding the impact of fishery to deep-sea ecosystem. Information collection on the impact of the fishing through expert consultation and review of references/documents 4) Training/workshop on the exploration methodology for the deep sea fisheries resources survey <ol style="list-style-type: none"> a) Organization of ship-board training on deep sea exploration, R.V.D.A BFAR, Philippines; b) Organization of on-the-job training on collection, preservation and digital imaging technique for deep sea fish, Brunei Darussalam; c) Organization of the training workshop on identification of deep sea fish, SEAFDEC/TD; d) Organization of on-site training on technique for preparation of deep sea fish pictorial book, Brunei Darussalam; e) Organization of the training on research methodologies for study on impact of fishing on deep sea

<p>ecosystem, Brunei Darussalam;</p> <p>f) Organization of the training/workshop on identification of deep sea benthic macro-invertebrate vulnerable to fishing gear, SEAFDEC/TD;</p> <p>g) Organization of on-site training on identification of deep sea fish, Malaysia; and</p> <p>h) Organization of benthic habitat mapping on-board M.V. SEAFDEC 2, SEAFDEC/TD</p> <p>5) Information dissemination</p> <p>a) Disseminate information collected from survey of deep sea fishery resources to the Member Countries and other relevant initiatives;</p> <p>b) Publication on the review work on taxonomy of deep sea fish in the SEA waters;</p> <p>c) Publication of deep sea fish in Southeast Asian water distribute at 100-370 meter depth;</p> <p>d) Publication of deep sea fish in Southeast Asian water distribute at 300-1,200 meter depth;</p> <p>e) Publication of marine crab in deep sea area (100~370 m) in Southeast Asian waters; and</p> <p>f) Publication of Early Stages of marine Fisheries in Southeast Asian Region.</p> <p>6) Sharing and exchange knowledge with experts and scientists on deep sea fisheries resources and impact of fishing on deep sea ecosystem through various communications/meetings as well as project website: http://map.seafdec.org/DeepSea/</p>													
<p>(2) Main achievements till the end of 2012</p> <ul style="list-style-type: none"> • Data collection on potential deep sea fisheries resources through the cruise survey by M.V. SEAFDEC 2 and other research vessels; • A series of reports of the regional events organized by the current project; • Publication on standard operational procedure for deep sea resources sampling gears; • A set of information on deep-sea fisheries resources (specimens, guidebook, posters, leaflet, CDs, Web site, etc.); • A set of recommendations for future development of deep sea fishery in SEA waters; and • Developed and improved deep sea sampling gears in collaboration with experts. 													
<p>(3) Outputs during the project period and expected achievement rate till the end of 2012</p> <table border="1"> <thead> <tr> <th>Expected Outputs</th> <th>Achievement rate (%)</th> </tr> </thead> <tbody> <tr> <td>Support deep sea fishery resources survey in the deep sea areas in the Member Countries: Vietnam</td> <td>100%</td> </tr> <tr> <td>R&D on deep sea fish sampling gears</td> <td>100%</td> </tr> <tr> <td>Study on impact of fishing to deep sea ecosystem</td> <td>80%</td> </tr> <tr> <td>Training/workshop on the exploration methodology for the deep-sea fishery resources</td> <td>100%</td> </tr> <tr> <td>Information dissemination</td> <td>100%</td> </tr> </tbody> </table>		Expected Outputs	Achievement rate (%)	Support deep sea fishery resources survey in the deep sea areas in the Member Countries: Vietnam	100%	R&D on deep sea fish sampling gears	100%	Study on impact of fishing to deep sea ecosystem	80%	Training/workshop on the exploration methodology for the deep-sea fishery resources	100%	Information dissemination	100%
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3.2.6 Evaluation of project activities in 2012:

<p>Project continues to provide technical and facility supports to the Member Countries on their national fisheries resource survey in deep-sea areas. In 2012, two (2) surveys were conducted in collaboration with RIMF during pre- and post-monsoon in Vietnam waters. Technical publications will be jointly published. And technical data and information will be shared with the other Member Countries.</p> <p>After the 1st cruise survey of M.V. SEAFDEC 2 in Vietnam waters, the bottom trawl net sampling gears for the deep sea areas was modified based upon the requirement of the RIMF to compare the catch data with the hydro-acoustic survey data. Trial of the modified trawl net was carried out in the Gulf of Thailand in September 2012. It was planned that this modified high-mouth-opening trawl net can be effectively used for pelagic and demersal sampling during the 2nd cruise of M.V. SEAFDEC 2 in Vietnam waters, and also for other Member Countries.</p> <p>In follow-up to the recommendations made through the series of activity on understanding the possible impact of fishing on benthic habitat, the project had prepared and organized the regional training course on benthic habitat mapping. It was envisaged that the participants will be able to conduct the similar exercise for the survey in their respective countries.</p>

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

No activity proposed for 2013 as the project will be completed in 2012.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Project Title:	Information Collection on Highly Migratory Species in Southeast Asian Waters
Lead Department:	Training Department
Lead Country:	Philippines
Total Duration:	2008-2012 (completed)

1. INTRODUCTION

Tuna fishery in the Southeast Asian waters is significantly important for the domestic consumptions as valuable protein resource for most of the countries in the region as well as for exports to the many parts of the world. Due to the decline of tuna stock in the high seas, the attempt of tuna Regional Fisheries Management Organizations (RFMOs) was made to estimate tuna stocks at the global level. However, based on the current tuna fisheries statistics in Southeast Asia, there is also a need to know how much tuna approximately captured in EEZ waters because the inclusion of tuna raw materials imported from overseas into their tuna statistics. However, catch trend of coastal tuna resources showed declination recently. This could be because of the failure in managing coastal fishing capacity due to the inadequate information for appropriate policy development to manage the tuna fisheries.

The project initiated information collection of highly migratory species in the Southeast Asian Waters since 2008 with specific objectives to review and evaluate status of tuna fisheries/productions in the Southeast Asian waters as well as to develop the regional tuna database with the basis of data collected at the tuna landing sites together with the national fisheries statistics. Activity on development of tuna data logbook and system for supporting the tuna information collection is also included in the project. There are four (4) countries participating in this project, namely Indonesia, Philippines, Thailand and Vietnam (IPTV-Countries).

The existing system and mechanism for collecting tuna catch data at the national level and ways to improve tuna data collection in their respective countries were discussed at the 1st Working Party Meeting organized by the project. It was found that level of national development in the IPTV countries for tuna information collection is significantly different. Regarding this, annual plans of activities for 2009 were identified for each participating country at the 1st meeting. Tuna landing sites and the enumerators of each country were also clarified before starting the support from project for collecting tuna catch data.

During the 2nd Working Party Meeting, a 10-year tuna catch data from 1997 to 2007 based on fisheries statistic of all relevant countries were submitted and reported by the countries. Another progress was the outcome of data collection at selected landing sites in each IPTV countries based on 6 to 8 months implementation. In addition, it was concluded that one-year-cycle of information collection on tuna catch landing at the selected landing sites with the financial support from the project should be completed. To achieve this goal, the project plan and activities from late 2009 till early of 2010 was to finalize the future activities for IPTV countries including the developing of fishing logbook or catch documentation system to support proper tuna data collection.

At the 3rd Working Party Meeting in 2010, IPTV countries were requested to present their progress of work on data collection by enumerators at the selected tuna landing site since 2008 as well as to finalize the future plans and activities to be implemented by each countries based on the current situation. The meeting finally concluded that the project activities should promote the use of tuna fishing logbook in order to obtain more reliable information. Furthermore, the meeting also suggested the project to put more efforts in setting up minimum requirement of information collection through the use of fishing logbook.

The special meeting on improvement of tuna information and data collection in Southeast Asia was convened in Thailand in September 2011. Objective of this meeting was to gather ideas on how to deal with tuna statistics: gaps and constraints in collecting tuna information/statistics can be identified, future data collection and information gathering can be improved, and regional plan for supporting tuna statistics can be developed. Based on the outputs from the meeting, followings issues and concerns were identified:

- Common issues and concerns;
- Data collection at sea, landing site, and tuna canneries;
- Data processing and reporting; and
- Recommended follow-up actions by SEAFDEC and others

2. PROJECT

2.1 Objectives

- 1) Obtain better understanding on trend of tuna catch in IPTV countries; and
- 2) Improve information collection on tuna in Southeast Asian countries.

2.2 Project Description

To develop tuna fisheries in the region in the sustainable manner, there is the need to enhance national capacity to improve/establish tuna information collection for planning and management of the tuna fisheries resources, and also to be able to submit a qualitative data to the tuna RFMOs. However, tuna fishery statistics is still developing in most of the countries in the region. In this connection, main objective of this project is to reduce the development gap through various capacities building program aiming at supporting the Member Countries to produce reliable information on tuna catch.

The activities implementing under this project focus on the works with IPTV countries. Tuna information on the origin of the tuna and neritic tuna species caught (at the selected landing sites in the IPTV countries) is now investigated by using one-year-cycle data collected by the countries based on the framework of activities developed at the beginning of the project. As suggested by IPTV countries, it was recommended that pilot program on the use of tuna fishing logbook will be developed in close consultation with the countries considering the current situation of each IPTV country. However, due the limitation of the budget and period of the project, this initiative will be maintained at TD for further useful to the Member Countries and other relevant initiatives.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
1.Consultation/working party meeting	-	-
2.Improvement of tuna information	Feb	Organization of the “ <i>National Training on Improvement of Data Collection for Tuna Gillnet and Purse seine Fisheries in Vietnam</i> ”, 20 to 22 February 2012, Binh Dinh, Vietnam. Major outputs from the training include: 1. Encouragement for establishment of national protocol and mechanism for port sampling data collection, analysis, and reporting of the tuna catch data for gillnetters and purse seiners in Vietnam, under the responsibility of D-FISH and RIMF of Vietnam. 2. Supporting human resources capacity building of D-FISH and Provincial Officials in major tuna landing sites of Vietnam for collecting data from tuna gillnetters and purse seiners at major tuna landing sites in Vietnam, including Binh Dinh, Phu Yen, and Khanh Hoa.

	April	<p>Project staff participated to the “1st Vietnam/WCPFC Annual Tuna Fisheries Catch Estimate Workshop”, 2-6 April 2012, Da Nang, Vietnam.</p> <p>The project staff joined the discussion between DEACAFIREP and WCPFC for improvement of estimations for tuna annual catch data. Harmonizing the efforts on improvement of tuna information collection in Vietnam between SEAFDEC and WCPFC was discussed at the meeting.</p>
	July	<p>Organization of the “Training Workshop on Monitoring Tuna Catch Data at Tuna Canneries”, from 2-6 July 2012, Nha Trang, Vietnam. Fisheries inspectors and officials of the Member Countries (including Indonesia, Malaysia, Philippines, Thailand, and Vietnam) participated to the training.</p> <p>Capacity of the human resources of the countries was enhanced for checking accuracy of tuna species identification at the canneries, especially for the small juvenile of yellow-fin and big-eye tunas in frozen condition. Handbooks for checking accuracy of tuna species identification at the tuna canneries was prepared and disseminated at the training with the technical cooperation and support from WCPFC/FRA-Japan. It was planned that the project will follow-up with the countries to monitor the effectiveness of the project implementation.</p>
	Nov	<p>Organization of the onsite training on improvement of tuna information collection at tuna canneries: Thailand, 5 days training course scheduled in Nov 2012.</p> <p>This activity plans is a follow-up activity discussed during the regional training course organized in Nha Trang in July 2012.</p>
3.Data collection and analysis	Jan~June	<p>Preparation of the reports of the activities organized under this project in late 2011.</p> <p>Dissemination of the following publications has been made:</p> <ol style="list-style-type: none"> 1. Report of the Special Meeting on Improvement of Tuna Information and Data Collection in Southeast Asia, Songkhla Province, Thailand, 7-9 September 2011. 2. Report of the Special Meeting on Sharks Information Collection in Southeast Asia, Bangkok, Thailand, 15-17 September 2011.

3.2 Evaluation of the Program Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Fishery management of shared stocks in the Southeast Asian waters

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

- Tuna catch landed in most of the Member Countries are not actually represent the current situation of tuna resources stock status due to poor quality of data collected at on-board tuna fishing vessels, landing sites, and canneries. For example in Vietnam, national tuna data collection and reporting system is just ongoing development while Vietnam exported several then thousand MT annually.
- Need to separate data of tuna catch from EEZ and beyond EEZ for better managing the tuna fisheries resources.

3.2.2 Expected final goals of the project:

- Better understanding on the status of tuna capture fisheries in the Southeast Asian waters

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Establish a Working Party of the project participating countries and conduct annual meeting.</p> <ul style="list-style-type: none"> • Establish the working group party to work on tuna data collection at national level. There are four (4) countries participating to the project as major countries exporting/producing tuna; namely Indonesia, Philippine, Thailand, and Vietnam (IPTV countries); and • After establishment of the working group party, the project supported the participating countries one-year-cycle tuna information collection at their major landing sites.
<p>Step 2: Data collection and analysis for IPTV countries.</p> <ul style="list-style-type: none"> • Identify the landing sites for data collection; hire enumerator to monitor and record the catch landing at the selected sites; • Analysis on the status of tuna resources in the Southeast Asia waters based on tuna production by countries, by species; and • Provide a set of technical data for further consideration by the country(s) for improvement of information collection on tuna catch in their respective country(s).
<p>Step 3: Regional analysis on tuna production at the landing sites.</p> <ul style="list-style-type: none"> • Data submitted by IPTV countries representatives were analyzed regionally in order to estimate total production of tuna landed in IPTV countries; and • Data from the landing sites of the IPTV countries were compiled and grouped into sub-area for summarizing tuna catch data in each sub-area.
<p>Step 4: Consultation and information dissemination.</p> <ul style="list-style-type: none"> • The evaluation on the result from the project implementation will be made through the organization of the regional technical consultation; and • Dissemination of the outcomes of the project implementation.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 4
(2) Project duration: 2008-2012
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • Organize working party meeting; • Regional synthesis on tuna fisheries in IPTV countries was conducted; and • Developing regional tuna statistics.

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project	
<ul style="list-style-type: none"> • Assist the Member Countries to improve quality of tuna catch data; and • Initiate development of area or sub-area tuna database 	
(2) Main achievements till the end of 2012	
<ul style="list-style-type: none"> • Encourage establishment of the mechanism for tuna data collection system at major tuna landing sites in Vietnam; and • Update and disseminate information on international fisheries issues related to tuna to the Member Countries 	
(3) Outputs during the project period and expected achievement rate till the end of 2012	
Expected Outputs	Achievement rate (%)
Formulation of the Working Party on information collection of tuna fisheries from concerned Member Countries	100%
Support improvement of tuna information collection of the Member Countries through human resources capacity building activity	100%
Data set of tuna catch data in IPTV countries	100%
Analysis of the status and trend of tuna catch	100%
Updating information on tuna catch data in the region and dissemination of information to Member Countries and relevant agencies.	100%



3.2.6 Evaluation of project activities in 2012:

In 2012, the project staff involved in the process for establishment of national mechanism for collecting and reporting tuna information in Vietnam initiated by WCPFC. In addition, human resources capacity building of the Member Countries for improvement of tuna information collection through the regional training program has been provided with the technical cooperation of the Fisheries Research Agency of Japan.

As of 2012, the project could obtain a data set of tuna catch landed in major tuna landing sites of the IPTV countries. The effort to develop a regional framework for tuna fisheries database with the basis of data inputs by the IPTV countries has been initiated. However, data from project non-participating countries, such as Myanmar and Malaysia, should also be accommodated in the future for better clear picture of tuna catch landing in the area or sub-area as mentioned above. This is due to the fact that there is still a developing gap of the countries in the region in collecting information, which is mainly caused by insufficient financial and human resources.

Communication among the working party of this project, relevant regional/national initiatives and agencies will be maintained even through the project termination by 2012. Technical information collected by IPTV countries will be shared with other existing framework, network and mechanism at the regional level.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

No activity proposed for 2013 as the project will be completed in 2012.

PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Project Title:	Development of Regional Database for Fisheries Management
Lead Department:	Training Department
Total Duration:	2008-2012 (completed)

1. INTRODUCTION

Standardization of the data and information of national fisheries data input are needed for efficiently use of the regional databases of the SEAFDEC Member Countries. Appropriate fisheries database system can then facilitate and generate reporting process. SEAFDEC Training Department (TD) has initiated and developed the regional database and its system based on: (i) fisheries statistical bulletin for the South China Sea; and (ii) the harmonized framework and format of fisheries data reporting with FAO on fisheries statistics for the Southeast Asia. Under the new framework, TD has provided services on data input to the database system using the data submitted from the Member Countries since 2008. TD also assists MFRDMD to develop the database system for the tagging program for economically important pelagic species in the Southeast China Sea and Andaman Sea.

2. PROJECT

2.1 Objectives

- 1) Maintain/improve the regional database services including regional fisheries statistics and tagging database to support its data analysis; and
- 2) Enhance human resources capacity of the Member Countries on the use of the regional fisheries statistics and databases particularly for the less developed countries in Southeast Asia.

2.2 Project Description

Activities have been implemented in line with the Resolution (RES) and Plan of Action (PoA) on Sustainable Fisheries for Food Security for the ASEAN Regional Towards 2020 as follow:

RES # 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”.

PoA # 3: “Strengthen national statistical mechanisms for fisheries and aquaculture and the exchange of statistical data and related information. Include other non-routine data and information such as fish consumption surveys as well as mobilizing local and indigenous knowledge with the aim of improving the valuation of fisheries and monitoring their performance...”

PoA # 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.”

PoA # 5: “Coordinate, decentralize and enhance the sharing of relevant statistics and information of fisheries related statistical data and information between the national fisheries and other authorities including those responsible for food security, environment, trade, aquaculture, water resources, agriculture/forestry, wetlands, migration/employment and rural development”.

Program of activities implementing under this project includes maintenance and improvement of regional fisheries statistics for Southeast Asia covering statistical data of the previous format and the new harmonized statistical framework 2009 and onward. In addition, various human resource capacity

building programs (e.g. training on the use of database software for management of fishery data and information collected at landing sites) for the database developer of the Member Countries are also included under this project.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
Develop and maintain the regional database	Jan.-Dec.	1. Maintaining the system of the database for SEAFDEC regional fisheries statistics implementing by the Secretariat. 2. Maintaining the system of database for the regional tagging program for small-pelagic implementing by MFRDMD.
Building human resources capacities for utilization of the database	Nov.	Organization of the training for database developer of Brunei Fisheries Department, tentatively scheduled in November 2012. The main training program is to train for application of “fish landing data system” program.
Collaboration with other relevant initiatives	March	Technical staff of TD participated to the BOBLME Workshop “ <i>Fisheries Statistical Working Group</i> ” to support development the regional and sub-regional fisheries managements.
Information dissemination	Feb.-Dec.	Dissemination of information related to database through participation of staff at relevant meetings, and SEAFDEC website.

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Information collection for sustainable fisheries in the South China Sea and Andaman Sea.
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Inadequate regional program/activity related to fishery statistics and database for management of fishery resources in South China Sea and Andaman Sea; • Inadequate information and poor data for pelagic fishery resources management in South China Sea and Andaman Sea; • Fishery statistics, including information/data collection, data analysis and dissemination required improvement; and • Inadequate human resources capacity at national level in using fishery information and database for sustainable fishery management, particular to less developed countries in the region.

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • Established/improved database system of regional fisheries statistics; • Improved national fishery statistics (based on the request of the Member Country); and • Enhanced human/institutional capacity in using fishery information and database.
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3.2.3 “Steps” toward achieving final goals:

Step 1: System development and capacity building for human and institutional resources <ul style="list-style-type: none"> • Develop and promote the regional database on fishery resources in South China Sea and Andaman Sea using data collected from the research surveys, fish landing sites, and review on available information; • Develop and improve national and regional fishery statistics system to support less developed countries in the Southeast Asian region; • Enhance human and institutional capacity for using of the regional database; and • Strengthen collaboration and coordination with other relevant initiatives to avoid duplication of the efforts.
Step 2: Develop and maintain: <ul style="list-style-type: none"> • Database of regional fisheries statistics and tagging program on small pelagic to support data analysis.

Step 3: Information dissemination and continue promotion on the use of regional/national database

- Provide online database service to support the less developed countries in the region in order to improve their fishery resources.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 2~3

(2) Project duration: 2008~2012

(3) Main activities:

- Develop and maintain regional database;
- Build human resources capacity for utilization of the database;
- Collaboration with other relevant initiatives, organizations, and partners; and
- Information dissemination.

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project

- Develop and maintain regional database.
 - Hired an assistance database administrator; and
 - Setup internet system for database service.
- Build human resources capacity for utilization of the database.
 - Organization of the onsite training on the use of database for pelagic resources to analyze fish landing data for fishery officers of Cambodia, 16-20 Feb 2009;
 - Organization of the onsite training on the use of database for pelagic resources, Brunei Darussalam, November 2010; and
 - Organization of the human capacity building program for Brunei to install and test application of “Fish landing data system” in their routine data collection scheduled in November 2012.
- Collaboration with (i) relevant initiatives, organizations and partners; and (ii) tagging program of MFRDMD.
- Information dissemination.
 - Distribution of the media for database exchange and promotion of the work/output from this program.

(2) Main achievements till the end of 2012

- Maintaining of the system of the database for the regional fisheries statistics of SEAFDEC;
- Maintaining a system of database for the regional tagging program for small-pelagic;
- Technical staff of TD participated to BOBLME Workshop “Fisheries Statistical Working Group” to support development of regional and sub-regional fisheries management plans; and
- Organizing of the on-site training on “*Fish Landing Data Management System*” in Brunei Darussalam.

(3) Outputs during the project period and expected achievement rate till the end of 2012

Expected Outputs	Achievement rate (%)
Database development	100%
Enhance human capacity on utilization of the fishery database	80%
Information dissemination	80%

3.2.6 Evaluation of project activities in 2012:

The development of the regional database for tagging program of pelagic fisheries resources was completed. The national coordinators of the project are now providing input and update, the query data online at http://map.seafdec.org/tagging/tagging_adm.php. Regarding the Fisheries Statistic for Southeast Asia, the input by TD to the database system based on data submitted by the Member Countries was already finished for the data set of 2010. It is envisaged that online fisheries statistics will be more widely used in supporting planning and management of fisheries in the Member Countries. See more detail of this activity at <http://fishstat.seafdec.org>. Web-based information of the results from the cruise surveys previously carried out by M.V. SEAFDEC and M.V. SEAFDEC 2 has been developed and provided in mapping format. It is now available at http://map.seafdec.org/cftd/mv_seafdec/index.php for the survey data of M.V. SEAFDEC, and at http://map.seafdec.org/cftd/survey_mv2/mvseafdec_2.php for the survey data of M.V. SEAFDEC 2.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Project Title:	Improvement of Information Gathering System for IUU Fishing Related Countermeasures in the Southeast Asia
Lead Department:	Training Department
Total Duration:	2008-2012 (completed)

1. INTRODUCTION

Based on FAO's definition, illegal fishing is "fishing in contravention of the laws and regulations of a country or an international agreement". The declining fish stocks may be pushing the fishers to operate illegal fishing within and beyond their EEZ. It is widely accepted that illegal fishing is considered a major problem for future global food security, driven by substantial world population growth, continuously increasing demand for fish protein, even with large numbers of the world's fish stocks are currently being depleted.

The situation is similarly happening in every region in the world including the Southeast Asian region, which is currently responsible for one-fourth of the global marine fish production contributing about 14 million tons of fish products. It has been remarkably shown that the increasing demand for fish products as well as rapid growth of fishing capacity and development of modernization in fishing technologies and practices resulted in the over-exploitation of fisheries resources in the Southeast Asia. Nonetheless, the demand for fish by the existing fisheries industries is still increasing, which in a way leads to the increased number of fishers and vessels, and intensity of fishing aiming to meet the soaring demand. This in turn, has set off the practice of illegal fishing both inside and outside the Southeast Asian waters.

The project activity has been implemented in line with the Resolution (RES) and Plan of Action (PoA) on Sustainable Fisheries for Food Security for the ASEAN Regional Towards 2020:

PoA # 21: "Strengthen 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 promote the awareness and understanding of international and regional instruments and agreements through information dissemination campaigns"

In this connection, the project provides and initiates a set of activities focusing on improvement of the information gathering at national and regional levels for further revision of the IUU fishing related countermeasures.

2. PROJECT

2.1 Objectives

- 1) Improve fisheries information gathering system/mechanism through various capacity building programs for improvement of IUU-fishing related countermeasures in Southeast Asian countries;
- 2) Obtain better understanding and knowledge of fisheries in the region particularly on small-scale coastal and inland fisheries towards achieving sustainable fisheries development in the Southeast Asian Region;
- 3) Improve compilation of information and statistics on small-scale coastal and inland fisheries in the Southeast Asian; and
- 4) Facilitate better presentation and knowledge on status and condition of small-scale coastal and inland fisheries at national and regional level.

2.2 Project Description

Activity1. Improvement of Information Gathering to Support the Improvement of IUU fishing Related Countermeasures

IUU fishing is considered one of the most serious threats to the sustainable development and management of fisheries. EU catch documentation scheme is an example of the current market measures taking place with the mainstream to combat the IUU fishing. Before the EU catch documentation scheme taken effective actions by January 2010, all countries in the region have to build their institutional and human resources capacities in order to response to the measures of the EC. In addition, it is foreseen that there are increasing trends of similar market-oriented measures that moving towards effectively management of fishing capacity particularly to improve the IUU fishing countermeasures.

Various national capacities to collect national information are therefore needed in order to obtain qualitative data for proper management of the fisheries resources. In this connection, main objective of this program is to enhance their capacity to improve and produce quality and timely fishery information. Furthermore, the project will also facilitate exchanging of information among countries on the implementation of catch certification systems of the ASEAN Member Countries as required by European Commission, as well as harmonizing export of fishery products to other regions.

Specific objectives of this sub-project are to:

- 1) Review and update information on initiatives and program of activities that being implementing for combating IUU fishing in the Southeast Asian region;
- 2) Improve accuracy and reliability of fisheries information to support improvement of fisheries management including IUU fishing countermeasures; and
- 3) Enhance better understanding of the impact from IUU fishing on fisheries resources

Activity2. Improvement of Information Gathering on Small-scale Coastal and Inland Fisheries Towards Sustainable Fisheries Development in the Southeast Asian Region

In the Southeast Asian Region, Inland Fisheries is one of main fisheries production and more socially and economically, not only marine fisheries. People rely on the waters of the river, reservoir, lake and etc system to provide them with their primary source of nutrition and as well their livelihood. Sustainable development of the fisheries resources need to enhance various national capacities to collect national information for example in catch data information collection for proper management of the fisheries resources and to obtain qualitative data. Fisheries statistics and information is widely accepted as a tool to provide a basis and being crucial to the determination of national fisheries policies, the formulation of national management frameworks and actions or even as a basis for understanding the status and condition of fisheries resources. The need for accurate, timely and reliable statistics and information for the formulation and evaluation of fishery programs and policies has inevitable expanded manifold for development and management purpose.

In this connection, main objective of this program is to enhance the national capacities in order to be able to improve or produce quality and timely fishery information in Inland fisheries. The statistic and information in Inland fisheries is difficult and complex, because of the diversity of the yield, the dispersed geographic of many fisheries, and the range in scale of different types of fisheries. Therefore, estimates of the yield (production) and value of inland fisheries are needed to improve and develop material for capacity building through compilation of available existing tools and methodologies for maximizing its utilization for planning and management of fisheries at national and regional levels while maintaining the linkage and cooperation in the harmonization of norms/standards definitions and classifications of fishery statistics and information at regional and international levels.

Activity3. Improve Information Gathering of Tuna Catch Data of the Member Countries and Support Improvement of IUU fishing Countermeasures for Tuna Fisheries

In Southeast Asian region, it was recognized that inadequate information to assess stock status of tuna fishery resources in EEZ waters of the Countries in this region. It is therefore the need to have better understanding on stock status, fishing area, fishing effort/capacity, and catch landing of tuna. In addition, there is currently increasing international concern on IUU fishing activities, trading endangered aquatic species, which include tuna fisheries. In this connection, the activities under this category aim to support improvement of the tuna data/information collection in order to encourage tuna exporting countries in the region for long-term sustainable management and development of the tuna fisheries.

Under this program category, various capacities of the Member Countries will be built for improvement of data quality on tuna catch. It is envisaged that the countries could obtain more reliable and timely data for further management of the tuna fisheries in their respective countries. Activities to be implemented under this activity include improvement of information collection at-sea fishing activities, landing sites, and processing plants.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
1. Improve information gathering system to support the improvement of IUU fishing countermeasures in Southeast Asia	June	Project staff participated to the “ <i>Expert Group Meeting on Combating IUU fishing</i> ”, from 25 to 28 June 2012, Bangkok, Thailand. Development of the regional records for fishing vessels of the Member Countries had been discussed. The regional framework of the fishing vessels records is drafted and agreed at the meeting.
2. Improve information gathering on small-scale coastal and inland fisheries towards sustainable fisheries development in the Southeast Asian Region <i>Sub-activity 1:</i> Organization of the special meeting with fisheries officials in Cambodia, Lao PDR and Myanmar to improve tool and methodology for collection and compilation of information and statistics on inland fisheries, and summarized the national workshop. <i>Sub-activity 2:</i> Organization of the national workshop to improve tool and methodology for collection and compilation of information and statistics on small-scale coastal and inland fisheries in Cambodia, Lao PDR and Myanmar.	12-15 February 2012 19-22 March 2012 27-30 March 2012 9-13 July 2012	<ul style="list-style-type: none"> • Local Workshop on Compilation of Fisheries Information and Statistics on Inland fisheries at Pursat Province, Cambodia. • Local workshop on compilation of fisheries information and statistics on inland fisheries at Vientiane, Lao PDR. • Local Workshop on compilation of fisheries information and statistics on Inland Fisheries at Yangon, Myanmar. • Training course on Practical Approach to Rights-based Fisheries Management in Coastal Areas of Vietnam.

3. Improve information gathering on tuna catch data of SEAFDEC Member Countries and support the improvement of IUU-fishing countermeasures for tuna fisheries	Sept~	Two (2) meeting reports for the support of the improvement of tuna information collection were published and released, namely “Report of the Special Meeting on Tuna Information and Data Collection in Southeast Asia, 7-9 September 2011, Songkhla, Thailand”, and “Report of the Special Meeting on Sharks Information Collection in Southeast Asia”.
	Oct.	“Regional Expert Meeting on Commercially-exploited Aquatic Species: Sharks” will be jointly organized with the SEAFDEC Secretariat, scheduled from 29 to 30 October 2012 in Bangkok, Thailand.

3.2 Evaluation of the Project Outputs Till the Year 2012

Activity 1 and 3

3.2.1 Theme and issues:

(1) Theme: Support improvement of IUU fishing related countermeasures in the Southeast Asian Region through improvement of information gathering system/mechanism
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Inadequate fisheries information to support fishery management, particular for management of fishing capacity (boats, people, gears, standard and safety onboard fishing boats, illegal fishing gear, illegal fishing operation, etc.); • Various actions needed for combating IUU-fishing in response to: resources declination; poverty at local/community level; ineffective fishing regulation/countermeasures; weak in-country coordination; IUU-fishing activities frequently occurred in the neighboring countries; and • Need to improve capacity of the researchers to transfer fact-findings for science-based policy development for actions.

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • Support the establishment of an effective information gathering system/mechanism to improve IUU fishing related countermeasures in the Southeast Asian region; and • Support establishment of inventory/database system for monitoring and recording movement of fishing vessels/activities in the Southeast Asian region
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3.2.3 “Steps” toward achieving final goals:

Step 1: Collect information on identification of priority issues and gaps towards development of a regional fishing vessels record to support the improvement of IUU fishing countermeasure in the Southeast Asian countries.
Step 2: Assist regional initiative on sharing and disseminating information on the movement of fishing vessels in the Member Countries.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 2
(2) Project duration: 2011-2012
(3) Main activities: <ul style="list-style-type: none"> • Participate to regional/national technical consultations/meetings; and • Assist regional initiative on sharing and disseminating information on the movement of fishing vessels in the Member Countries.

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project	
<ul style="list-style-type: none"> • Participate to regional/national technical consultations/meetings; and • Assist regional initiative on sharing and disseminating information on the movement of fishing vessels in the Member Countries. 	
(2) Main achievements till the end of 2012	
<ul style="list-style-type: none"> • Participation in the process of fishing vessel record development for the Member Countries. 	
(3) Outcomes during the project period and expected achievement rate till the end of 2012	
Expected Outputs	Achievement rate (%)
1. Regional record of fishing vessels in Southeast Asia	(referring to the rate of the achievement of the main project)

3.2.6 Evaluation of project activities in 2012:

Activity 1 and 3

Under Activity 1, no activities implemented in 2012
 Under Activity 3: Project staff has involved in the process among the regional and national experts for development of fishing vessels record. The key recommendation was to establish the regional record on fishing vessels. As there are quite a number of activities and initiatives related to IUU fishing in the region, the main activity of the project was only to coordinate and provide technical assistance in developing database/information system to support improvement of information to combat IUU fishing.

Activity 2

3.2.1 Theme and issues:

(1) Theme: Improvement of Information Gathering on Inland Fisheries Towards Sustainable Fisheries Development in the Southeast Asian Region
(2) Issues in the region at the beginning of the study:
<ul style="list-style-type: none"> • The requirement from SEAFDEC Conference to strengthen of fishery statistics and maximizing their use for fisheries planning and management, as well as development of standard definitions and classifications to facilitate regional fishery statistics and information exchanges; • Insufficient standard of tools and methodologies for collection and compilation of information and statistics on Small-scale Coastal and Inland Fisheries in Southeast Asian Region; and • Insufficient fishery statistics and information on Small-scale Coastal and Inland Fisheries in Southeast Asian to provide a basis and being crucial to the determination of national fisheries policies, the formulation of national management frameworks and actions or even as a basis for understanding the status and condition of fisheries resources.

3.2.2 Expected final goals of the program:

- Improvement of the tools and methodologies for collection and compilation of information and statistics on Small-scale Coastal and Inland Fisheries for Member Countries;
- Maintaining the linkage and cooperation in the harmonization of norms/standards definitions and classification of fisheries statistics and information at regional and international levels; and
- Fisheries Officials of Member Countries have improved skill and knowledge on collection and compilation of information and statistics on Small-scale Coastal and Inland Fisheries.

3.2.3 “Steps” toward achieving final goals:

Step 1: Study on the document/material/media on tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries of the Southeast Asian Region.
<ul style="list-style-type: none"> • Identification the tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries in Southeast Asian Region; • Organization of the consultation meeting resource person and SEAFDEC; and

<ul style="list-style-type: none"> • Improvement the draft of tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries is reported.
<p>Step 2: Preparatory for a National Workshop in the targeted Member Countries</p> <ul style="list-style-type: none"> • Organization of the national technical consultation meeting; and • Discussion in detail of draft tools for collection information on small-scale coastal and inland fisheries, and summarized the national workshop in target Member Countries.
<p>Step 3: National Workshops on collection and compilation of information and statistics on small-scale coastal and inland fisheries</p> <ul style="list-style-type: none"> • Organization of the national workshop in target Member Countries; • The final of tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries of each country is reported; • Organization of the regional workshop on tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries; and • Tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries in Southeast Asian Region is reported.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 1
(2) Project duration: 2011 to 2015
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • Identification the tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries in Southeast Asian Region; • Organization of the national technical consultation meeting; and • Organization of the national workshop in target Member Countries.

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project	
<ul style="list-style-type: none"> • Identification the tools and methodologies for collection and compilation of information and statistics on inland fisheries in target Member Countries (Cambodia); • Discussion in detail of draft tools with resource person (DOF Thailand); and • Organization of the national technical consultation meeting on November 2011 at Cambodia 	
(2) Main achievements till the end of 2012	
<ul style="list-style-type: none"> • Draft of tool and methodologies for collection and compilation of information and statistic on inland fisheries of Cambodia is reported; • The draft of tools will be discussed at the national technical consultation meeting; and • The period of national workshop to improve tool and methodology for collection and compilation of information and statistics on inland fisheries will be assign by consultation meeting. 	
(3) Outputs during the project period and expected achievement rate till the end of 2012	
Expected Outputs	Achievement rate (%)
1. Identification the tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries in target Member Countries.	50%
2. Establishment of the appropriate tool and methodology for collection and compilation of information and statistics on small-scale coastal and inland fisheries in target Member Countries.	50%
3. Enhance fisheries officials in target Member Countries on tools and methodologies for collection and compilation of information and statistics on inland fisheries.	50%
4. Establishment of the tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries in Southeast Asian Region.	30%



3.2.6 Evaluation of project activities in 2012:

Activity 2

Cambodia was limited budget and resource persons on data collection, and need to set up the data collection on inland fisheries, which SEAFDEC will be provided the training course to fisheries officers.

Lao PDR has improved the questionnaire for more suitable with Lao PDR situation. DLF's officers need training course on data compilation and analysis.

Myanmar had Guidelines and standard method of data collection and fisheries indicators for fisheries management in Myanmar was developed by the Department of fisheries of Myanmar in coordination with SEAFDEC/TD. The main problem on data collection in Myanmar is the officer lack of data analysis knowledge, therefore, the training course on data compilation and analysis should provide to transfer knowledge needed to the officers for effectively data collection in the future.

Training on site at Vietnam, most participants expressed their satisfactory to the training course, but local officers should be developed more the sentences or wording of presentation for local level. The most important factor in presentation is how to raise the interest of participant and keep their concentration through questions to lead the appropriate answer. If we make a one-side lecture by presenter, the participants will feel boring and sleeping.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

No activity proposed for 2013 as the project will be completed in 2012.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Program Title:	Tagging Program for Economically-important Pelagic Species in the South China Sea and Andaman Sea
Lead Department:	MFRDMD (in collaboration with TD)
Lead Country:	Malaysia
Total Duration:	2008-2012 (completed)

1. INTRODUCTION

It is believed that pelagic fishes migrate for their ecological demand of spawning and feeding habits to the optimum environmental conditions on current, water temperature, salinity, chlorophyll and prey. These migrations if studied provide important information for stock identification and distribution in the ecosystem.

Tagging is one of the methods commonly used to study migration route of small pelagic fishes, which sometimes uncovers hidden migration routes. In the Gulf of Thailand, short mackerels (*Rastrelliger brachysoma*) were tagged and released by the DoF of Thailand from 1960 to 1965. From the study, about 16% of the tagged fishes were recaptured. The recovery rate is remarkably high for the small pelagic fishes, and gave useful information on the migration pattern and spawning ground of the species. The Department of Fisheries Malaysia has also carried out tagging activities for pelagic fishes in the Straits of Malacca and the South China Sea off peninsula Malaysia from 1990 to 1998 but resulted with lower recovery rate. However, until today information on migration patterns of the small pelagic fishes in the Southeast Asian region is still quite fragmentary and inadequate to be used for the purpose of managing the fishery.

Therefore, study on migration patterns of small pelagic fishes is an urgent need in the region. Although general trend of annual catch for the past 20 years shows increasing, details information on the status of the resources are still lacking. The conduct of the project is the second step towards achieving the main goal that is the formulation of recommendation for management of small pelagic fish resources in the Southeast Asian region. The first step was done during 2002 to 2006 by completing activities under the project titled 'Information collection for sustainable pelagic fisheries in the South China Sea,' which focuses on purse seine fishery. During this second step, stock identification and more importantly, confirmation on the extent of shared stocks through tagging and genetic study will be done. The information obtained at regional level from both of these steps combined with information already available at national level of all Member Countries will form a strong basis for the formulation of management plan for these shared stocks. This is important since effective management of shared stocks requires management measures to be taken for the whole coverage area, which is beyond national waters.

This program corresponds to #10 of Resolution at the ASEAN-SEAFDEC conference in 2011 (Strengthen knowledge/science-based development and management of fisheries through enhancing the national capacity in the collection and sharing of fisheries data and information) and #8 of Plan of Action (Accelerate the development of fisheries management plans based on an ecosystem approach, as a basis for fisheries conservation and management).

2. PROGRAM

2.1 Objectives

The objectives of this project are:

- 1) To examine the movement and migration routes of the targeted pelagic fishes (TPF) in the South China Sea (SCS) and Andaman Sea (AS);
- 2) To compare the growth patterns of the TPF in the SCS and AS;
- 3) To compare the results of growth patterns for the TPF between the tagging program and FiSAT analysis in the 1st phase of JTF II in the SCS;
- 4) To conduct genetic analyses for population study to confirm existence/absence of sub-populations in the region and for species identification; and
- 5) To suggest a management measures of purse seine fisheries in the SCS bases on the obtained information and outcomes from the 1st and the 2nd phases of JTF II project.

2.2 Program Description

MFRDMD is the responsible SEAFDEC Department for this project to manage and coordinate all project activities in collaboration with TD, Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Vietnam are involved in the tagging activities.

The project involves on-site training for tagging in each participating SEAFDEC Member Country, tagging implementation and genetic study in both the South China Sea and Andaman Sea. Tagging poster printed in national language was distributed throughout the countries involved to promote awareness on the project and to inform public on the reward given upon returning of recaptured tagged fish to the authority. Databases namely, “Data Management Software for small pelagic fish” and “Data on tagging” were developed and promoted as the main storage for all project data. The genetic study requires collection of tissue samples from most of the tagging sites, laboratory works and DNA sequencing analysis on these samples.

Results from the regional tagging and recapture data analysis together with preliminary finding from the genetic work were presented during the Terminal Regional Consultation Meeting in July 2012. Reports on these findings added with fishery assessment papers for scads and Indian mackerel that identify required actions for sustainable fishery will be the contents of the project final report. The report will be published and distributed to Member Countries by early 2013.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Remarks
Activity 1: Meetings/Workshops/Trainings Sub-Activity 1.4: <i>Terminal Regional Technical Consultation</i>	17-19 July 2012	Terminal Regional Technical Consultation/5 th Core Expert Meeting was held in Sepang, Malaysia. The main purposes of the consultation were to finalize and compile country reports and to prepare regional synthesis report. The meeting also discussed and decided on the remaining steps towards publication of terminal report. Complete report by country is to be produced by the country Technical Officer before the end of August 2012. Additional actions were requested during the meeting to make the country report more comprehensive. MFRDMD was also presented to the meeting fisheries assessments based on risk method for scads fishery in the South China Sea and Indian mackerel fishery in the Andaman Sea. The assessments identified list of activities that need to be carried out to ensure sustainable of both fisheries. The activities were prioritized by the meeting <i>via</i> group discussion.
Activity 2: Tagging Operation in the South China Sea and Andaman Sea Sub-Activity 2.4: <i>Purchase materials for genetic study</i>	Jan-Dec 2012	Materials such as chemicals and vials were purchased for genetic study.

Sub-Activity 2.5: <i>Tissue sample collection for genetic study</i>	Jan-Dec 2012	Thirty-five samples for each species (<i>Rastrelliger kanagurta</i> and <i>Decapterus maruadsi</i>) were sampled from 10 locations in South China Sea. Thirty-five samples for <i>R. kanagurta</i> were sampled from 4 locations in Andaman Sea. However, there are some misidentified/wrong species submitted by countries. These were: a) Vietnam (<i>Decapterus macrosoma</i> instead of <i>D. maruadsi</i>), b) Cambodia (<i>Rastrelliger brachysoma</i> instead of <i>R. kanagurta</i>), c) Thailand, Ranong site (<i>D. maruadsi</i> instead of <i>R. kanagurta</i>) - These samples will also be analyzed for future reference; d) Sample from Pekalongan, Indonesia were caught from Java Sea instead of South China Sea - These samples will be used as an out-group.
Sub-Activity 2.6: <i>Genetic survey for population structure and species identification</i>	Jan-Dec 2012	DNA was extracted from the collected tissue samples and analyzed both for population structure and species identification. This involves PCR and DNA purification works at MFRDMD's laboratory and DNA sequencing work at private laboratory.
Sub-Activity 2.7: <i>Genetic data analysis</i>	Jan-Dec 2012	Genetic data were analyzed using computer software for genetic data analysis. Preliminary results were presented at the 5 th Core Expert Meeting in July 2012.
Activity 3: Data Collection and Analysis Sub-Activity 3.2: <i>Data compilation and analysis</i> Sub-Activity 3.3: <i>Preparation and publishing of terminal report</i>	Jan-March 2012 July-Dec 2012	Preliminary analysis on the regional tagging and recovery data were done and results presented during the 5 th Core Expert Meeting in July 2012 in Sepang, Malaysia. The final eight country reports will be edited by SEAFDEC/MFRDMD before send for printing together with the regional reports on tagging and genetic study.
Activity 5: FADs and Sardine Information Sub-Activity 5.2: <i>Data verification and analysis</i> Sub-Activity 5.3: <i>Preparation and publishing of terminal report</i>	July-Dec 2012 July-Dec 2012	Supplementary information on present status of fish aggregation device (FAD) operation and Sardine catch in the participated Member Countries was compiled and analyzed based on the secondary data/information submitted by the countries. The information is complimentary to the biological data collection done during the first phase and the tagging and genetic findings carried out in the second phase of the Japanese Trust Fund II. It provides additional information for formulation of appropriate management measures of purse seine fishery. The summary report on sardine other information such as FAD and local knowledge on small pelagic has been prepared by SEAFDEC/ MFRDMD based on submitted country reports. This report will be integrated into the project terminal report.

3.2 Evaluation of the Program Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Fisheries management for small pelagic fishes in the South China Sea and Andaman Sea
(2) Issues in the region at the beginning of the study: Total catch of small pelagic fishes, include Indian mackerels and round scads, consists more than 11% of the total marine capture production in the Southeast Asian region. The mackerels and scads are the major group contributing up to 38% of the total small pelagic fishes in the region in 2010. Besides food resources, capture fisheries targeting these fishes are of fundamental importance to this region in terms of employment and livelihood of fishers. However, management of these resources is still neglected because information on



biology and stocks are lacking. For sustainable use of these resources, formulation of a management plan is required. Considering the likeliness of these stocks shared by countries bordering with the same ecosystems both in the Andaman Sea and the South China Sea, studies to ascertain migration route and existence/absence of sub-populations in the areas is needed. This is crucial since effective management of shared stocks requires management measures to be taken for the whole coverage area that is beyond national waters.

3.2.2 Expected final goals of the program:

- To confirm unit stock of the target species in the South China Sea and Andaman Sea.
- To contribute for the formulation of a management measures of the purse seine fisheries and pelagic fish resources in the region with reference to the biological information of targeted species; and
- To achieve fishery management of the targeted small pelagic fish resources in the region to sustain the fisheries for the continuous food supply, employment and fishers' livelihood, based on the biological data and information.

3.2.3 “Steps” toward achieving final goals:

- Step 1:** Information collection for sustainable pelagic fisheries in the South China Sea
- To clarify the actual area of operation and catches of the purse seine fishery;
 - To collect some resource indicators, such as landings, CPUE, catch composition in the purse seine fishery; and
 - To estimate biological information, *i.e.* growth parameters, mortalities and exploitation rate of small pelagic fishes that is crucial indicator for resources status in management of the fishery;
- Step 2:** Tagging program for economically important pelagic species in the South China Sea and Andaman Sea
- To know moving behavior and migration routes of small pelagic fishes;
 - To clarify existence/absence of sub-populations of these small pelagic fishes that is crucial for management purpose, through genetic study; and
 - To identify list of activities that need to be carried out to ensure sustainable exploitation of these resources;
- Step 3:** Formulation of recommendation for small pelagic fish management measures in the ASEAN region.
- To estimate status and trends of exploitation of these resources; and
 - To propose management measures for sustainable use of these resources and related fisheries;

3.2.4 Activities in the current program:

- (1) Current position of the program:** Step 2-3
- (2) Program duration:** 2008-2012
- (3) Main activities**
- Tag and recapture study of economically important small pelagic fishes to understand their migrating route and sub-population structures for their future management purpose in the South China Sea and Andaman Sea; and
 - Genetic study to confirm on existence/absence of sub-populations of the target species in the South China Sea and Andaman Sea.

3.2.5 Progress and achievements of the current program:

- (1) Main activities conducted in the current program**
- Prepare and to disseminate technique for tagging implementation for small pelagic fishes in each participating Member Countries (on-site training, formulation of SOP, purchasing of tagging materials, etc);
 - Implement tag and recapture study for targeted small pelagic fishes in eight Member Countries;
 - Analyze recovering data to understand the migrating routes and sub-population structures of the targeted small pelagic fishes; and
 - Conduct genetics study to confirm on the existence of sub-population of the targeted small pelagic fishes.

(2) Main achievements till the end of 2012 (tentative)	
<ul style="list-style-type: none"> • Four Core Expert Meetings and demonstration of tagging experiment; • Implementation of the on-site trainings for tagging implementation in eight Member Countries; • Formulation of Standard Operating Procedure (SOP) for tagging small pelagic fishes in the region; • Making and dissemination of posters in each native languages (8) to obtain well recovery of tagging fishes; • Promotion of the database software in Member Countries and improvement of it for tagging studies; • Implementation of tagging activities at selected study sites in each Member Countries where 32,345 fishes were tagged in the South China Sea and 15,770 in the Andaman Sea; • Some amount of tagged fish recovery, <i>i.e.</i> 356 recovered tagged fishes in the South China Sea and 161 in the Andaman Sea; • Mitochondrial genetic information of small pelagic fishes; and • Preparation for publication of terminal report. 	
(3) Outputs during the program period and expected achievement rate till the end of 2012 (tentative)	
Expected Outputs	Achievement rate (%)
<ul style="list-style-type: none"> • Preparation for tagging implementation in each Member Countries (on-site training, formulation of SOP, tagging material purchasing, etc) 	100%
<ul style="list-style-type: none"> • Preparation for tagged-fish recovering and data compilation system 	100%
<ul style="list-style-type: none"> • Implementation of tag and recapture study for targeted small pelagic fishes 	100%
<ul style="list-style-type: none"> • Understanding of the migrating route of the targeted small pelagic fishes 	100%
<ul style="list-style-type: none"> • Understanding of the subpopulation structure for management 	100%

3.2.6 Evaluation of Program activities in 2012 (2008 – 2012):

<p><u>Tagging Activities:</u> In the South China Sea area, 85% achievement on number of tagged than the target number was recorded where 32,345 were tagged. The highest number tagged species was <i>Decapterus maruadsi</i> at 14,579 or 45% from the total fish tagged in the area. <i>Rastrelliger kanagurta</i>, the second most tagged species (7,665 or 24%) and the remaining 31% of the tagged fishes were <i>R. brachysoma</i> (5,220 tails, 16.6 cm) and <i>D. macrosoma</i> (4,881 tails, 13.9 cm).</p> <p>In the Andaman Sea area, 115% achievement where 15,770 fishes were tagged that higher than the target 13,600 fishes. That the reason why mackerels made up to 80% of the tagged fishes where <i>Rastrelliger kanagurta</i> was the highest with 6,636 tails and <i>R. brachysoma</i>, 5,975 tails.</p> <p>In terms of recovery of released tagged fish, the South China Sea area recorded the overall recovery rate of 1.07% and the Andaman Sea at 1.02%.</p> <p><u>Genetic Study:</u> Analysis on the genetic sequence of all samples received from Member Countries are progressing and final results should be ready by the end of 2012.</p>

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

No activity proposed for 2013 as the project will be completed in 2012.



PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Program Title:	Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters
Lead Department:	MFRDMD (in collaboration with TD)
Lead Country:	Malaysia
Total Duration:	2010-2014

1. INTRODUCTION

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 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 program is aimed to conduct several research activities to collect information of 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.

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 on identification and biological data collection on sharks and rays in the region need to be strengthened. This program is also aimed to train technical officers in the participating Member Countries to be able to collect biological data on sharks and rays in the region and to provide basic biological data on sharks and rays in the region through research activities.

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 (Recognising 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). Elasmobranch 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 standardised definitions and classifications for statistical data to facilitate regional compilation, analysis and data exchange).

2. PROGRAM

2.1 Objectives

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 is 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;
- 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;
- 6) To conduct a workshop on taxonomy and identification of sharks and rays in Southeast Asian waters and facilitate their biological studies in participating Member Countries; and
- 7) To study biology of major elasmobranch (sharks and rays) species, which will provide basic knowledge to conserve and enhance shark and ray populations in the region.

2.2 Program Description

SEAFDEC/MFRDMD in collaboration with TD will be the responsible Departments for this project, and will manage and coordinate all project activities. Technical Officers from selected SEAFDEC Member Countries will be invited for training of the ecological survey of sea turtle foraging habitats. The project involves research on sea turtle foraging populations, regional meeting/workshops and information collection on the sea turtles interaction with fishing. Regional training programs will be conducted to build up capacity in ASEAN Member Countries for conservation of sea turtles in the region. The project also involves a 5-day workshop on taxonomy and identification of sharks and rays in the Southeast Asian waters, biological data collection at landing sites with an emphasis on reproduction, and Regional Technical Consultation to share data on research and management of sharks and rays in the region. High biodiversity in the region makes this project sophisticated and more than 100 species of elasmobranches have been recorded. Biology-oriented Technical Officers from selected SEAFDEC Member Countries will be invited for a workshop for shark identification since they will be experts on sharks and rays in participating Member Countries.

The expected outputs for 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 incidental capture of sea turtles. The expected outputs for the project also include the biological information of sharks and rays in the region, which can be used for development of the management of sharks and rays in the region.

Management plans for conservation of sea turtles will be formulated by the end of the project.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Project/Activity Title	Duration	Remarks
SEA TURTLES Activity 2. Research in Sea Turtle Foraging Populations Sub-Activity 2.2: <i>Genetic study</i>	Jan-Dec 2012	During the scientific survey for ecological parameters in a pilot foraging habitat (Mabul and Sipadan islands) in 2011, more than 80 green sea turtles inhabiting there were captured. Tissue samples collected from these sea turtles were preserved appropriately and analyzed for genetic study of sea turtle subpopulation structures in the region. The mitochondrial DNA markers were used for the genetic analysis. Mitochondrial sequences have been obtained from the remaining sea turtle samples captured in 2011.

<p>Sub-Activity 2.4: <i>Satellite Telemetry</i></p>	<p>Jan-Dec 2012</p>	<p>Because of the workshop on sharks and rays in April, we could not use the budget during this period. The study is not possible between September 2012 and February 2013 because it is nearly the end of the turtle-nesting season. Therefore, the budget was used (i) to make payment on outstanding satellite fees and will be used (ii) to print the report of Regional Workshop on Management of Sea Turtle Foraging Habitats, which was conducted in November 2011 and (iii) to prepare the document on SOP for conducting research in foraging habitats.</p>
<p>Activity 3. Interaction between Sea Turtles and Fishing Sub-Activity 3.2: (by TD) <i>Information dissemination</i></p>	<p>May-Dec 2012</p>	<p>Results from the experiment conducted in 2011 are being analyzed. It is expected that the major finding can be disseminated to the Member Countries and other relevant agencies before the end of 2012. The finding from the experiment can be used for further reduction of sea turtle by-catch.</p>
<p>Activity 4. Action Plan for Managing Foraging Habitats of Sea Turtles Sub-Activity 4.1: Formulation of Action Plan for managing foraging habitats of sea turtles</p>	<p>May-Dec 2012</p>	<p>Preparation of draft action plan for managing foraging habitats of sea turtles in the region began. The action plan includes management on fishing activities that threaten adult sea turtles and abatement of egg poaching.</p>
<p>SHARKS AND RAYS Activity 1. Meeting/Workshop Sub-Activity 1.3: <i>Workshop on Taxonomy and Identification of Sharks and Rays</i></p>	<p>April 2012</p>	<p>The Regional Workshop on Taxonomy and Identification of Sharks and Rays was held at SEAFDEC/MFRDMD in Kuala Terengganu, Malaysia. Sixteen participants (two from each of the eight member countries) from Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam and representatives from SEAFDEC Secretariat and the Department of Fisheries Sabah were attended. The workshop was led by Dr. Keiichi Sato from Okinawa Churaumi Aquarium as a resource person and assisted by officers from SEAFDEC/MFRDMD and DoF Malaysia. The Workshop included lectures on taxonomy and biology, lab-works as well as a field trip to observe sharks and rays landings at LKIM Fishing Port, Kuantan, Pahang. Publication of a new field guidebook entitled 'Field Guide to Sharks of the Southeast Asian Region.' It became the first guidebook which included 69 shark species with colorful pictures and identification description published by SEAFDEC as a major reference for identification.</p>
<p>Activity 5. Research on Biology of Sharks and Rays Sub-Activity 5.1: <i>Data collection at landing sites</i></p>	<p>Apr-Dec 2012</p>	<p>Shark and ray specimens were collected from Kuala Terengganu, Dungun, Kemaman (in Terengganu) and at LKIM Fishing Port in Kuantan, Pahang. Their biological data including length, sex, maturity size, number and size of embryos/eggs were recorded. This information will strengthen the available reproductive information on major sharks and rays species that had been already collected during 2003-2004. SOP for sampling tissues for DNA analysis were prepared. Preparation of 'Field Guide on Rays of the Southeast Asian Region' and 'Look a-like sharks and rays in the Southeast Asian Region' was continued.</p>

3.2 Evaluation of the Program Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme:

Research and management of sea turtles in foraging habitats in the Southeast Asian waters

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

Conservation of endangered marine animals in relation with fisheries is now matters of global concern. In the Southeast Asian region, six of seven species of sea turtle 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 behavior and genetic homogeneity, and on the status of incidental catch and habitat reduction related to their mortality.

About 72 thousand tons of sharks and rays were captured in 2004 in Southeast Asia. High demands for shark fin in Asia raise a concern about shark populations. In 1998, FAO proposed International Plan of Action for the Conservation and Management of Sharks (IPOA-SHARKS) corresponds to increase of shark catch. SEAFDEC conducted the basic study of sharks in the ASEAN region in 2003-2004. Species composition and landing were available for one year at major ports in Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam. However, fisheries data in sharks and rays are still lamped 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 and to prepare management plans when needed. Identification of elasmobranch species is fundamental of biological data collection. Expertise on identification and biological data collection on sharks and rays in the region need to be strengthened.

3.2.2 Expected final goals of the program:

- To contribute for the formulation of a management plan of sea turtles inhabited in the ASEAN region with reference to the biological and ecological information;
- To contribute for the formulation of management plans of fisheries that are suspected to have relationship with sea turtle habitats in space and time;
- To develop and distribute mitigation measures for fisheries suitable for the ASEAN region to reduce incidental capture of sea turtles;
- To train technical officers in the participating Member Countries to be able to collect biological data on sharks and rays in the region; and
- To provide basic biological data on sharks and rays in the region through research activities.

3.2.3 “Steps” toward achieving final goals:

Step 1: Conservation and management of sea turtles

- To study management of sea turtle hatchery;
- To conduct sea turtle tagging survey in major nesting beaches in the region;
- To collect and compile information of current status of sea turtle nesting and conservation effort in the Southeast Asia; and
- To study and distribute the turtle excluder devices (TEDs) for shrimp trawl fishery as a mitigation measure to reduce sea turtle by catch.

Step 2: Research for stock enhancement of sea turtles

- To conduct sea turtle tagging and satellite tracking study for nesting females in major nesting beaches to obtain ecological information of sea turtles such as migration route, foraging habitats, etc;
- To conduct genetic analysis of nesting sea turtles to reveal subpopulation structures of sea turtles in the region; and
- To study and distribute the usage of responsible fishing gear and practices, including C-hook instead of J-hook in several longline fisheries, gillnet fishing, etc. to reduce sea turtle by catch.

Step 3: Research and management of sea turtles in foraging habitats in the Southeast Asian Water.

- To conduct sea turtle genetic, tagging, and satellite tracking study in their foraging habitats;
- To compile ecological and biological information of sea turtles in the foraging habitats;
- To conduct information collection of ecological parameters in pilot foraging habitats in the region;



- To collect information of sea turtle poaching in the region;
- To recognized fisheries which supposed to be closely related to sea turtle habitats in space and time;
- To study and distribute effective mitigation measures to reduce sea turtle unintentional capture by artisanal fisheries in their foraging habitats;
- To formulate management plans for conservation of sea turtle populations in the region;
- To conduct a workshop on taxonomy and identification of sharks and rays;
- To collect biological data on sharks and rays at landing sites with an emphasis of their reproduction;
- To conduct genetic analysis of un-sequenced shark and ray species;
- To compile biological data on sharks and rays in the region for conservation and management; and
- To identify experts on sharks and rays in the region for future cooperation.

3.2.4 Activities in the current program:

(1) Current position of the program: Step 3
(2) Program duration: 2010-2014
<p>(3) Main activities</p> <ul style="list-style-type: none"> • Regional Meetings/Workshops to discuss on the implementation plans, progress, and outcomes of this program; • Workshop on taxonomy and identification of sharks and rays; • Field survey to collect ecological information of selected pilot foraging habitats of sea turtles; • Genetic study of foraging sea turtles to reveal sea turtle population structures in the region; • Conventional tagging and satellite tracking studies of sea turtles to reveal sea turtle migration patterns and their nesting/foraging habitats in the region; • Information collection of sea turtle poaching in the region; • Research on interaction between sea turtles and fishing, including gillnet and hook-and-lines; • Dissemination of the outcomes from research on interaction between sea turtles and fishing, including gillnet and hook-and-lines; • Formulation of management plans for conservation of sea turtle populations in the region; • Research on biology of sharks and rays; and • Compilation of available biological data and identification of human resources on sharks and rays in the region.

3.2.5 Progress and achievements of the current program:

<p>(1) Main activities conducted in the current program</p> <ul style="list-style-type: none"> • The Regional Planning Meeting and Regional Progress Workshop; • Field survey to collect ecological information of selected pilot foraging habitats of sea turtles; • Genetic study of foraging sea turtles to reveal sea turtle population structures in the region; • Conventional tagging and satellite tracking studies of sea turtles to reveal sea turtle migration patterns and their nesting/foraging habitats in the region; • Information collection of sea turtle poaching in the region; • Research on interaction between sea turtles and fishing, including gillnet and hook-and-lines; • Dissemination of the outcomes from research on interaction between sea turtles and fishing, including gillnet and hook-and-lines; and • Formulation of management plans for conservation of sea turtle populations in the region.
<p>(2) Main achievements till the end of 2012 (tentative)</p> <p>Sea Turtles</p> <ul style="list-style-type: none"> • The Regional Planning Workshop and Regional Progress Workshop; • Ecological information of selected pilot foraging habitats of sea turtles was collected at Lawas and Mabul and Sipadan islands; • Genetic data on foraging sea turtles; • Inconel tagging was continued at the focused nesting sites of sea turtles in participating Member Countries and tag recovery had been monitored; • Satellite telemetry studies were conducted for one juvenile green turtle in Malaysia; and • Research on interaction between sea turtles and fishing, including sound stimuli and hook-and-line, was continued.

Sharks and Rays	
<ul style="list-style-type: none"> • Workshop on taxonomy and identification of sharks and rays; • Publication of 'Field Guide to Sharks of the Southeast Asian Region; • Final draft of 'Field Guide to Rays of the Southeast Asian Region; and • Final draft of 'Look-alike sharks and rays species in the Southeast Asian Region. 	
(3) Outputs during the program period and expected achievement rate till the end of 2012 (tentative)	
Expected Outputs	Achievement rate (%)
• Meeting/Workshop	75%
• Field survey to collect ecological information of selected pilot foraging habitats of sea turtles	100%
• Genetic study of foraging sea turtles to reveal sea turtle population structures in the region	80%
• 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	40%
• Research on interaction between sea turtles and fishing	100%
• Dissemination of the outcomes from research on interaction between sea turtles and fishing, including gillnet and hook-and-lines	100%
• Formulation of management plans for conservation of sea turtle populations in the region	50%
• Research on Biology of Sharks and Rays	50%
• Compile available biological data and identify human resources on sharks and rays in the region	50%

3.2.6 Evaluation of program activities in 2012:

Because of a new emerging issue related to CITES, increased budget was allocated to the activities for sharks and rays than those for sea turtles. Therefore, we could not conduct research on satellite tracking this year. The other activities which scheduled in 2012 were implemented accordingly. During the scientific survey for ecological parameters in a pilot foraging habitat (Mabul and Sipadan islands) in 2011, more than 80 green sea turtles inhabiting there were captured. Tissue samples collected from these sea turtles were preserved appropriately and analyzed for genetic study of sea turtle subpopulation structures in the region. Genetic results will be analyzed in 2013. Results from the experiment on the reaction of sea turtles to sound stimuli conducted in 2011 are being analyzed. The finding from the experiment can be used for further reduction of sea turtle bycatch. The report of Regional Workshop on Management of Sea Turtle Foraging Habitats in November 2011 and SOP for conducting research in foraging habitats will be printed until early 2013. The Regional Workshop on Taxonomy and Identification of Sharks and Rays was successfully completed at SEAFDEC/MFRDMD in Kuala Terengganu, Malaysia with more than 20 participants from 9 Member Countries. During the workshop, a new field guidebook entitled 'Field Guide to Sharks of the Southeast Asian Region' was published. It became the first guidebook, which included 69 shark species with colorful pictures and identification description published by SEAFDEC as a major reference for identification. Shark and ray specimens were collected from the east coast of Peninsular Malaysia. Their biological data will strengthen the available reproductive information on major sharks and rays species that had been already collected during 2003-2004.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1. Meeting/Workshop Sub-Activity 1.4: <i>Core Expert Meeting on Sea Turtles</i>	Oct-Dec 2013	MFRDMD will invite selected experts on sea turtles and ecological conservation from participating SEAFDEC Member Countries and SEAFDEC/TD, and resource persons to participate in the Core Expert Meeting on Sea Turtles in the fourth quarter of 2013. The meeting participants will discuss action



		plan for managing foraging habitats of sea turtles in the region and information of sea turtle poaching (Activity 2.5). Action plan for managing foraging habitats of sea turtles in the region will be formulated during the meeting.
Activity 2. Research in Sea Turtle Foraging Populations Sub-Activity 2.2: <i>Genetic study</i> Sub-Activity 2.5: <i>Information collection of sea turtle poaching</i>	Jan-Dec 2013 Oct-Dec 2013	The mitochondrial DNA sequenced data from different foraging sites will be used for the genetic analysis. Genetic structure of green sea turtles will be tested by a computer program for population genetic analysis. Information of sea turtle poaching will be discussed at the Core Expert Meeting.
Activity 4. Action Plan for Managing Foraging Habitats of Sea Turtles Sub-Activity 4.1: <i>Formulation of Action Plan for managing foraging habitats of sea turtles (in addition, preparing a book entitled 'Sea Turtles Conservation Program in Southeast Asia' for publication)</i>	Jan-Dec 2013	Action plan for managing foraging habitats of sea turtles in the region will be formulated based on the scientific information. The action plan includes management on fishing activities that threaten adult sea turtles and abatement of egg poaching. Purpose of the action plan is to conserve and enhance sea turtle populations in the region. In addition, a book entitled 'Sea Turtles Conservation Program in Southeast Asia' will be prepared and published by 2014.

4.2 Expected Outputs in the Year 2013

- Information on population structures of sea turtles in ASEAN region will be collected by the genetic study; and
- Action plan for managing foraging habitats of sea turtles in the region will be formulated based on the scientific information.

PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Project Title:	Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region: Towards Better Utilization and Harmonized Information for Fisheries Management in Southeast Asia
Lead Department:	SEAFDEC Secretariat
Lead Country:	Thailand
Total Duration:	2007-2012 (completed)

1. INTRODUCTION

Fishery statistics, data and information— which generally include registration, records, reporting, census and surveys, and other data and information including indicators that are derived either from routine and non-routine systems – are widely accepted as basis and being crucial for determination/development of national fisheries policies, formulation of national management frameworks and actions, or even basis for understanding the status and condition of fisheries resources. Since 1978, SEAFDEC plays a prominent role in compilation of regional fishery statistics in the form of Fishery Statistics Bulletin for the South China Sea Area. In addition to fishery statistics, SEAFDEC through its technical departments have also been implementing projects on collection of various fisheries data and information, *i.e.* fisheries resources surveys in the Southeast Asian waters, information collection of highly migratory species, deep sea fishery resources exploration, tagging of sea turtles and research study on their habitats, tagging of economically-important pelagic species, development and usage of practical indicators for sustainable development and management of capture fisheries, supporting vessel registration and licensing, etc. However, the outputs from different initiatives are rather scattered and haven't been integrated/digested to come up with information that could be used as a basis to support development and management for sustainable fisheries of the region.

To facilitate improvement of fishery statistics and information in the region, SEAFDEC, throughout the past decade has implemented a series of activities. From 2002-2005, the project on “Capacity Building on the Improvement of Fishery Statistical Systems in the ASEAN Region” were implemented focusing on enhancing the national capacity of the CLMV countries in the collection of national fishery statistics; and development of the Handbook on Collecting Fishery Statistics for Inland and Coastal Fisheries. From 2007-2009, the project on “Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region” was proposed and implemented with the major achievement in developing a Regional Framework for Fishery Statistics of Southeast Asia with harmonized standard definitions, and classification of fishery statistics; streamlining reporting of fishery statistics from the Member Countries to FAO and SEAFDEC; and supporting Member Countries in the development of National Status and Trends (STF) of Fisheries and Aquaculture.

After the completion of the project in 2009, this project was extended (upon the request by the PCM at its 32nd Meeting) until 2012. Activities to be undertaken during the extension period focus mainly on supporting further coordination and communication with Member Countries, SEAFDEC departments and relevant organizations, particularly to enhance linkage between SEAFDEC projects relevant to information/data collection and maximize the use of data collected through SEAFDEC projects; further enhance the compatibility of fishery statistics within the region and with the global level based on the harmonized definitions, standards, and classification of fishery statistics; and maximize the utilization of fishery statistics data and information for the preparation of the publication entitled “The Southeast Asian States of Fisheries and Aquaculture” or “SEASOFIA”, which is expected to serve as a basis for policy, planning and management for sustainable fisheries in the region.



Linkages to 2011 Resolution and Plan of Action

Resolution 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

Plan of Action 3. Strengthen national statistical mechanisms for fisheries and aquaculture and the exchange of statistical data and related information. Include other non-routine data and information such as fish consumption surveys as well as mobilizing local and indigenous knowledge with the aim of improving the valuation of fisheries and monitoring their performance, to address the needs of the ecosystem approach to fisheries and adaptation to climate change;

Plan of Action 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;

2. PROJECT

2.1 Objectives

The objectives of this project are:

- 1) To enhance linkage between SEAFDEC programs/projects relevant to information/data collection, and the use of data collected through SEAFDEC programs/projects to support policy planning and management of fisheries;
- 2) To enhance the compatibility of fishery statistics within the region and with the global level by harmonizing standards, definitions, and classification of fishery statistics with those adopted at the global level; and
- 3) To maximize the utilization of fishery statistics and information in order to obtain better understanding on status and trends of fisheries and aquaculture in order to serve as a basis for policy, planning and management of fisheries in the region.

2.2 Project Description

This project was formulated to continue providing support and assistance to the Member Countries to address requirements for better harmonization and utilization of fishery statistics, data and information to support development planning and management of fisheries. To harmonize data and information, the project would maintain the linkages and cooperation in the harmonization of norms/standards definitions and classifications of fishery statistics and information at regional and international levels. The project will also build on top from the past achievement, and further develop linkages/coordination and integration of existing data and information from various sources including from the projects undertaken by SEAFDEC in order to maximize its utilization for planning and management of fisheries at national and regional levels.

Activity 1: Improve better utilization and harmonize information from projects/initiatives implemented by SEAFDEC for fisheries management in Southeast Asia

The planning and implementation of collaborative SEAFDEC programs/projects and initiatives related to data and information on fisheries in the region were undertaken in rather isolation manner, resulted in inadequacy of focus in the improvement of data and information collection, analysis and presentation that could be used to serve planning and management for sustainable fisheries. This activity therefore aims to enhance linkage and coordination of data and information collected through various SEAFDEC programs/projects; and support the development of interface for databases generated by SEAFDEC programs/projects to enhance accessibility and usage of the data and information; as well as the mobilization of such data and information as input for better understanding on status and trends of fisheries of the region.

Activity 2: Harmonization of Standards/Norms, Classifications and Definitions of Fishery Statistics and Information in the Region

The activity aims to support harmonization of standards/norms, classifications and definitions of fishery statistics inline with those adopted at the international level in order to facilitate the compatibility of data for compilation at regional/global levels, as well as further analysis, presentation and interpretation. The activity also aims to reflect the regional uniqueness and specificity of fisheries in the region in the development of standards/norms, classification and definition for fishery statistics and information for fisheries management at the international level (e.g. CWP, FIRMS, APFIC) in order that the regional specificity be properly addressed and taken into account.

Activity 3: Development of the Status and Trends of Fisheries and Aquaculture in Southeast Asia

This activity aimed to maximize the use of available statistics, data and information from different available sources to enhance better understanding on the status and trends of fisheries and aquaculture in the region. At national level, three pilot countries, namely Philippines, Thailand and Indonesia, undertook the preparation of National Status and Trends of Fisheries and Aquaculture. The initiative is to be further applied at the regional level through the pilot case by SEAFDEC, making full use of fishery statistics, existing data and information generated from SEAFDEC programs/projects as well as from other available sources, in the preparation of the publication entitled “The Southeast Asian State of Fisheries and Aquaculture”.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Activity Title	Duration	Progress/Achievements
1. Improve better utilization and harmonize information from projects/initiatives implemented by SEAFDEC for fisheries management in Southeast Asia	Jan – Dec.	<ul style="list-style-type: none"> • Mobilization of information derived from programs/projects undertaken by SEAFDEC Secretariat and Departments that aim to collect fisheries data and information as inputs for the preparation of the publication on “The Southeast Asian States of Fisheries and Aquaculture (SEASOFIA) 2012
2. Harmonization of Standards/Norms, Classifications and Definitions of Fishery Statistics and Information in the Region	Jan – Dec.	<ul style="list-style-type: none"> • Coordination/communication with Member Countries and FAO on compilation of fishery statistics based on the harmonized framework of fishery statistics in Southeast Asia; • Participation to the CWP Second Inter-sessional Aquaculture Group Meeting (14 July 2012, Rome, Italy); and • Participation to the 24th Session of the Asia and Pacific Commission on Agricultural Statistics (8-12 October 2012, Vietnam)
3. Development of the Status and Trends of Fisheries and Aquaculture in Southeast Asia	Jan-Jun	<ul style="list-style-type: none"> • Production of the SEASOFIA 2012 with (using inputs from activity 1 and activity 2) for first dissemination during the 44th SEAFDEC Council Meeting • Dissemination of SEASOFIA 2012 to relevant agencies of the Member Countries, network libraries, international/regional organizations (including FAO/COFI and the Annual Session of APFIC)

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Towards Better Utilization and Harmonized Information for Fisheries Management in Southeast Asia
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(2) Issues in the region at the beginning of the study:
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The project started in 2007. Considering international and regional initiatives and concerns which also having impact to sustainable development of fisheries in Southeast Asia, this project then formulated to continue providing assistance to the Member Countries to address these issues to better utilization and harmonized information to support development planning and management of fisheries through facilitating cooperation in the region both at national and regional levels by mobilizing data and information from various sources. The project then developed new approach that build on top based on past achievement and experiences in supporting Member Countries and develop the linkage/coordination and integration of existing data and information, including SEAFDEC's projects for maximizing its utilization for planning and management of fisheries at national and regional level.

3.2.2 Expected final goals of the project:

Overall object of the project is to improve better understanding and knowledge of fisheries and aquaculture in the region by maximizing usage of data and information for fisheries management through:

- Improve utilization and harmonized information from projects implemented by SEAFDEC relevant to fisheries management in Southeast Asia;
- Norms/standards definitions and classifications of fishery statistics and information better harmonized, and issues/areas of regional uniqueness and specification harmonized at regional and international levels; and
- Develop the Status and Trends (STF) of Fisheries and Aquaculture in Southeast Asia (at the national and regional levels).

3.2.3 “Steps” toward achieving final goals:

Step 1: Review existing available and on-going development of data and information, and databases from SEAFDEC projects relevant to fisheries management

- To clarify and identify problem and constraints and recommend areas need to develop the linkage and coordination and find ways and means to utilization of data and information in harmonized/integrated ways for management purposes.
- To coordinate participate in the Consultations/Meeting of SEAFDEC Projects relevant to data and information for fisheries management for providing inputs and framework for developing the linkage and coordination for better utilization of data and information in harmonized/integrated ways for management purposes.

Step 2: Harmonize definitions, standards, and classification of fishery statistics, data and information to facilitate data sharing and exchange in the region, coordination with relevant Global and Regional initiatives/fora

- To coordinate and participate in the international development of standards/norms, classification and definition for fishery statistics and information, and fisheries information system at the international level *i.e.* Meeting of the Coordinating Working Party on Fishery Statistics (CWP) and Meeting of the Fisheries Resources Monitoring System (FIRMS) Steering Committee in order to reflect regional requirement, uniqueness and specificity of fisheries in the region, as well as to harmonize with on-going and development of regional and national development.

Step 3: Development of the Status and Trends of Fisheries and Aquaculture in Southeast Asia

- To support Pilot countries, namely Philippines, Thailand and Indonesia, in the development of National Status and Trends of Fisheries and Aquaculture, and share experiences with other countries
- To prepare the publication entitled “The Southeast Asian States of Fisheries and Aquaculture (SEASOFIA)” mobilizing inputs and outputs from Step 1 and Step 2.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 1, 2 and 3

(2) Project duration: 2007-2012

(3) Main activities:

- Improve better utilization and harmonized information from projects implemented by SEAFDEC for fisheries management in Southeast Asia;
- Harmonization of Standards/Norms, Classification and Definition of Fishery Statistics and Information in the Region; and
- Development of the Status and Trends of Fisheries and Aquaculture in Southeast Asia

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project	
<ul style="list-style-type: none"> • Enhancing the utilization of information from projects implemented by SEAFDEC for fisheries management; • Development of the new Framework for Fishery Statistics and Information of Southeast Asia; • Streamlining of the Reporting of Fisheries Statistics from the Member Countries to SEAFDEC and FAO; • Development of National Status and trends of Fisheries and Aquaculture (in 3 pilot countries, i.e. Philippines, Thailand and Indonesia); and • Development of the “Southeast Asian State of Fisheries and Aquaculture 2012 (SEASOFIA 2012) 	
(2) Main achievements till the end of 2012	
<ul style="list-style-type: none"> • Data and information derived from various programs/projects implemented by SEAFDEC were integrated and used to support policy planning and management of fisheries; • Framework for Fishery Statistics and Information of Southeast Asia developed and used as a basis for compilation of fishery statistics from Member Countries; • Questionnaire, submission process and focal points for reporting of fisheries statistics from the Member Countries to SEAFDEC and FAO streamlined; • Development of Status and Trends of Fisheries and Aquaculture at national levels (3 pilot countries: Philippines, Thailand and Indonesia), and sharing of experiences at regional level; and • Publication entitled “Southeast Asian State of Fisheries and Aquaculture 2012 (SEASOFIA 2012) produced and disseminated 	
(3) Outputs during the project period and expected achievement rate till the end of 2012	
Expected Outputs	Achievement rate (%)
• Capacity of SEAFDEC enhanced in the use of data and information from SEAFDEC programs/projects to generate information that could serve as a basis for policy planning and management of fisheries	75%
• Norms/standards definitions and classifications of fishery statistics and information harmonized within the region as well as with those of the international level	100%
• Reporting of statistics from Member Countries to SEAFDEC and FAO streamlined	80%
• Capacity of the Member Countries enhanced in development, integration and maximizing usage of data and information for development planning and management of fisheries	70%
• Information from SEAFDEC programs/projects as well as other available data and information in the region integrated and served as a basis for policy planning and management of fisheries.	80%

3.2.6 Evaluation of project activities in 2012:

<p>Activity 1: The project has enhanced linkages/coordination and integration of data/information generated from existing activities of SEAFDEC, as well as the use of such data/information to support policy planning and management of fisheries, particularly through the publication SEASOFIA 2012.</p> <p>Activity 2: The project has enhanced the harmonization of norms/ standards definitions and classification of fishery statistics and information at regional and international levels, and support Member Countries in the provision of their national fishery statistics for regional compilation based on the new statistics framework.</p> <p>Activity 3: The use of fishery statistics, data and information available in the region, including those from SEAFDEC was enhanced to serve as a basis for development planning and management of fisheries in the region through the SEASOFIA 2012.</p>

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

No activity proposed for 2013 as the project will be completed in 2012.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust V: Addressing International Fisheries-related Issues from a Regional Perspective
Project Title:	Assistance for Capacity Building in the Region to Address International Fisheries-related Issues
Lead Department:	SEAFDEC Secretariat
Lead Country:	Thailand
Total Duration:	Since 2010 (to be continued in 2013-2017)

1. INTRODUCTION

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.

In response to this, 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. 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 fisheries-related issues as well as environment related task, 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.

2. PROJECT

2.1 Objectives

- 1) Increasing the national capacity to address the international fisheries-related issues;
- 2) Developing the regional policy recommendation on international fisheries-related issues; and
- 3) Strengthening the ASEAN-SEAFDEC common position and/or coordinated positions on specific issues of the International Fisheries-related Issues.

2.2 Project Description

Dealing with the international fisheries-related issues that may impacts to the fisheries sectors in the region, therefore, it is crucial that SEAFDEC will continue keep monitoring the emerging international fisheries-related issues and provide platform to ASEAN-SEAFDEC country to meet and discuss as well as develop the Regional policy recommendation on the specific issues dealing with international fisheries-related issues. In addition, some important issues it is needed to develop the ASEAN-SEAFDEC common position or coordinated position for further adoption by the SEAFDEC Council Directors.

In this regard, the project is designed for continuing activities for the next phase from 2013 to 2017: three activities are designed as follows;

Activity 1: Monitoring & Enhancing the Capacity on International Fisheries-related Issues

In order to monitor and enhance the capacity on the current movement of the international fisheries-related issues, participation to the event concerns and in-depth study on specific subjects are needed. Updated information and current situation on the issues from the international events will be shared to all SEAFDEC Member Countries for their consideration and information.

Activity 2: Strengthening the Regional Policy Recommendations, Common/Coordinated Position

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 fisheries-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.

The issues to be discussed will be based on current situation form international fora and sometimes based on in-depth studies.

Activity 3: Information and Dissemination of the Results

The outputs from the project such as regional policy recommendations, ASEAN-SEAFDEC Coordination Positions and ASEAN Common Position will be disseminated and promoted.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

3.1 Activities Achievements in the Year 2012

Explain briefly the major achievements of the projects and activities conducted in the year 2012. This section is not applicable for newly proposed projects.

Activity Title	Duration	Remarks (Output)
1) Participated to the 26 th Meeting of the Animal Committee of the CITES held on 15-20 March in Geneva.	March 12	The outputs/report from the meeting were contributed/ progressed to the 44 th Meeting of the SEAFDEC Council in April 2012, Myanmar.
2) Participated to the Thirtieth Session of the FAO Committee on Fisheries and the Forth Meeting of the Regional Secretariat Network (RSN) organized in Rome, Italy from 9-13 July 2012. The objectives were to address the Regional Concerns that have been identified by SEAFDEC Member Countries such as fisheries management of the Commercially Exploited Aquatic Species (including CITES Issues), By-catch issues, IUU Fishing, and promote the SEASOFIA. In addition,	July 12	The results/report from the RSN-4 is also enclosed.
3) Participated to the 8 th Session of the Scientific Committee Meeting organized by WCPFC from 7-15 August 2012 in Busan, Korea. The meeting aims to discuss and assessment on the status of tunas stocks in the WCP Area in which SEAFDEC Member Countries such as Indonesia, Philippines, Malaysia, Thailand, and Vietnam are involved. The outputs of the meeting will be used/lead to development of the fisheries management	August 12	The Summary Report of the SC8 meeting. SEAFDEC informed our concerns on the improving of tuna stock assessment in the specific sub-regional areas such as Sulu-Sulawesi, South



measures in the WCP area/countries		China Sea and others.
<p>4) SEAFDEC will organize a Regional Technical Consultation (RTC) on International Fisheries-related Issues (2012) in end of October 2012, in Bangkok Thailand, to review up-coming critical trade related issues especially Commercially Exploited Aquatic Species that are proposed to be listed in the CITES Appendices. In addition the Regional Record of fishing vessels size from 24 m and over. The meeting will invite all ASEAN-SEAFDEC Member Countries, resource persons, SEAFDEC relevant Departments and ASEAN secretariat.</p>	<p>October 12</p>	<p>The ‘Executive Summary on International Fisheries-related Issues 2012-2013’ and regional policy guidance will be published. This paper will include the Views and Positions of ASEAN-SEAFDEC on CEASs to be addressed at the next CITES-CoP16</p> <p>The outputs of the RTC particularly the Views and Positions of ASEAN-SEAFDEC on CEASs will be introduced to the AEG-CITES for their support, meantime it will be submitted to both the Council Director and ASWGFi for their endorsement for the coordinated and common positions, respectively.</p>

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

<p>(1) Theme: Enhancing the Capability of Fishery Sectors to Address International-related Issues</p>
<p>(2) Issues in the region at the beginning of the study: 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 and small-scale fisheries sub-sector. In accordance to this, it is important to reconcile the international driven issues with the promotion on sustainable fisheries development. Therefore the Capacity Building to address international fisheries-related issues in the region is need to be supported as well as promotion of responsible fishing and practices.</p>

3.2.2 Expected final goals of the project:

<ul style="list-style-type: none"> • Better understanding of the international fisheries and environmental task related issues by the SEAFDEC Member Countries to meet the requirement of the international measures and secure the sustainable development of fisheries in the region; and • Awareness building and Increasing the responsible fishing technologies and practices in the region.

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Identify the issues addressed by International fora on fish trade and environmental task</p> <ul style="list-style-type: none"> • To clarify the urgent issues addressed by the International organizations on fish-trade and environmental task related issues; and • Information Collection via internet or/and participation to the international fora/ meetings <p>Step 2: In depth studies</p> <ul style="list-style-type: none"> • Conduct the in depth studies on the specific measures/impacts which could be made directly to the southeast Asian Region or/and Japan as SEAFDEC Member Countries; and • Consultation with external experts on the specific issues for preparing the input and provide information to all Member Countries <p>Step 3: Regional Technical Consultation on the international fisheries-related issues including fish-trade and environmental task issues.</p>
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<ul style="list-style-type: none"> • At least once a year the Regional Technical Consultation on the International Fish-trade and environmental task related issues will be organized in order to seek policy recommendation on the specific issues and endorse to SEAFDEC Councils; and • Ad-hoc meeting or special high level meeting: will be organized based on the urgent requirements from Member Countries. SEAFDEC under this project will provide platform for all ASEAN-SEAFDEC high level to meet and discuss and agree on regional interests to address at the international forum. <p>Step 4: Raising the Policy Recommendation to ASEAN-Sectoral Working Group on Fisheries for their consideration and discussion for the Region common position to meet/due on the issues.</p> <p>Step 5: Publicize the progress/policy recommendation</p>
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3.2.4 Activities in the current project:

Activity 1: *Monitoring & Enhancing the Capacity on International Fisheries-related Issues*

(1) Current position of the project: Step 1-5
(2) Project duration: 2008-2012 > 2013-2017
(3) Main activities <ul style="list-style-type: none"> • Regional Technical Consultation on International Fisheries-related Issues; and • In-depth Study for further discussion such as, Port State Measures, Eco-labeling, Fisheries Subsidies, Catch Certification Scheme, EC-Regulation, etc.

Activity 2: *Development of Regional Recommendations, Common/Coordinated Positions*

(1) Current position of the project: Step 1-5
(2) Project duration: 2010-2012 > 2013-2017
(3) Main activities <ul style="list-style-type: none"> • Regional Analysis on the Sea Cucumber in the Southeast Asian; • In-depth Study on the NPOA-Shark; • Drafting the Regional recommendations from the Ad-hoc meeting on Shark Expert; • Drafting the ASEAN-SEAFDEC Coordinated Positions on the CEASs (reject all proposed proposal on CEASs) used to address at the CITES-CoP15 in Doha, Qatar; • Promoting the plan of action on reduction of the impact from fishing on coastal and marine ecosystem; and • Drafting Recommendation to establish the Regional Fishing Vessel Record for vessel size 24m and over.

Activity 3: *Information & Dissemination of the Results*

(1) Current position of the project: Step 2-5
(2) Project duration: 2010-2012 > 2013-2017
(3) Main activities <ul style="list-style-type: none"> • Developed the Executive Report on the Policy Recommendation on the International Fisheries-related Issues for 2009-2010, 2010-2011, 2011-2012; and • Promoting the ASEAN-SEAFDEC Coordinated Position on CEAS

3.2.5 Progress and achievements of the current project:

(1) Activities conducted in the current project <ul style="list-style-type: none"> • Publicize the papers: Executive Report of the policy Recommendation for International fisheries-related Issues
(2) Achievements at this moment <ul style="list-style-type: none"> • Publicize the papers: Executive Report of the policy Recommendation for International fisheries-related Issues for 2009, 2010, 2011; • Publicize the Papers: <ul style="list-style-type: none"> - Status and Trends of Elasmobranchs Fisheries in the Southeast Asian; - Tuna fisheries in the Southeast Asian Region; and - Status and Trends of Tuna in the RFMOs (IOTC and WCPFC) related to Southeast Asia 2011; • POA on Reduction of Impact from the Fishing Gears and Practices the Coastal and Marine Environment in

<p>the Region;</p> <ul style="list-style-type: none"> • 2010 ASEAN-SEAFDEC Coordinated Positions on CEAS; and • Views and Positions of ASEAN-SEAFDEC Member Countries on the proposals to be listing of selected CEAS to the CITES Appendices at the CITES-CoP16. 	
(3) Expected output during the project period and expected achievement rate (for 2012)	
Expected Outputs	Achievement rate (%)
<p>1) Capacity from the international forum are increased:</p> <ul style="list-style-type: none"> • Status and Trends of Tuna in the Region: WCPFC areas • Current outputs from the Animal Committee Meeting of the CITES • Current status of the other international fisheries-related issues: Global record, PSM, SSF, etc. 	100%
<p>2) Strengthened ASEAN-SEAFDEC Cooperation on the International Fisheries-related Issues.</p> <ul style="list-style-type: none"> • Regional policy recommendation adopted by the RTC 2012 • ASEAN-SEAFDEC Coordinated/Common Positions on CEAS adopted by SEAFDEC Councils and ASWGFi 	80%
<p>3) Promotion of the ASEAN-SEAFDEC Policy Recommendations and the ASEAN-SEAFDEC Coordinated/Common Positions on CEAS</p>	50%

3.2.6 Evaluation of project activities in 2012:

The capacity building to address the international fisheries-related issues particularly on listing of the Commercially Exploited Aquatic Species (CEAS) to the CITES appendices are certainly needed. A reason is that many CEAS recently are proposed to be listed at the CITES Appendices even though having regulated by several fisheries management organization/bodies, meantime the CITES management authority who are mainly from the Environment Agency and not directly responsible for CEAS. Furthermore, there are not many ASEAN Member Countries includes fisheries authority at the CITES CoPs. One of the challenges is enhancing the Inter-agency among the both environment agency who directly relevant to CITES and fisheries agency in order to safe guard the national interest and avoid large impact even directly or indirectly to fisheries sectors particular the small scale livelihoods.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

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

Activity 1: Monitoring & Enhancing the Capacity on International Fisheries-related Issues

There are many international fisheries-related issues such as iuu-fishing, traceability, subsidies, global records, EC-regulation, port state measures, eco-labeling, cites, and etc., that needed to be updated and shared information to Member Country or address in the RTC for policy recommendation. In this activity, there are two main sub-activities as follows:

- 1.1) In-depth Study on International Fisheries-related Issues; and
- 1.2) Participation to the International Events on International Fisheries-related Issues

Activity 2: Strengthening the Regional Recommendations, Common/Coordinated Position

The aims of this activity is to develop the regional policy recommendation and /or draft the ASEAN-SEAFDEC common/coordinated position through the conducting Regional Technical Consultation on International Fisheries-related issues. All ASEAN-SEAFDEC Member Country will be invited to discuss the interested issues that needed to be addressed at other International or regional forum. The out puts from this RTC will be submission to the SEAFDEC Council Directors and further endorse at the FCG/ASSP and ASWGFi consequently.

In addition, the project will also support/organize an ad-hoc meeting to provide a platform for high level/ council to meet and discuss the urgently issues needed to be coordinated. In conclusion, there are two main sub activities are as follows:

- 2.1) Conduct the RTC on International Fisheries-related Issues; and
- 2.2) Ad-hoc Meeting (if required)

Activity 3: Information & Dissemination of the Project Results

All outputs of the project implementation will be published and disseminated to enhance the visibility of SEAFDEC.

4.1 Planning of the Project Activities

Activities /Sub-Activities	2013											
	J	F	M	A	M	J	J	A	S	O	N	D
1) Monitoring & Enhancing the Capacity on International Fisheries-related Issues												
1.1) In depth Study	X	X	X									
1.2) Participation to the International Events	X	X	X	X	X	X	X	X	X	X	X	X
2) Strengthening the Regional Recommendations, Common/Coordinated Position												
2.1) Conduct the RTC on International Fisheries-related Issues										X	X	
2.2) Ad-hoc/Special High Level Meeting	X	X	X									
3) Information & Dissemination of the Project Results												
3.1) Production and Dissemination of the outputs/outcomes			X			X			X	X	X	X

4.2 Expected Outputs in the Year 2013

- The capacity of ASEAN-SEAFDEC Member Countries on the International Fisheries-related Issues are increased to be addressed at the International fora;
- The regional policy recommendation on international fish-trade related issues is adopted by Member Countries; and
- ASEAN-SEAFDEC common position and/or coordinated positions on specific issues of the International Fisheries-related Issues is adopted by ASEAN-SEAFDEC Member Countries.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust V: Addressing International Fisheries-related Issues from a Regional Perspective
Project Title:	Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing Related Countermeasures
Lead Department:	SEAFDEC Secretariat
Lead Country:	Indonesia
Total Duration:	2011-2017

1. INTRODUCTION

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 30th Meeting of the SEAFDEC Council and more clear after the new millennium in 2001 when ASEAN-SEAFDEC adopted the Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region” as well as the new decade Resolution and Plan of Action on Sustainable Fisheries for Food Security toward 2020 in 2011 as a policy guidelines for SEAFDEC and Member Countries. To support the implementation of the Resolution and Plan of 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 with the international/regional organization responsible for fisheries will be included in the project framework in order to share and exchange information and transferring messages/information to the 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.

2. PROJECT

2.1 Objectives

- 1) To strengthen effective network/framework among all ASEAN Member Countries for regional cooperation;
- 2) To strengthen capacities of the Regional Fisheries Policy Network to facilitate the analysis of national issues into regional analysis;
- 3) To facilitate the evaluation of the SEAFDEC-JTF projects to ensure the results meet the goals and in line with the Resolution and Plan of Action; and
- 4) To publicize the results of SEAFDEC-JTF projects into SEAFDEC publication(s) such as Fish for the People, SEASOFIA etc.

2.2 Project Description

Dealing with the international and regional fisheries related which might affect to national/regional concerns on sustainable development of fisheries and aquaculture, therefore it is needed to strengthen the SEAFDEC network not only among the Member Countries but to the Regional and international organizations. To strengthen the SEAFDEC network and enhance cooperation from Member Countries meanwhile ensuring the activities meet the Member Countries requirements, therefore the project is designed to implement three main activities as follows:

<p>2. Strengthening Regional Fisheries Policy Network (RFPN) Support the Regional Fisheries Policy Network (RFPNs) for Cambodia, Lao PDR and Vietnam. The main task of RFPN is coordinating for Promotion on Sustainable Fisheries and IUU Fishing Related Counter-measures in the Southeast Asia and other SEAFDEC programs. The main activities of RFPNs are as follows:</p> <ol style="list-style-type: none"> 1) Support the Regional Analysis on specific emerging issues such as IUU fishing, Lesson Learnt and Impact from EC-Regulation 1005/2008, etc.; 2) Support the Regional SEAFDEC program when implementing in the Member Country 3) Participation and involvement to the ASEAN-SEAFDEC meeting as observer and participant. 4) RFPN group working on the special regional issues such as Study on model/system for inland capture fisheries data collection, etc. 5) Study trip 6) Attend the Training Course organized by TD and SEC. 7) Attend special class for specific subject to enhance RFPNs ability such as: Writing for technical paper, proposal and statement, Logical Frame Approach (LFA) 	Jan - Dec	<ol style="list-style-type: none"> 2.1) Country profiles on the Combating IUU fishing in the Southeast Asian 2.2) Questionnaires on Impact from EC-Regulation 1005/2008 for Southeast Asian Region 2.3) Proposal for RFPN group study
<p>3. Monitoring and Evaluation of the Project Activities</p> <ol style="list-style-type: none"> 1) SEAFDEC monitors and compiles the Tri-annual of each SEAFDEC project in order to prepare over outputs, progress and achievement of project and address at the 35th PCM. 2) SEAFDEC organized the Meeting on Review of the Japanese Trust Fund Program for 2012 and Onward held by SEAFDEC/SEC from 22-23 February 2011, at Jasmine Hotel, Bangkok, Thailand. In order to ensure the project implementation under the support from JTF are benefit to Member Countries. 		<ol style="list-style-type: none"> 3.1) Tri-annual report of all SEAFDEC projects. 3.2) Project Evaluation from the external evaluators.
<p>4. Information & Dissemination of the Results of SEAFDEC-JTF Project</p>		<ol style="list-style-type: none"> 4.1) On-going

3.2 Evaluation of the Project Outputs Till the Year 2012

3.2.1 Theme and issues:

(1) Theme: Strengthening the Promotion of Sustainable Fisheries

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

Required cooperation among ASEAN-SEAFDEC Member Countries and ensuring all SEAFDEC thematic programs are implemented to meet the sustainable fisheries in the region and benefit to all Member Countries.

3.2.2 Expected final goals of the project:

- Long term effective SEAFDEC network among ASEAN-SEAFDEC Member Countries dealing on the sustainable fisheries (including Aquaculture);
- Highest benefit from the implementation of SEAFDEC-JTF Programs; and
- Created SEAFDEC visibility on sustainable fisheries development at regional and international levels

3.2.3 “Steps” toward achieving final goals:

1) Enhancing the International and Regional Coordination

- 1.1) Support/establish the Regional Fisheries Policy Network (RFPNs)
- 1.2) Facilitating intra-regional exchange of expertise

2) Monitoring and Evaluation of the SEAFDEC-JTF Programs

- 2.1) Monitoring SEAFDEC-JTF project/ activities
- 2.2) Conduct the evaluation meeting

3) Information & Dissemination of the Results of SEAFDEC-JTF Project

3.1) Productions and Dissemination of the Special Publication:

3.2.4 Activities in the current project:

(1) Current position of the project: One year cycle: for step 3 in 2012
(2) Program duration: 2011-12 and 2013-2017
(3) Main activities: <ul style="list-style-type: none"> • Evaluated the progress of SEAFDEC projects; • Monitoring the project activities implemented within 2012 through the tri-annual report mechanism; and • Facilitate the Regional Cooperation through the regional workshop

3.2.5 Progress and achievements of the current project:

(1) Main activities conducted in the current project Activities 1 – 3...and on going Organizing the Joint Regional Workshop on Impact Assessment of the IUU fishing and EC-Regulation 1005/2008 on the Small Scale Fisheries in the Southeast Asian Region	
(2) Main achievements till the end of 2012 (tentative) <ul style="list-style-type: none"> • The Outputs of all SEAFDEC projects • Recommendations and Plan of Action on combating IUU fishing and EU-Catch Certification. • RFPNs completed one year work/study in SEAFDEC secretariat 	
(3) Outputs during the project period and expected achievement rate till the end of 2012 (tentative)	
Expected Outputs	Achievement rate (%)
Activity 1) <ul style="list-style-type: none"> • Enhanced the Regional Cooperation through the regional workshop • Increased the awareness of the emerging issues and how to address and respond to 	50%
Activity 2) <ul style="list-style-type: none"> • Increased capacity of the Regional Fisheries Policy Network 	70%
Activity 3) <ul style="list-style-type: none"> • SEAFDEC projects outputs for 2012 are compiled for distribution to all Member Countries 	50%
Activity 4) <ul style="list-style-type: none"> • Increased the visibility of SEAFDEC through website, publicizing 	20%

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

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

Activity 1: Enhancing Regional Coordination and Collaboration Mechanism

1.1) Support/establish the Regional Fisheries Policy Network (3RFPNs)

In 2013, Secretariat continued to support establishing 4 ASEAN RFPNs namely Cambodia, Loa PDR and Myanmar to work and learns on Regional and international fisheries related issues. In addition it is noted that another 4 ASEAN RFPNs (e.g. Thailand, Indonesia, Malaysia, and Myanmar will be supported by SEAFDEC-Sida Project. The scope of activities for RFPN is only limited to national concerned, but their task force will also addressing on Regional/international issues to support the overall coordination between SEAFDEC and Member Countries. Specific regional outputs from country inputs will be promoted in the Region.

1.2) Facilitating intra-regional exchange of expertise and information

Due to lack of expert and resources persons on the international emerging issues related to fisheries and trade, the expertise from outside regions such as International organizations/institutions may also needed. This activity includes mobilizing an International/regional expert(s) on specific issues to enhance the capability of SEAFDEC and member country.

Activity 2: Monitoring and Evaluation of the SEAFDEC-JTF Programs

2.1) Monitoring SEAFDEC-JTF project/activities

In 2013, in closed communication with the technical Departments and responsible person for each SEAFDEC JTF project, the update/ progress/outputs of the project activities will be monitored and compiled as the package results for 2013, this progress-information package will be submitted to the PCM for information and reference.

2.2) Meeting on SEAFDEC-JTF Projects Evaluation

SEAFDEC will invite the external evaluators who know well on fisheries issues in the Southeast Asian to evaluate and comments on the progress including planning for the following year activities. SEAFDEC will organize the evaluation meeting in the first quarter of 2013.

Activity 3: Information & Dissemination of the results of SEAFDEC-JTF Project

3.1) Productions and Dissemination of the Special Publication

In the 4th quarter of the year, SEAFDEC will compile all the progress and results of the implementations. The outputs of the results will be disseminated to all Member Countries and Donors for their consideration. Based on the project implementations, the good project results are encouraged to publish in the SEAFDEC publications such as Fish for the People, SEAFDEC Newsletters, and SEASOFIA.

4.1 Planning of the Project Activities

Activities/Sub-Activities	2013											
	J	F	M	A	M	J	J	A	S	O	N	D
1) Enhancing Regional Coordination and Collaboration Mechanism												
1.1) Support/establish the Regional Fisheries Policy Network (RFPNs)	X	X	X	X	X	X	X	X	X	X	X	X
1.2) Facilitating intra-regional exchange of expertise		X	X	X				X	X	X		
2) Monitoring and Evaluation of the SEAFDEC-JTF Programs												
2.1) Monitoring SEAFDEC- JTF project/ activities	X	X	X	X	X	X	X	X	X	X		
2.2) Conduct the evaluation meeting	X	X										
3) Information & Dissemination of the Results of SEAFDEC-JTF Project												
3.1) Productions and Dissemination of the Special Publication: Fish For the People, SEASOFIA, etc.			X			X			X	X	X	X

4.2 Expected Outputs in the Year 2013

- Capacity of the RFPNs on regional and international issues are increased;
- Cooperation among ASEAN Member Countries through the RFPNs mechanism are increased;
- The outputs of all SEAFDEC projects are compiled;
- The results of SEAFDEC projects are disseminated to all Member Countries; and
- SEAFDEC Visibility are increased.

**PROGRAMS UNDER THE FISHERIES CONSULTATIVE GROUP
OF THE ASEAN-SEAFDEC STRATEGIC PARTNERSHIP (FCG/ASSP) MECHANISM FOR
THE YEAR 2012-2013**

Proposed New Programs starting from the Year 2013

Project Title	Lead Department
Offshore Fisheries Resources Exploration in Southeast Asia	TD
Optimizing Energy Use and Improving Safety in Fishing Activities	TD
Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in the Southeast Asian Region	TD/SEC
Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products	MFRDMD
Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD
Research and Management of Sharks and Rays in the Southeast Asian Waters	MFRDMD



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security
Project Title:	Offshore Fisheries Resources Exploration in the Southeast Asia (<i>New</i>)
Lead Department:	Training Department
Lead Country:	To be determined
Total Duration:	2013 onwards
Proposed Budget:	USD 64,000 (tentative)

1. INTRODUCTION

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”, this project will provide technical support to the Member Countries in exploring the under-utilized fisheries resources including offshore areas in their respective EEZ waters.

SEAFDEC in close collaboration with the Member Countries has supported exploration of fishery/living resources in the EEZ of the countries in SEA. The overall aims of this project are to encourage Member Countries to collect the information on the offshore fishery resources in terms of research and training facilities using M.V. SEAFDEC 2, and to build human resources capacity for offshore fishery resources exploration.

2. PROJECT

1.1 Objectives

- 1) To build human resources capacity on offshore fisheries resources exploration in Southeast Asia;
- 2) To provide technical supports¹ to the Member Countries on offshore fisheries resources exploration; and
- 3) To train fisheries officials of the Member Countries on the post-harvest fish handling techniques².

1.2 Project Description

Currently, attempts of some countries in the Southeast Asia have been made to expand the fishing more towards the offshore in their EEZ areas where fisheries resources are still under-utilized as for the alternative fisheries resources. Over the years, TD has initiated and supported the Member Countries on the exploration of fishery resources in their EEZ waters through various programs. However, the development of such under-utilized fishery resources should be carried out with the view of international concerns on the ecosystem approach to fisheries (EAF). In this connection, TD had initiated a series of activities aiming at building human resources capacity of the Member Countries on exploration of fishery resources with the basis of EAF. During the past few years, TD had organized a number of technical meetings, workshops and trainings related to fisheries resource exploration. The outputs from such activities could be referred to as the stepping-stones for developing the offshore fishery resources in the EEZ of the Member Countries.

Main activities under this project include training activities and technical supports from TD on offshore fisheries resources exploration in EEZ of the Member Countries through human resources capacity building programs, sea trial, and cruise survey using M.V. SEAFDEC 2. The project will also facilitate a joint collaboration research survey in the area where fisheries resources are sharing among the countries in Southeast Asia.

¹ Knowledge, guidelines, technical advice, survey equipment and facilities, etc.

² Based on the facilities on-board M.V. SEAFDEC 2

1.3 Schedule of Activities (2013-2017)

Project Activities	2013				2014				2015				2016				2017			
	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄
Activity 1: Organization of the regional training course on offshore fisheries resources exploration																				
1.1 Design of the training course based on the sequence of the follow-up actions recommended through previous events organized by SEAFDEC and other relevant agencies.	X				X				X				X				X			
1.2 Training course for researchers of the Member Countries																				
1.2.1 Training course or regional workshop on offshore fisheries resources survey			X				X				X				X				X	
1.2.2 Training course on improvement of post-harvest fish handling at sea (onboard M.V. SEAFDEC2, back-to-back with the cruise survey of M.V. SEAFDEC 2 at the member country)			X				X				X			X					X	
Activity 2: Modification of the offshore sampling gears and their handbook																				
2.1 Review of the current handbook publications of SEAFDEC/TD related to offshore fisheries resources exploration		X																		
2.2 Modification or revision of the handbook for offshore sampling gears			X																	
2.3 Publication and dissemination of the new/revised handbook of offshore sampling gears				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Activity 3: Technical supports of TD to the cruise survey																				
3.1 Support the organization of the meeting for developing the survey plan and to monitor the progress of the survey	X				X					X				X					X	
3.2 Technical staff of TD to join the cruise survey					X				X				X				X			
3.3 Establishment of mechanism for sharing data of the results from the survey						X														
3.4 Publications of the meeting and survey report							X				X				X					X

3. ENVISAGED OUTPUTS OF THE PROJECT (2013)

- Developed human resources of the Member Countries on offshore fisheries resources exploration and fish handling at sea;
- Summarized the outputs of fisheries resource surveys carried out by M.V. SEAFDEC2 during 2005 to 2012;
- Supported technical to the Member Countries on offshore fisheries exploration;
- Drafted handbook of sampling gears for offshore fisheries resources exploration in Southeast Asia; and
- Drafted plan for the cruise survey for fisheries resources in sub-regional areas in Southeast Asia, *e.g.* Sulu Sulawesi Sea.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

Activity 1 Organization of the regional training course on offshore fisheries resources exploration

Two (2) training courses will be organized under this activity, including (i) training course on offshore fisheries resources survey, and (ii) the training course on improvement of post-harvest fish handling at sea. Designing of the contents of the training courses will be based on the recommendations made through the series of activities of SEAFDEC on fisheries resources exploration conducted during 2008 to 2012. For the first year of the training course, the major findings of the collaborative survey conducted by M.V. SEAFDEC 2 since 2008 will be summarized at the regional level. The regional training course on post-harvest fish handling will be organized on-board M.V. SEAFDEC 2 back-to-back with the cruise survey of M.V. SEAFDEC 2 in the EEZ of the Member Countries.

Activity 2 Modification/revision of the offshore sampling gears and their handbook

Modification or revision of the handbook of sampling gears will be made by the project staff in cooperation with the Member Countries and other relevant agencies, and also based on the recommendations made at the regional workshop mentioned in Activity 1. Activity under this category will also include publication and dissemination of new/revised handbook of the sampling gears to Member Countries and other relevant agencies.

Activity 3 Technical supports of TD to the cruise survey

In the first year of the project implementation, the meeting for drafting the cruise plan of the collaborative survey in sub-regional area (*e.g.* Sulu Sulawesi Sea) using M.V. SEAFDEC 2 will be organized under the cost-sharing basis of the participating countries. An agreement of the cost sharing among the participating countries to support the survey will also be discussed and developed prior to and during the meeting. Activity under this category also includes supporting of TD's technical staff to join this joint collaborative survey. Major outputs from the activity implementation will be disseminated and shared with the Member Countries and other relevant initiatives, and to be used as the regional and national references.

5. IMPLEMENTATION SCHEDULE FOR THE YEAR 2013

Activities	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
1. Organization of the regional training course on offshore fisheries resources exploration												
1.1 Design of the training course based on the sequence of the follow-up actions recommended through previous events organized by SEAFDEC and other relevant agencies			X	X								
1.2 Training course for officials of the Member Countries												
1.2.1 Training course or regional workshop on offshore fisheries resources survey							X					
1.2.2 Training course on improvement of post-							X					

harvest fish handling at sea (onboard M.V. SEAFDEC 2, back-to-back with the cruise survey of M.V. SEAFDEC 2 at the Member Countries)																			
Activity 2 Modification of the offshore sampling gears and their handbook																			
2.1 Review of the current handbook publications of SEAFDEC/TD related to offshore fisheries resources exploration					X	X	X												
2.2 Modification or revision of the handbook for offshore sampling gears									X	X	X								
2.3 Publication and dissemination of the new/revised handbook of offshore sampling gears.																X	X	X	
Activity 3 Technical supports of TD to the cruise survey																			
3.1 Support the organization of the meeting for developing the survey plan and to monitor the progress of the survey						X													
3.2 Technical staff of TD to join the cruise survey in Sulu Sulawesi Sea																			
3.3 Establishment of mechanism for sharing data of the result from the survey																			
3.4 Publications of the meeting and survey report																			

6. REVIEW SYSTEM OF PROJECT

6.1 Theme and Issues

(1) Theme: Support exploration of fisheries resources in the offshore areas.
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Significant depletion of inshore/coastal fisheries resources in the Member Countries; • Inadequate scientific information on the fisheries resources in the offshore areas in some Member Countries; and • Improvement of post-harvest fish handling for the offshore fisheries is still under developing.

6.2 Expected Final Goals of the Project

<ul style="list-style-type: none"> • Information on fishery resources in offshore areas in the SEA region; • Information on the possible impact of fishing activity to the offshore ecosystem; and • A set of recommendations for the medium- and long-term development and management plan of activities for utilization of fishery resources in the offshore areas of the Southeast Asian waters.
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6.3 “Steps” toward Achieving Final Goals

Step 1: Information collection on the offshore fisheries resources <ul style="list-style-type: none"> • Preliminary review information collected by the previous research works of SEAFDEC; and • Review of the current handbook published by SEAFDEC/TD that related to offshore fisheries resources exploration.
Step 2: Revision of the handbook and organization of the training course <ul style="list-style-type: none"> • Revision of the handbook for fish sampling gear of SEAFDEC for appropriate offshore sampling gears and methods; and • Organization of the regional training course on offshore fisheries resources exploration.
Step 3: Support the planning and implementation of the offshore fisheries resources survey. <ul style="list-style-type: none"> • Support the cruise survey and assist in monitoring the progress and analysis of the results of the cruise survey.
Step 3: Information dissemination <ul style="list-style-type: none"> • Establish mechanism for sharing data of the results from the survey; • Develop recommendations based on the scientific information for the offshore fisheries development and management plan; and • Disseminate, sharing, and exchange information collected from the project’s initiatives with the Member Countries and other relevant organization/initiatives.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust I: Developing and Promoting Responsible Fisheries for Poverty Alleviation and Food Security
Project Title:	Optimizing Energy Use and Improving Safety in Fishing Activities (<i>New</i>)
Lead Department:	Training Department
Lead Country:	To be determined
Total Duration:	2013 and onwards
Proposed Budget:	USD 45,000 (tentative)

1. INTRODUCTION

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

Resolution:

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

Plan of Action – Fisheries Management:

- # 20 Adjust existing programs to take into consideration the effects of climate change, focusing on the programs for (i) managing fisheries and habitats; (ii) reducing fishing capacity and combating Illegal, Unreported and Unregulated (IUU) fishing; (iii) strengthening local organizations; and (iv) **promoting safety at sea** and other priority areas. Develop indicators and reporting measures to assess how actions of the programs build resilience to climate change;
- # 30 Strengthen efforts to **address safety at sea**, including considerations of working conditions and socio-economic development, and ensure that these considerations are addressed by all concerned authorities while improving monitoring and control of the status of conditions, especially on small fishing boats.

Recently, SEAFDEC/TD organized the 3rd Regional Technical Workshop on Safety at Sea and Optimizing Energy Use for Small Fishing Boats at TD from 19 to 22 December 2011. The important outputs from the Workshop included:

- Updated information on various initiatives and efforts undertaken by the respective Member Countries in improving safety at sea for small fishing boats as a follow-up to the recommendations from the 22nd Workshop on Safety at Sea;
- Identification of minimum safety requirements and working standards for small fishing boats and fishers in the region;
- Format and reporting mechanism for documenting accidents at sea of small fishing boats, which have been agreed among the countries;
- Identification of activities to address key issues on energy optimization for small fishing boats for possible formulation and subsequent implementation;
- Agreement on the development of regional guidelines;
- Identification and compilation of relevant materials that could be used for the conduct of further training and awareness building activities; and

- Plans for the establishment of a network for "Safety at Sea and Optimizing the Use of Energy for Small Fishing Boats in Southeast Asia".

In this connection, it is planned that SEAFDEC will undertake further initiatives and efforts to promote improved safety conditions of the region's fishing vessels for fishers on-board, and optimized energy use of small-scale fishing vessels in the Member Countries.

2. PROJECT

1.1 Objectives

- 1) To transfer appropriate knowledge and standard on optimizing energy use in fishing and safety at sea for small-scale fishing vessels in the Southeast Asian countries; and
- 2) To promote awareness on optimizing energy use and safety standard for small-scale fishing vessels in Southeast Asian countries.

1.2 Project Description

In the Southeast Asian context, small-scale fisheries, which involve either full-time or part-time activities in inland and inshore waters, constitute the major part of the sector considering their contributions to local food security, sustainable livelihoods and poverty alleviation, and the fact that the small-scale fisheries subsector is generally weak in terms of financial and technical capabilities. Recently, small-scale fishing sector is the most diverse of the major food production sector and continues to be the most energy intensive food production method. The important concerned to fishing is high fuel price and the needs of appropriate knowledge on sustainable utilization/reduction of fuel consumption for the fishing vessels.

In the capturing process, the cost is almost entirely dependent on fuel for its operations and has no alternative source of energy in very soon future. This is especially in the case of small-scale fishing vessels, which are really fishing for major source of income and livelihood. At the same time, it has been recognized that their safety standard and living condition at sea are relatively poor due to the low household income mainly caused by deterioration of fisheries/natural resources and currently high investment cost in their fishing activities. In this connection, this project aims at: (i) transferring appropriate and applicable technology and knowledge to small-scale fishers on optimizing energy use in fishing activities and safety at sea on-board fishing vessels; (ii) providing a regional platform where discussion on how to cope with the problems on high investment of the small-scale fishing; and (iii) support national initiatives related to energy optimization and safety at sea.

In the Southeast Asian region, the major concerns on the use of energy include: over-power of the main engine, heavy-wooden constructed in hull structure, low maintenance of the engine and equipment, inappropriate fishing operations/practices. In more details, this project deals indirectly with fuel efficiency measures that require modification of existing equipment and optimize energy use on-board small-scale fishing vessels. It is therefore, the main activities under the project will transfer appropriate techniques and methods on how to optimize the use of energy on-board the fishing vessels. It includes improvement of current practices of the vessels, and introduction on suitable ways and method for the optimization of energy usage considering utilization of the vessels' engine and maximum fuel efficiency and tools that inherently require less fuel consumption for supported the fishing activities and fish transportation at low level of carbon emission.

1.3 Schedule of Activities (2013-2017):

Project Activities	2013				2014				2015				2016				2017			
	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄
Activity 1: Regional training workshop on safety at sea and optimizing energy use for small-scale fishing vessels																				

1.1	Regional training workshop on optimizing energy use and safety at sea	X																	
1.2	On-site training					X			X				X					X	
1.3	Establishment of a network for optimizing energy in Southeast Asia					X													
Activity 2: Review of the safety at sea of small-scale fishing vessels in the region				X	X	X	X	X											
Activity 3: Information dissemination					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

3. ENVISAGED OUTPUTS OF THE PROJECT (2013)

- A set of recommendations for optimizing energy use and safety at sea for small-scale fishing vessels;
- Established network for optimizing energy use and safety at sea for small-scale fishing vessels in Southeast Asia;
- Preliminary result of the review of the safety at sea of small-scale fishers in the region; and
- Publications, training materials/package, and promotional materials on optimizing energy and safety at sea for small-scale fishing vessels.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

Under this project, three (3) main activities will be implemented. The summary of the activity is as follow:

Activity 1 Regional training workshop on optimizing energy and safety at sea for small-scale fishing vessels

A series of activities to promote the optimization of energy use and safety at sea for small-scale fishing vessels will be carried out. The regional training workshop on optimizing energy use and safety at sea for small-scale fishing vessels will be initially organized. It is envisaged that a set of recommendations for improvement of energy optimization and safety standard of small-scale fishing vessels will be obtained. In addition, this training workshop will also provide a regional platform where the expertise and the national representatives on these issues can discuss on the necessity to establish a network on energy optimization and safety at sea for fishing vessels in the region. Through the course of the discussion at the training workshop, it was also envisaged that role, function, and responsibility of the network could be clarified. To effectively implementation of the project activities, on-site training at the selected site for following-up with the countries (based on the output from the training workshop) will be carried out. It is planned that various inputs and technical assistance will be mobilized from the existing expertise¹ on these issues. Finally, it is expected that that the participants of the training will be able to apply such knowledge and technologies to reducing the use of energy on-board small-scale fishing vessels.

Activity 2 Review of the safety at sea of small-scale fishing vessels in the region

With the view to obtain technical information for further improvement of the on-board safety for small-scale fishers in the region, a review of safety at sea of small-scale fishing vessels will be carried out in the Member Countries. It is planned that the outline of the review will be proposed for discussion at the regional training workshop as mentioned above. The result of the review will be further put into the process to be further follow-up with the appropriate actions at the regional and national levels. Methods for the review include: based-line survey, questionnaire survey, and others, to be recommended and discuss in detail at the regional training workshop of the project. It is envisaged that major causes of the

¹ FAO, BOB-IGO, FRA-Japan, etc.

accident at sea of small-scale fishing vessels of selected area (s) in the Member Countries will be summarized through the course of the review. Accordingly, the appropriate measures could be recommended to be further followed-up with the responsible agencies.

Activity 3 Information dissemination

Major outputs from the implementation of project activities and their progress will be disseminated to the Member Countries and other relevant agencies through project’s website, training and promotional materials, etc. The outputs from this activity could be used as the regional reference for optimizing energy and safety at sea for fishing vessels in the Member Countries.

5. IMPLEMENTATION SCHEDULE FOR THE YEAR 2013

Activities	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Activity 1: Regional training workshop on safety at sea and optimizing energy use for small-scale fishing vessels												
1.1 Regional training workshop on optimizing energy use and safety at sea		X										
1.2 On-site training												
1.3 Establishment of a network for optimizing energy in Southeast Asia												
Activity 2: Review of the safety at sea of small-scale fishing vessels in the region							X	X	X	X	X	X
Activity 3: Information dissemination										X	X	X

6. REVIEW SYSTEM OF PROJECT

6.1 Theme and Issues

(1) Theme: Optimizing energy use and improving safety at sea on-board fishing vessels
(2) Issues in the region at the beginning of the study
<ul style="list-style-type: none"> • Low level of safety standards for small-scale fishing vessels in Southeast Asian countries. • Low level of awareness of key stakeholders (fishers, fisheries administration, private sectors, etc.) on safety standards and optimizing energy use of the fishing vessels. • Major cost for fishing activities is coming from fuel consumption

6.2 Expected Final Goals of the Project

<ul style="list-style-type: none"> • Safety at sea for small-scale fishing vessels in the project participating areas is improved; • Energy use for small-scale fishing vessels in the project participating areas is improved; and • Training to enhance awareness for the key stakeholders on optimizing energy and safety at sea is organized

6.3 “Steps” toward Achieving Final Goals

<p>Step 1: Review of the safety at sea of small-scale fishing vessels in the region</p> <ul style="list-style-type: none"> • Design and planning of the review; • Conduct the review; and • Summarize the result of the review <p>Step 2: Organization of the regional training workshop on optimizing energy and safety at sea for small-scale fishing vessels</p> <ul style="list-style-type: none"> • Design of training workshop; • Organization of the regional training workshop; and • Follow-up activity with the country through national on-site training in the participating countries <p>Step 3: Information dissemination</p>
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PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Project Title:	Enhancing the Compilation and Utilization of Fishery Statistics and Information for Sustainable Development and Management of Fisheries in the Southeast Asian Region (<i>New</i>)
Lead Department:	Training Department and SEAFDEC Secretariat
Lead Country:	To be determined
Total Duration:	2013 onwards
Proposed Budget:	USD 117,000 (tentative)

1. INTRODUCTION

The primary goals of collecting fishery statistics are to obtain the information that could serve as a basis for policy planning and management for sustainable fisheries. 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. However, the regional compilation of fishery statistics is dependent on the availability and quality of statistics collected and provided by responsible agency of the respective countries.

During the past decade, the issues and the need to enhance conservation and sustainable utilization of commercially-exploited aquatic species and threaten species were raised in the international arena. Various aquatic species, *e.g.* sharks, was proposed for listing under the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). FAO also developed an International Plan of Action on Conservation and Management of Sharks (IPOA-Sharks) and urged countries to develop and implement their respective NPOAs accordingly. In the Southeast Asian region, the statistics on sharks was however insufficient to serve as a basis for sustainable management of the species. During the past years, there have been initiatives of SEAFDEC in improving better understanding on status of sharks through the conduct of regional technical meetings, and enhancing the capacity of Member Countries in the identification of shark species through training in order to support future data collection. Nevertheless, it is still necessary for SEAFDEC to continue undertaking initiatives to further develop more appropriate data collection methodologies in order to come up with better statistics and information on sharks in the future.

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, *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.

In addition to the above areas, as SEAFDEC has develop a new framework for fishery statistics, which was harmonized with international standard classification and definitions, and was endorsed by the SEAFDEC Council, activities would be further carried on to support Member Countries in reporting their respective national statistics in accordance with the agreed regional framework.

This project was therefore proposed, comprising 3 sub-projects, namely: 1) Improving the data collection of the commercially-exploited aquatic species and threaten species; 2) Facilitating Fisheries activities information gathering through introduction of Community base management; and 3) Harmonization of Fishery statistics in SEA region.

2. PROJECT

2.1 Objectives

Sub-project 1. Improving the data collection of the commercially-exploited aquatic species and threaten species

The objective of this sub-project is to build capacity of researchers/fisheries officers of the SEAFDEC Member Countries for improvement of fisheries statistical data collection and compilation for the commercially-exploited aquatic species.

Sub-project 2. Facilitating Fisheries activities information gathering through introduction of Community base management

The objective of this sub-project composes of the following items:

1. Improve compilation of fisheries information and socio-economic aspect 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 at national for setting up fisheries census in future;
3. Support Member Countries to promote the applicable practice of autonomous community based co-resource management with establishing support officer system towards institutional building of stakeholders for coastal and inland fisheries management; and
4. Facilitate better presentation and knowledge on status and condition of coastal small-scale and inland fisheries at national and regional level.

Sub-project 3. Harmonization of fishery statistics in the Southeast Asian region (Secretariat)

The objective of this sub-project is to improve the reporting of statistics by the ASEAN Member Countries in line with the harmonized framework for fishery statistics of Southeast Asia.

2.2 Project Description

Sub-project 1. Improving the data collection of the commercially-exploited aquatic species and threaten species

In 2013, the sub-project activities focus on improvement of data and information collection for commercially-exploited aquatic species of sharks. This is to follow-up the outputs from the series of events, including the technical meetings in Thailand in 2011 and 2012 organized by TD, and the regional training course on sharks species identification organized by MFRDMD in early 2012. The outputs from these showed that information on sharks stock status in Southeast Asian Countries has yet reliable. The dearth of information on stock structure, abundance, life history, and reproductive capacity of major marine and freshwater sharks species treat sharks as a separate statistical data. Moreover, insufficient policy and financial support on research and management of sharks is commonly the key issues in the region¹. This project aims at continuing the support the Member Countries to improve quality and timeliness of data/information on sharks.

Sub-project 2. Facilitating fisheries activities information gathering through introduction of community base management

In the Southeast Asian region, coastal and inland fisheries is the main fisheries production and more socially and economically. People rely on the coastal area, river, reservoir, lake and etc. system as the primary source of nutrition and as well their livelihood. Sustainable development of the fisheries resources need to enhance various national capacities to collect national information for proper management of the fisheries resources and to obtain qualitative data. From catch data information and

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

socio-demographic characteristics and trends of coastal fishing communities have identified needs, and this calls for a need to strengthen community fisheries organization and capacity building for better development and management of coastal resources to ensure sustainable livelihood of coastal communities. The project purpose is to promote fisheries information gathering through introduction community-based fisheries management for coastal and inland fisheries in the Southeast Asian Region.

Sub-project 3. Harmonization of fishery statistics in the Southeast Asian region

SEAFDEC has developed a Regional Framework for Fishery Statistics of Southeast Asia, which has been used as a skeleton for countries in reporting of their fishery statistics for compilation in the Fishery Statistical Bulletin of Southeast Asia by SEAFDEC (since 2008). This sub-project is therefore proposed to continue supporting the collection and reporting of statistics by the ASEAN Member Countries in line with the new fishery statistics framework.

2.3 Schedule of Activities (2013 – 2017)

Sub-project 1. Improving the data collection of the commercially-exploited aquatic species and threaten species

As the activity under this sub-project will be implemented on yearly basis, see the following schedule of activity of this sub-project in item 4.

Sub-project 2. Facilitating fisheries activities information gathering through introduction of community base management

Project Activities	2013				2014				2015				2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Activity 1: Regional workshop on the cost effective way of fisheries activities information gathering included socio-economic aspect for setting up fisheries census in future for Southeast Asia	X																		X	X
Activity 2: Strengthening training on site to introduce the appropriate participatory mechanism of autonomous community based co-resource management including the methodology on gathering fisheries activity information with establishing support officer system																				
2.1 The Philippines		X	X	X					X	X	X	X								
2.2 Thailand		X	X	X					X	X	X	X								
2.3 Cambodia					X	X	X	X					X	X	X	X				
2.4 Laos					X	X	X	X					X	X	X	X				
2.5 Myanmar					X	X	X	X					X	X	X	X				
2.6 Vietnam					X	X	X	X					X	X	X	X				
Activity 3: Monitoring and additional support for Member Countries activities of facilitating autonomous community based co-resource management and gathering fisheries activity information																				
3.1 The Philippines					X	X	X	X	X	X	X	X					X	X	X	X
3.2 Thailand					X	X	X	X	X	X	X	X					X	X	X	X
3.3 Cambodia					X	X	X	X	X	X	X	X					X	X	X	X
3.4 Laos		X	X	X					X	X	X	X	X	X	X	X	X	X	X	X
3.5 Myanmar		X	X	X					X	X	X	X	X	X	X	X	X	X	X	X
3.6 Vietnam		X	X	X					X	X	X	X	X	X	X	X	X	X	X	X

Noted: Brunei Darussalam, Indonesia and Malaysia will be conducted training on site by MFRDMD with Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management Project, sponsor by Islamic Development Bank (IDB)

Sub-project 3. Harmonization of fishery statistics in the Southeast Asian region

Project Activities	2013				2014				2015				2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Activity 3.1 Coordination of work and participation in the Consultations/ Meetings of relevant projects	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Activity 3.2 Preparation of materials to support the collection/reporting of statistics	X	X			X	X			X	X			X	X			X	X		
Activity 3.3 Production/dissemination of the materials			X	X			X	X			X	X			X	X			X	X

3. ENVISAGED OUTPUTS OF THE PROJECT (2013)

Sub-project 1. Improving the data collection of the commercially-exploited aquatic species and threaten species

- Improved human resources capacity of SEAFDEC Member Countries for statistics of sharks
- Published practical guidebook on random survey for shark/ray information collection.

Sub-project 2. Facilitating fisheries activities information gathering through introduction of community base management

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. SEAFDEC try to assist Member Countries by provide three activities in 2013, the first activity is the regional workshop on the cost effective way of fisheries activities information gathering including socio-economic aspect for setting up fisheries census in future for Southeast Asian region, will get the appropriate way of fisheries data collection in Southeast Asia and apply to be standard methodology of SEAFDEC’s Member Countries. The second activity is training on site at SEAFDEC’s Member Countries to introduce the appropriate participatory mechanism of autonomous community based co-resources management including the methodology on gathering fisheries activity information with establishing support officer system. The targets participants are fisheries officers, who are normally providing information to decision maker for policy formulation and transforming policy into management planning. The third activity is monitoring and additional support for Member Countries activities of facilitating autonomous community based co-resource management and gathering fisheries activity information. These activities will assist fisheries officers of SEAFDEC’s Member Countries to practice in collecting and analyzing information from fisheries community for policy formulation, also to design coastal and inland fishery management plans by selected the appropriate participatory mechanism of co-management approach, that suit the local condition.

Sub-project 3. Harmonization of fishery statistics in the Southeast Asian region

Improved reporting of fishery statistics from Member Countries in line with the new Statistics Framework.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

Sub-project 1. Improving the data collection of the commercially-exploited aquatic species and threaten species

Activity 1.1 Training

Sub-activity 1.1.1 Regional Training Workshop



Training workshop on preliminary assessment of the stock status of sharks using data at the landing site¹ will be organized in Thailand. To monitor the effectiveness of this training, the National Focal Point for implementation of the follow-up activity at the country level will be invited to the training workshop. At the training workshop, each National Focal Point will be requested to develop a draft plan of the national training course based on inputs and technical supports from resource persons of SEAFDEC/TD and MFRDMD.

Sub-activity 1.1.2 On-site training

To ensure that the training workshop contributes a value to the Member Countries for conservation and management of sharks, the on-site training² at the country level on preliminary assessment of the stock status of sharks using data at the landing site will be organized in two (2) selected Member Countries³. The outline of the on-site training course will be designed and developed based upon the current situation of the countries.

Activity 1.2 Information dissemination

Sub-activity 1.2.1 Publication and dissemination of the practical guidebook

The practical guidebook on preliminary assessment of the stock status of sharks using data collection at the landing site developed, as the outcomes from the Activity 1, will be disseminated to the Member Countries and other relevant agencies.

Sub-activity 1.2.2 Project website

Information of project and its progress of activity implementation will be available through the website of TD.

Sub-project 2. Facilitating fisheries activities information gathering through introduction of community base management

Activity 2.1 Regional workshop on the cost effective way of fisheries activities information gathering included socio-economic aspect for setting up fisheries census in future for Southeast Asian region.

Objective of this activity is seeking recommendation on cost effective way of fisheries activity information gathering included socio-economic aspect from fisheries officers of SEAFDEC's Member Countries to be setting up fisheries census in future.

Activity 2.2 Strengthening training on site to introduce the appropriate participatory mechanism of autonomous community based co-resource management including the methodology on gathering fisheries activity information with establishing support officer system.

Objective of this activity is to arrange training course to fisheries officers of SEAFDEC's Member Countries, to promote tool and methodology on socio-economic survey and appropriate participatory mechanism of co-management to foster the use in coastal small-scale and inland fisheries. The subjects for training are as follow:

- Methodology on Socio-economic survey and information required to improve fisheries management and livelihood;
- Important role of resources management for sustainable fisheries resources;
- Appropriate Monitoring, Control and Surveillance (MCS) need for resources management in conjunction with community based co-management;

¹ Including method of random survey

² based on the draft plan made by the national focal point in order to follow-up the training workshop implemented under Activity 1

³ Priority given to CLMV countries.

- Community based co-management: Importance of autonomous fisheries management by community;
- Fisheries Law;
- How to introduce and facilitate community based co-management to fisheries community;
- How to communicate between fisheries officers and fisheries community;
- How to implement pilot activity to fisheries community; and
- Trail presentation by fisheries officers.

Activity 2.3 Monitoring and additional support for Member Countries activities of facilitating autonomous community based co-resource management and gathering fisheries activity information.

A monitoring will be facilitating SEAFDEC’s Member Countries to practice the autonomous community based co-resource management, fisheries data collection and gathering fisheries information included socio-economic aspect through up fisheries census in future.

Sub-project 3. Harmonization of fishery statistics in the Southeast Asian region

Activity 3.1 Coordination of work and participation in the Consultations/Meetings of relevant projects

SEAFDEC will continue to coordinate the work and activities related to harmonization of fishery statistics and take part in related consultation/meetings during the year.

Activity 3.2 Preparation of materials to support the collection/reporting of statistics

A handbook on statistics classification of aquatic animals and plants of the Southeast Asian region would be produced, based on the species that have been reported by countries and collated by SEAFDEC since 2008. This list would be in line with the FAO ASFIS List with local names that could be referred to by individual countries.

Activity 3.3 Production/dissemination of the materials

The Handbook (produced under activity 3.2) would be disseminated to facilitate the reporting of statistics by the ASEAN Member Countries to SEAFDEC in the future.

5. IMPLEMENTATION SCHEDULE FOR THE YEAR 2013

Activities	Year 2013											
	J	F	M	A	M	J	J	A	S	O	N	D
Sub-project 1. Improving the data collection of the commercially-exploited aquatic species and threaten species												
1.1 Training												
1.1.1 Regional training workshop				X								
1.1.2 On-site training						X			X			
1.2 Information Dissemination												
1.2.1 Publication and dissemination of the practical guidebook						X						
1.2.2 Project website	X	X	X	X	X	X	X	X	X	X	X	X
Sub-project 2. Facilitating fisheries activities information gathering through introduction of community base management												
Activity 2.1 Regional workshop on the cost effective way of fisheries activities information gathering included socio-economic aspect for setting up fisheries census in future for Southeast Asian region.	X	X										
Activity 2.2 Strengthening training on site to introduce the appropriate participatory mechanism of autonomous community based co-resource management including the methodology on gathering fisheries activity information with establishing support officer system.												
2.2.1 the Philippines				X	X	X	X					
2.2.2 Thailand				X	X	X	X					
Activity 2.3 Monitoring and additional support for Member Countries												



activities of facilitating autonomous community based co-resource management and gathering fisheries activity information.														
2.3.1 Lao PDR									X	X	X	X	X	
2.3.2 Myanmar									X	X	X	X	X	
2.3.3 Vietnam														
3. Harmonization of Fishery statistics in SEA region	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.1 Coordination of work and participation in the Consultations/Meetings of relevant projects	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.2 Preparation of materials to support the collection/reporting of statistics	X	X	X	X	X	X								
3.3 Production/dissemination of the materials									X	X	X	X	X	X

6. REVIEW SYSTEM OF PROJECT

Sub-project 1. Improving the data collection of the commercially-exploited aquatic species and threaten species

6.1 Theme and Issues:

(1) Theme: Improving data collections for commercially-exploited aquatic threaten species: sharks.
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Need to address the possible impact of international trade/environment on fisheries development in the region; • Need to provide Member Countries a platform to discuss on technical issues related to commercially-exploited aquatic species – sharks; and • Need to stimulate the development of a regional coordinated position for conservation and management of sharks in the region.

6.2 Expected Final Goals of the Sub-project.

<ul style="list-style-type: none"> • Capacity of researchers in the Member Countries on assessment of stock status of sharks is enhanced. • Practical guidebook on preliminary assessment of the stock status of sharks using data collection at the landing sites is published.
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6.3 “Steps” toward Achieving Final Goals:

Step 1: Organization of the training workshop for building human resources of the Member Countries on assessment of stock status of sharks based on data collection at the landing site
Step 2: Preparation of the guidebook for assessment of the stock status of sharks <ul style="list-style-type: none"> • Consultation meeting among experts from the field of: stock assessment, taxonomists, fisheries management, etc. • Development of the content for the guidebook. • Dissemination of the first draft of the guidebook to all experts involved in this activity. • Final consultation meeting with experts.
Step 3: Project meeting to summarize the major achievements of the project implemented in 2013.

Sub-project 2. Facilitating Fisheries activities information gathering through introduction of Community base management

6.1 Theme and Issues:

(1) Theme: Fisheries activities information gathering through introduction of Community base management
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Inadequate fisheries information to support fishery management, particular for management of fishing socio economic aspect.

- Lack of effective fisheries information gathering included socio-economic aspect for setting up fisheries census
- Need to improve knowledge of fisheries officers and fisheries communities on implementing the autonomous community based co-resource management.

6.2 Expected Final Goals of the Sub-project.

- Appropriate effective way of fisheries activities information gathering including socio economic aspect for SEA was established;
- Enhancing national capacity to strengthen effective way of fisheries information gathering included socio-economic aspect for setting up fisheries census in future;
- Fisheries officers of SEAFDEC's Member Countries improved knowledge on fisheries activities information gathering included socio-economic aspect for setting up fisheries census in future;
- Fisheries officers of SEAFDEC's Member Countries improved knowledge on implementing the autonomous community based co-resource management in their countries; and
- Sufficient information on fisheries communities in SEA region, through better implement necessary actions towards enabling the communities and local organizations were increasing.

6.3 "Steps" toward Achieving Final Goals:

Step 1: Assist regional initiative on appropriate cost effective way of fisheries activities information gathering included socio-economic aspect for setting up fisheries census in future for Southeast Asian region

Step 2: Assist national initiative on appropriate participatory mechanism of autonomous community based co-resource management including the methodology on gathering fisheries activity information

Sub-project 3. Harmonization of fishery statistics in the Southeast Asian region

6.1 Theme and issues:

(1) Theme: Harmonization of Fishery statistics in SEA region

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

Harmonization of the regional framework for fishery statistics in Southeast Asia has already been completed. However, there's a need to continue the coordination and communication with the focal points and the agencies responsible for providing national fishery statistics in the Southeast Asian countries, with relevant materials prepared and disseminated to ensure that statistics are provide in accordance with the new framework.

6.2 Expected Final Goals of the Sub-project.

- Understanding and capacity of agencies responsible for fishery statistics in the Southeast Asian region are enhanced in providing statistics in accordance with the harmonized regional fishery statistics framework

6.3 "Steps" toward Achieving Final Goals:

Step 1: Harmonization of statistics framework in the Southeast Asian region

Step 2: Supporting activities to facilitate the provision of national statistics in accordance with the harmonized statistics framework, *e.g.* through enhancing closer communication, development/dissemination of reference materials, etc.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust II: Enhancing Capacity & Competitiveness to Facilitate International and Intra-regional Trade
Project Title:	Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products (<i>New</i>)
Lead Department:	Marine Fishery Resources Development and Management Department
Lead Country:	To be determined
Total Duration:	2013-2017
Proposed Budget:	USD 33,000 (tentative)

1. INTRODUCTION

IUU fishing was identified as the biggest threat to the sustainable development of fisheries and aquaculture in the Asia-Pacific region (29th Session of APFIC). To combat IUU, countries are asked to take actions among others to adopt on sub-regional cooperation in deterring 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 (EC) Regulation No. 1005/2008. Most countries in the Southeast Asian region which are directly affected by the EC Regulation have developed their respective regulations based on the FAO Legally-binding Instrument on Port State Measures (PSM). Therefore it is also important for the countries in the region to support the efforts to use trade measures to combat IUU fishing within the region. In line with EU initiatives, this project will seek possible way to combat IUU fishing in the large- and small-scale fisheries by seeking a new catch certification system for international trade in fish and fishery products within the Southeast Asian region.

2. PROJECT

2.1 Objectives

- 1) To provide suggestions for Member Countries to strengthen cooperation in combating IUU fishing;
- 2) To study existing fishing and trading practices in small-scale fishery in the region;
- 3) To analyze associated problems in compliance with the EC Regulation No. 1005/2008 in the region; and
- 4) To suggest a possible catch certification system for large- and small-scale fisheries to ensure only non-IUU/legal fish and fishery products traded in the region.

2.2 Project Description

MFRDMD is the responsible SEAFDEC Department for this project to manage and coordinate all project activities. All SEAFDEC Member Countries are involved in the activities.

The project involves identification of existing mechanisms in small-scale fishery and associated problems in compliance with the EC Regulation No.1005/2008 for large-scale fishery in the region through core expert meetings. The information gathered will be analyzed and comparison among countries will provide a possible catch certification system for combating IUU fishing in the Southeast Asian region with possible expansion and/or modification of the regulation for international trade in fish and fishery products within the region.

The outputs of the project will provide basis for developing a catch certification system to ensure only non-IUU/legal fish and fishery products traded in the region. The cooperation amongst the Member Countries will be strengthened so as to facilitate trade within the region and eventually combating IUU fishing in the large- and small-scale fisheries.

This project corresponds to #8 of the Resolution at the ASEAN-SEAFDEC Conference in 2011: Foster cooperation among ASEAN Member Countries and with international and regional organizations in combating IUU fishing. This project also corresponds to #67 of the Plan of Action at the conference: Strengthen cooperation among Member Countries to implement international standards with regards to trading on fish and fishery products within the ASEAN region.

2.3 Schedule of Activities (2013-2017):

Activities / Sub-Activities	2013				2014				2015				2016				2017			
	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄
1) Meetings for Effective Program Implementation																				
1.1 Core Expert Meetings		X	X							X	X	X	X							
1.2 Terminal Core Expert Meeting																			X	X
2) To study existing fishing and trading practices in small-scale fishery & Problems in compliance with the EC Regulation 1005/2008 in large-scale fishery																				
2.1 Identification of existing practices/mechanisms and associated problems	X	X	X	X	X	X														
2.2 Possible solutions to the problems							X	X	X	X	X	X								
3) Strengthened cooperation among Member Countries and suggest a possible catch certification system for large- and small-scale fisheries																				
3.1 Identify problems and strengthen cooperation among Member Countries in combating IUU fishing										X	X	X	X							
3.2 Suggest a possible catch certification system for large- and small-scale fisheries to ensure only non-IUU/legal fish and fishery products traded in the region.														X	X	X	X	X	X	X

3. ENVISAGED OUTPUTS OF THE PROGRAM

- Identification of fishing and trading practices in small-scale fishery in the region; and
- Analyzed associated problems in compliance with the EC Regulation No. 1005/2008 in the region.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

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

Activity 1: Meetings for Effective Program Implementation

Sub-Activity 1.1: Core Expert Meetings

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 in the second or third quarter of 2013. The meeting participants will identify existing practices in small-scale fishery and mechanisms and associated problems in compliance to EC Regulation 1005/2008 (Sub-activity 2.1).

Activity 2: To study existing fishing and trading practices in small-scale fishery & Problems in compliance with the EC Regulation 1005/2008 in large-scale fishery

Sub-Activity 2.1: Identification of existing practices/mechanisms and associated problems

Identification of 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 compiled by SEAFDEC/MFRDMD.

5. IMPLEMENTATION SCHEDULE FOR THE YEAR 2013

Activities / Sub-Activities	2013											
	J	F	M	A	M	J	J	A	S	O	N	D
1) Meetings for Effective Program Implementation												
1.1 Core Expert Meetings				X	X	X	X	X	X			
2) To study existing fishing and trading practices in small-scale fishery & problems in compliance with the EC Regulation 1005/2008 in large-scale fishery												
2.1 Identification of existing practices/ mechanisms and associated problems	X	X	X	X	X	X	X	X	X	X	X	X

6. REVIEW SYSTEM OF PROGRAM

6.1 Theme and Issues:

(1) Theme: Application of Catch Certification for International Trade in Fish and Fishery Products in Southeast Asian Region.
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • The impact of illegal, unreported and unregulated (IUU) fishing to fishery resources and stocks in the region; • Most countries in the Southeast Asian region have developed their respective regulations based on the FAO Legally-binding Instrument on Port State Measures (PSM) and EC Regulation 1005/2008. Therefore it is possible for the countries to support the efforts to use trade measures to combat IUU fishing within the region; and • Countries should ensure the primary responsibility of flag state and counter measures to combat IUU fishing

6.2 Expected Final Goals of the Project

<ul style="list-style-type: none"> • Suggestions to Member Countries a possible catch certification system for large- and small-scale fisheries to ensure only non-IUU/legal fish and fishery products traded in the region; and • Improved cooperation among Member Countries to combat IUU fishing
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6.3 “Steps” toward Achieving Final Goals:

Step 1: To study existing fishing and trading practices in small-scale fishery & Problems in compliance with the EC Regulation 1005/2008 in large-scale fishery

- Organization of the Core Expert Meeting; and
- Compilation of those problems by SEAFDEC/MFRDMD

Step 2: To develop a possible catch certification system for large- and small-scale fisheries

- Development of a possible catch certification system for large- and small-scale fisheries

Step 3: Development of improved cooperation among MCs in combating IUU fishing

- Identification of problems associate with cooperation among Member Countries; and
- Suggestions to Member Countries a possible catch certification system for large- and small-scale fisheries to ensure only non-IUU/legal fish and fishery products traded in the region



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust IV: Providing Policy and Advisory Services for Planning and Executing Management of Fisheries
Project Title:	Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region (<i>New</i>)
Lead Department:	Marine Fishery Resources Development and Management Department
Lead Country:	-
Total Duration:	2013-2017
Proposed Budget:	USD 70,100 (tentative)

1. INTRODUCTION

Indian mackerels and scads are very important small pelagic fishes in the Southeast Asian region. In 2010, more than 800,000 tons of *Rastrelliger* spp. and 700,000 tons of *Decapterus* spp. were captured in the region. Besides food resources, capture fisheries targeting these fishes are of fundamental importance to this region in terms of employment and livelihood of fishers. Purse seine is one of the major fishing gears to catch those small pelagic fishes. Basic biology of small pelagic fishes in the region has been studied by the Japanese Trust Fund II (JTF II) projects “Information Collection for Sustainable Pelagic Fisheries in the South China Sea” from 2002 to 2006 and “Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea” from 2007 to 2012. Those projects provided size distribution of the species and partial migration patterns. However, we are still lack of management plans of these pelagic fish resources. Therefore, we need to develop the best way to assess the size and state of the stocks for accurate TAC allocation and to find the most applicable TAC system for the purse seine fisheries in the region. Considering the likeliness of these stocks shared by countries bordering with the same ecosystems both in the Andaman Sea and the South China Sea, effective management of shared stocks requires management measures to be taken for the whole coverage area that is beyond national waters.

This program corresponds to #10 of Resolution at the ASEAN-SEAFDEC conference in 2011 (Strengthen knowledge/science-based development and management of fisheries through enhancing the national capacity in the collection and sharing of fisheries data and information) and #22 of Plan of Action (Establish and strengthen regional and sub-regional coordination on fisheries management and efforts to combat IUU fishing including the development of regional/sub-regional Monitoring, Control and Surveillance (MCS) networks).

2. PROJECT

2.1 Objectives

The objectives of this project are:

- 1) To compile and compare annual and/or monthly catch per unit effort (CPUE) data for the last three decades in Malaysia and Thailand where historical catch-effort statistics had been collected by SEAFDEC and to interpret the trend of resources in the region (additional CPUE data in the past will be analyzed by MFRDMD when they are voluntarily provided by Member Countries);
- 2) To assess which unit of effort is most appropriate for Malaysia, Thailand and other Member Countries and to examine other indicators for stock assessment;
- 3) To compare total allowable catch (TAC) systems in the world to examine which TAC system is applicable for management of small pelagic fishery in the region;
- 4) To estimate genetic structure of a targeted small pelagic species in the region; and
- 5) To propose management strategies for sustainable purse seine fisheries in the Southeast Asian region based on available data.

2.2 Project Description

MFRDMD is the responsible SEAFDEC Department for this project to manage and coordinate all project activities. Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Vietnam will be involved in Core Expert Meetings.

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 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 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 TAC systems in the world to examine which TAC system is applicable for management of small pelagic fishery in the region. Moreover, the genetic study intends to understand extend of admixture of a target species between South China Sea and Andaman Sea and/or within South China Sea for small pelagic fishery management. 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.

2.3 Schedule of Activities (2013-2017)

Activities/Sub-Activities	2013				2014				2015				2016				2017			
	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄
1) Comparative Studies for CPUE and TAC																				
1.1 Case studies for CPUE in the Southeast Asian region	X	X	X	X	X	X	X	X												
1.2 Suitable CPUE and other indicators for resource levels in Member Countries									X	X	X	X	X	X	X	X				
1.3 Comparison of TAC systems in the world	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
2) Genetic Data Collection and Analysis																				
2.1 Equipment preparation for genetic study	X	X	X	X																
2.2 Sample collection					X	X	X	X	X	X	X	X								
2.3 Genetic study							X	X	X	X	X	X	X	X	X	X				
2.4 Data compilation and analysis																	X	X	X	X
3) Meetings for Effective Program Implementation																				
3.1 Core Expert Meetings							X								X				X	
4) Recommendation for Purse Seine Fisheries Management in the Southeast Asian region																				
4.1 Recommendation for fisheries Management																	X	X	X	X
4.2 Preparation and publishing of terminal report																	X	X	X	X

3. ENVISAGED OUTPUTS OF THE PROGRAM

- Partial compilation and comparison of historical CPUE data for Thailand and Malaysia; and
- Preliminary comparison of selected TAC systems in the world

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

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

Activity 1: Comparative Studies for CPUE and TAC

Sub-Activity 1.1: Case studies for CPUE in the Southeast Asian region

SEAFDEC first published catch-effort statistics for 1978 in 1981 and those statistics between 1981 and 2000 for limited Member Countries had been published first by SEAFDEC Secretariat and later by MFRDMD. However, those data have never been analysed or compared by MFRDMD. In Sub-activity 1.1, MFRDMD will 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. A suitable unit of effort will be chosen from those statistics.

Sub-Activity 1.3: Comparison of TAC systems in the world

SEAFDEC/MFRDMD will compare different TAC systems in the world to examine which TAC system is applicable for management of fishery resources in the region. TAC comparisons will include systems in Japan, Norway and other countries. MFRDMD intends to clarify pros and cons of each system with/without individual catch quotas and to choose the best system in the region with its requirements for Member Countries if applicable.

Activity 2: Genetic Data Collection and Analysis

Sub-Activity 2.1: Equipment preparation for genetic study

To handle large number of specimens, one thermal cyclor and other genetic equipments will be purchased by SEAFDEC/MFRDMD.

5. IMPLEMENTATION SCHEDULE FOR THE YEAR 2013

Activities / Sub-Activities	2013											
	J	F	M	A	M	J	J	A	S	O	N	D
1) Comparative Studies for CPUE and TAC												
1.1 Case studies for CPUE in the Southeast Asian region	X	X	X	X	X	X	X	X	X	X	X	X
1.3 Comparison of TAC systems in the world	X	X	X	X	X	X	X	X	X	X	X	X
2) Genetic Data Collection and Analysis												
2.1 Equipment preparation for genetic study	X	X	X	X	X	X	X	X	X	X	X	X

6. REVIEW SYSTEM OF PROGRAM

6.1 Theme and Issues

(1) Theme: Resource management of small pelagic fishes in the South China Sea and Andaman Sea
(2) Issues in the region at the beginning of the study: Indian mackerels and scads are very important small pelagic fishes in the Southeast Asian region. In 2010, more than 800,000 tons of <i>Rastrelliger</i> spp. and 700,000 tons of <i>Decapterus</i> spp. were captured in the region. Besides food resources, capture fisheries targeting these fishes are of fundamental importance to this

region in terms of employment and livelihood of fishers. Purse seine is one of the major fishing gears to catch those small pelagic fishes. However, management of purse seine fisheries is still neglected because information of stocks is lacking. For sustainable use of these resources, formulation of a management plan is required. Therefore, we need to develop the best way to assess the size and state of the stocks for accurate TAC allocation and to find the most applicable TAC system for the purse seine fisheries in the region. Considering the likeliness of these stocks shared by countries bordering with the same ecosystems both in the Andaman Sea and the South China Sea, effective management of shared stocks requires management measures to be taken for the whole coverage area that is beyond national waters.

6.2 Expected Final Goals of the Project

- To contribute for the formulation of management strategies for small pelagic fish fisheries in the region; and
- To provide monitoring tools for pelagic fishery resources in the region.

6.3 “Steps” toward Achieving Final Goals

Step 1: Information compilation and analysis for sustainable pelagic fisheries in the South China Sea and Andaman Sea

- To compile and compare CPUE data for Malaysia and Thailand where historical CPUE data are available for last 30 years;
- To choose suitable unit of efforts for comparisons; and
- To estimate genetic structure of a small pelagic fish in the region.

Step 2: Comparison of existing systems for management of pelagic fishery resources

- To choose suitable CPUE and other indicators for resource levels in Member Countries; and
- To choose the best TAC system in the region with its requirements for Member Countries if applicable.

Step 3: Formulation of recommendation for management of small pelagic fish resources in the Southeast Asian region.

- To provide management strategies for sustainable small pelagic fisheries in the region.



PROJECT DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Thrust:	Thrust V: Addressing International Fisheries Related Issues from a Regional Perspective
Project Title:	Research and Management of Sharks and Rays in the Southeast Asian Waters (New)
Lead Department:	Marine Fishery Resources Development and Management Department
Lead Country:	To be determined
Total Duration:	2013-2014
Proposed Budget:	USD 24,590 (tentative)

1. INTRODUCTION

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 on identification and biological data collection on sharks and rays in the region need to be strengthened. This program is also 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 provide basic biological data on sharks and rays in the region through research activities.

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).

2. PROJECT

2.1 Objectives

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; and
- 2) To study biology of major elasmobranch species in Malaysia, which will provide basic knowledge for conservation and enhancement of shark and ray populations in the region.

2.2 Project Description

SEAFDEC/MFRDMD will be the responsible Department for this project, and will manage and coordinate all project activities. The project involves a 5-day workshop on taxonomy and identification of sharks and rays in Southeast Asian waters in 2012, biological data collection at landing sites in Malaysia with an emphasis on reproduction, and the Regional Core Expert Meeting to share data on research and management of sharks and rays in the region. High biodiversity in the region makes this project sophisticated and more than 170 species of elasmobranches have been recorded.

The expected outputs for the project include the biological information of sharks and rays in the region, which can be used for development of the management of sharks and rays in the region.

2.3 Schedule of Activities (2013-2017)

Activities / Sub-Activities	2013				2014			
	Q ₁	Q ₂	Q ₃	Q ₄	Q ₁	Q ₂	Q ₃	Q ₄
1) Meeting/Workshop								
1.2 Regional Core Expert Meeting							X	
2) Research on Biology of Sharks and Rays								
2.1 Data collection at landing sites	X	X	X	X				
2.2 Genetic study and information compilation	X	X	X	X	X	X		
2.3 Preparation and publishing of terminal report							X	X

3. ENVISAGED OUTPUTS OF THE PROGRAM

Through research on biology of sharks and rays, reproductive data and DNA sequencing information for species identification will be collected.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

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

Activity 2: Research on Biology of Sharks and Rays

Sub-Activity 2.1: Data collection at landing sites

Biological data collection at landing sites will be conducted in Pahang, Perak and Sabah. We plan to have field trips to those places. Our main interests will be at what age or size each species start reproducing and how much is its fecundity.

Sub-Activity 2.2: Genetic study and information compilation

MFRDMD will compile genetic information on sharks and rays as an alternative identification method. Currently bar-coding research on sharks is progressing in the world. It is expected that DNA data on some elasmobranch species in the region are available. MFRDMD will compile the available data and identify the species that have not been sequenced yet. Genetic research on some of the un-sequenced species will be conducted. Collaboration with other organizations may be considered.

5. IMPLEMENTATION SCHEDULE FOR THE YEAR 2013

Activities / Sub-Activities	2013											
	J	F	M	A	M	J	J	A	S	O	N	D
1) Research on Biology of Sharks and Rays												
2.1 Data collection at landing sites	X	X	X	X	X	X	X	X	X	X	X	X
2.2 Genetic study and information compilation	X	X	X	X	X	X	X	X	X	X	X	X

6. REVIEW SYSTEM OF PROGRAM

6.1 Theme and Issues

(1) Theme: Research and management of sharks and rays in the Southeast Asian waters
(2) Issues in the region at the beginning of the study: About 72 thousand tons of sharks and rays were captured in 2004 in Southeast Asia. High demands for shark fin in Asia raise a concern about shark populations. In 1998, FAO proposed International Plan of Action for the Conservation and Management of Sharks (IPOA-SHARKS) corresponds to increase of shark catch. SEAFDEC conducted the basic study of sharks in the ASEAN region in 2003-2004. Species composition and landing were available for one year at major ports in Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam. However, fisheries data in sharks and rays are still lamped 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 and to prepare management plans when needed. Identification of elasmobranch species is fundamental of biological data collection. Expertise on identification and biological data collection on sharks and rays in the region need to be strengthened.

6.2 Expected Final Goals of the Project

- To train technical officers in the participating Member Countries to be able to collect taxonomic and biological data on sharks and rays in the region; and
- To provide basic biological data on sharks and rays in the region through research activities.

6.3 “Steps” toward Achieving Final Goals

Step 1: Workshop on taxonomy and identification of sharks and rays

- To conduct a workshop on taxonomy and identification of sharks and rays.

Step 2: Research on Biology of Sharks and Rays

- To collect biological data on sharks and rays at landing sites with an emphasis of their reproduction; and
- To conduct genetic analysis of un-sequenced shark and ray species.

Step 3: Compile available biological data and identify human resources who work on sharks and rays in the region

- To compile biological data on sharks and rays in the region for conservation and management; and
- To identify experts on sharks and rays in the region for future regional cooperation.

**DEPARTMENTAL PROGRAMS
FOR THE YEAR 2012-2013**

I. Secretariat

Project Title	2012	2013
Center-wide Information Network	Y	N

II. Training Department

Project Title	2012	2013
Tailor-made Training Programs	Y	Y
Promotion and Enhancement Fisheries Information	Y	Y
Improvement of Fisheries Technology and Reduction of the Impact from Fishing	Y	Y

III. Aquaculture Department

Project Title	2012	2013
Adapting to Climate Change Impacts	Y	Y
Healthy and Wholesome Aquaculture	Y	Y
Maintaining Environmental Integrity through Responsible Aquaculture	Y	Y
Meeting Socio-economic Challenges in Aquaculture	Y	Y
Quality Seed for Sustainable Aquaculture	Y	Y

Y = Program proposed/implemented during the year

N = Program not proposed/implemented during the year



PROJECT DOCUMENT

Program Category: Departmental Program
 Project Title: Center-wide Information Network
 Responsible Department: SEAFDEC Secretariat
 Total Duration: Since 1998

1. INTRODUCTION

Considering the vital role of information as a tool in the development and management of fisheries, the program on Center-wide Information Network was initiated and adopted by the Council of SEAFDEC in 1998. Since then, based on SEAFDEC Information and Communication Policies, the Secretariat has developed several information and statistics programs and services to support management and development of sustainable fisheries in the region. Furthermore, during its 38th Meeting, the SEAFDEC Council endorsed the Information Strategies for Enhancing SEAFDEC Visibility and Communication, which is envisaged to streamline information activities in a more cost-effective manner, and enhance visibility of the organization. Since then, activities under the Program have therefore been formulated and implemented in-line with the adopted Information Strategy.

2. PROJECT

2.1 Objectives

The Program on Center-wide Information Network aims at:

- 1) Keeping the Member Countries, other organizations and public well informed of SEAFDEC activities;
- 2) Raising public awareness and visibility of SEAFDEC;
- 3) Providing various forms of fisheries information to support decision-making, management and development of fisheries sector; and
- 4) Enhancing communication/coordination and information sharing both within SEAFDEC and with others.

2.2 Project Description

In order to achieve the above objectives, the program will generate tools and materials to promote activities and visibility of the Center as a whole; widen the dissemination of useful fisheries information; enhance communication among the SEAFDEC staff and communication within SEAFDEC, with the Member Countries and other organizations; and provide HRD opportunities would also provided for the relevant SEAFDEC staff in order to improve the undertaken of relevant activities.

In addition, the program also provide platform for overall monitoring of the progress undertaken by all Departments in the implementation of the Information Strategies in order that the progress be appropriately report to the SEAFDEC Council at its annual meeting.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

Activities were undertaken by the Secretariat in collaboration with Departments in 2012 as follows:

Activity Title	Duration	Remarks
<p>1. Production and dissemination of Annual Report 2011 SEAFDEC Annual Report publishes highlighted activities and achievement of SEAFDEC during the annual working cycle. 1,000 copies of Annual Report 2011 were prepared and distributed to Member Countries, Network Libraries, fisheries-related institutions/organizations, collaboration organizations, and interested people.</p>	<p>Q1-Q3</p>	<p>100%</p>

<p>2. Information Compilation CD-ROM 2011 CD-ROM containing information/technical materials published by SEAFDEC secretariat and Departments in 2011 was prepared and provide to the SEAFDEC Council during the 44th annual meeting.</p>	Q1	100%
<p>3. Production and dissemination of reports of SEAFDEC annual meetings</p> <ul style="list-style-type: none"> • Report of the 34th SEAFDEC Program Committee Meeting • Report of the 14th FCG/ASSP Meeting • Report of the 44th SEAFDEC Council Meeting 	Q1-Q2 Q1-Q2 Q2-Q3	100% 100% 100%
<p>4. Production and dissemination of Newsletter Volume 34 Number 4 and Volume 35 Number 1-3 SEAFDEC Newsletter publishes activities of SEAFDEC in promoting fisheries development in Southeast Asia, with inputs from all SEAFDEC Departments and Member Countries (if any). Current production is 1,600 copies, distributed to Member Countries, Network Libraries, fisheries-related institutions/organizations, collaboration organizations, and interested people. Newsletter is also available through SEAFDEC Website. In addition, approximately 170 copies of Japanese version were also produced for distribution to agencies/institutions in Japan.</p>	Q1-Q4	75% (Vol.35 No.3 will be published by Q4)
<p>5. Production and dissemination of Special Publication “Fish for the People” Volume 10, Number 1-3 The Special Publication will be in easy reading style, targeting not only the technical people but also the non-technical including policy makers, young scientists and managers and others who are interested in the fisheries issues in ASEAN region. The number of copies produced is 1,500 copies/issue. The Special Publication is also available through SEAFDEC Integrated Website.</p>	Q1-Q3	80% (Vol.10 No.3 will be published by Q4)
<p>6. Fishery Statistical Bulletin for Southeast Asia</p> <ul style="list-style-type: none"> • Fishery Statistical Bulletin for 2010 • Fishery Statistical Bulletin for 2011 (<i>will be published in 2013</i>) 	Q1-Q2 Q3-Q4	100% 30%
<p>7. SEAFDEC calendar and new year card 2013 SEAFDEC calendar and new year card 2013 (2,500 copies) was produced/disseminated to promote the visibility of SEAFDEC, with the theme focusing on Ecosystem Approach to Fisheries: The Southeast Asian perspective.</p>	Q3-Q4	100%
<p>8. Other promotional activities</p> <ul style="list-style-type: none"> • SEAFDEC Information Catalogue (1,500 copies) 	Q2	100%
<p>9. ASEAN-SEAFDEC Conference-related publications</p> <ul style="list-style-type: none"> • ASEAN-SEAFDEC Conference Proceedings: Volume 2 (1,000 copies) • CD-ROM containing outputs from the Conference (1,000 copies) 	Q1 Q1	100% 100%
<p>10. Maintaining and improving of the website and secretariat e-mail system</p> <ul style="list-style-type: none"> • Maintaining e-mail system of SEAFDEC Secretariat • SEAFDEC Integrated Homepage (www.seafdec.org), with e-copy of recent SEAFDEC publications available for download • Portal Website for the ASEAN-SEAFDEC Strategic Partnership (http://www.asspfisheries.net) 	Q1-Q4	On-going
<p>11. Thirteenth SEAFDEC Information Staff Program Meeting The 13th ISP was organized from 23-24 October 2012 in Singapore, and hosted by MFRD. The ISP reviewed the achievements and monitored the progress of implementation of SEAFDEC information activities, and the Information Strategy; discussed and concluded activities to be incorporated under the Center-wide Information Network Program framework in 2013; and identified initiatives to be undertaken to enhance the SEAFDEC information activities and visibility in the future.</p>	Q4	100%



12. Enhancing communication and coordination through Regional Fisheries Policy Network (RFPN) In 2012, SEAFDEC Secretariat was stationed by Regional fisheries Policy Network (RFPN) comprises members from Indonesia, Malaysia, Myanmar, Philippines, and Thailand (with support from Sida) and Cambodia, Lao PDR and Vietnam (with support from Japanese Trust Fund). The main roles of the RFPN are to promote the formulation of regional fisheries policies and recommendations on the important regional fisheries-related issues. The RFPN also assist in coordination with Member Countries, and to promote closer collaboration between SEAFDEC and Member Countries.	Q1-Q4	On-going
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4. PROPOSED ACTIVITIES FOR THE YEAR 2013

As most of the activities under the program on Center-wide Information Network are routine activities (supported mainly by the Minimum Regular Contribution), in 2013 and onwards, the activities would no longer be proposed as program activities, but maintained as regular activities of the SEAFDEC Secretariat.

SEAFDEC DEPARTMENTAL PROGRAMS FOR THE YEAR 2012-2013: TRAINING DEPARTMENT

OVERALL REVIEW

In 2012, TD conducted three projects under Departmental program. The project on Promotion and Enhancement Fisheries Information was implemented to strengthen and encourage TD and SEAFDEC visibility to public. Three activities were conducted under this project as follows: 1) promotion and enhancement of fisheries knowledge, 2) production of Advance Fisheries Technology magazine, and 3) establishment of fishery information network. Continuing to implement its objectives, this project will be conducted under the activities of 1) promotion and enhancement of fisheries knowledge, 2) production of fisheries information materials, 3) human capacity building for SEAFDEC information staffs, and 4) strengthen of fishery information network.

Seven tailor-made under Tailor-made Training Programs were organized in 2012 to develop human capacity of partners and also Member Countries. According to this, the tailor-made training courses and study tour programs will be continued to conduct 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 actual expenses under cost recovery basis.

Moreover, TD also conducted Improvement of fisheries technology and reduction of the impact from fishing project. Seven activities was conducted and implemented to transfer appropriate technologies and good practices based on the existing expertise of TD covering the area of capture fishery, marine engineering, and fishery information; and strengthen collaboration with relevant agencies at the national and regional level. In 2013, the project will continued to implement activities as follows: 1) exhaust heat recirculation for energy optimization on-board fishing vessels; 2) monitoring of FADs in Andaman Sea; 3) study on destructive fishing gear and practice in Thailand: trawling; 4) study on reduction of energy use in trawl fishing; and 5) development of fisheries database for research survey in Southeast Asia

Tailor-made Training Programs

Seven tailors made were conducted until September 2012 as follows: 1) workshop participation and field trip program on co-management and right- based fisheries in Thailand; 2) Evaluation of Waterfront Environment in Monsoon Asia; 3) short term training for University students on Estuarine fisheries resources condition and the utilization; 4) short-term training course on Basic fishing gears technologies for Burapha University student; 5) short-term training course on Marine engineering and fishing boats control for vocational collage in Samut Sakorn province; 6) Training for trainers on Marine Engineering in collaboration with NATC, Malaysia; and 7) A long-term training course on fishing operation for Tinsulanonda Fisheries College. These tailors made were requested by SEAFDEC collaboration partner by Memorandum of Understanding. There are more than 160 participants in totally attended in those tailors made.

Promotion and Enhancement Fisheries Information

Four exhibitions were conducted by TD to promote and enhance fishery knowledge through TD and SEAFDEC organization visibility to public. More than 50,000 audiences visited TD booths in totally. The fishery knowledge base on TD activities and implementation was presented to the exhibition. Belong to this activity, Moreover, TD joined with DOF-Thailand in the Thai Fishery National Exhibition "Pramong Nomklao". TD collaboration with SEAFDEC Member Countries, Cambodia and Malaysia has furnished their exhibition materials to participate in the display under the theme "Sustainable Fisheries. Moreover, two issue of Advance Fisheries Technology was produced and disseminated to public more than 3,500 copies via TD library network, exhibition, workshop and electronic newsletters and mail.



Improvement of Fisheries Technology and Reduction of the Impact from Fishing

Under this project, seven activities was conducted and implemented to transfer appropriate technologies and good practices based on the existing expertise of TD covering the area of capture fishery, marine engineering, and fishery information; and strengthen collaboration with relevant agencies at the national and regional level. The activities consists of: 1) improvement of post-harvest fish handling on-board fishing vessels; 2) exhaust heat recirculation system for energy optimization on-board fishing vessels; 3) monitoring of FADs in Andaman Sea; 4) study on destructive fishing gear and practice in Thailand: trawling; 5) study on reduction of energy use in trawl fishing; 6) study on the impact of light fishing on fishery resources; and 7) development of fisheries database for research survey in Southeast Asia.

LIST OF PROJECTS

Projects Implemented in 2012

- 1) Tailor-made Training Programs
- 2) Promotion and Enhancement Fisheries Information
- 3) Improvement of Fisheries Technology and Reduction of the Impact from Fishing

Project Proposed for 2013

- 1) Tailor-made Training Programs
- 2) Promotion and Enhancement Fisheries Information
- 3) Improvement of Fisheries Technology and Reduction of the Impact from Fishing

PROJECT DOCUMENT

Program Category: Departmental Program
Project Title: Tailor-made Training programs
Responsible Department: Training Department
Total Duration: Since 2011

1. INTRODUCTION

In each year TD has conducted several regional training courses, that are a channel to transfer activities outcomes and technology which are found out or developed by SEAFDEC to its Member Countries, therefore the participants will come home with knowledge about “how they learn and how they do in SEAFDEC/TD, Thailand”. However continuously, in every year SEAFDEC/TD has requested to conduct some tailor made courses and study tour programs that are a direct follow-up of its advisory activities with and for, organizations in this region. Such courses/programs are referred to as tailor-made courses/programs because they are set up at the request and need of the organizations, with this they can be enormous benefit in developing the capabilities of the workforce, training doesn’t come cheaply. Training needs to be for the right people, it needs to be the right type/design of training and it needs to be at the right time. Due to this the participants background, work responsibilities, objectives and expectation to be able to do at the end of the training course/program will be used for the course designing, it is tailored to the specific training needs of the requesting organization's staff. The tailor-made training courses and study tour programs which are conducted by TD emphasize learning by doing, observing. This is an approach that relies heavily on the participants' active involvement. An important part of learning by doing and seeing are that lecturers act more often as facilitators than as teachers in the traditional sense. The course will not focus on the theory but more dealing with practical application.

2. PROJECT

2.1 Objectives

- 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 Project Description

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 OF ACTIVITIES IN THE YEAR 2012

Explain briefly the major achievements of projects and activities conducted in the year 2012. This section is not applicable for newly proposed programs.

Project/Activity Title	Duration
1. The tailor-made program on “workshop participation and field trip program on co-management and right- based fisheries in Thailand”. The program was conducted for three participants from Senegal which under funding support from JICA. It focused upon the approaches and case studies of coastal and small-scale fisheries management; the approaches to work towards co-management, right-base fisheries and involving local communities and applying eco-system principles to coastal fisheries	3-9 February 2012

management. The course covered the presentation discussion, regional workshop participation and visited to related places.	
2. The tailor-made training course on Evaluation of Waterfront Environment in Monsoon Asia. There were 15 students from Kagoshima University attended to this training program.	15-14 February 2012
3. The short term training for University students on Estuarine fisheries resources condition and the utilization (B-53). The twelve days of the short term training course was conducted at SEAFDEC/TD, there were 39 students from nine difference Universities attended in the training course.	23 April – 4 May 2012
4. The short-term training course on Basic fishing gears technologies for Burapha University student. The course was conducted for 50 university students and it objected to build up knowledge of the students on basic fishing gears construction.	28-31 May 2012
5. The Short-term training course on Marine engineering and fishing boats control for 21 students from vocational collage in Samut-sakorn province. The course was objected to provide knowledge on marine engineering and to build up experience to the students on the basic fishing gears construction and operation as well as on the fishing boat control and navigation.	14-28 August 2012
6. Training for trainers on Marine Engineering, the course is designed for marine engineering trainers from NATC and DOF/Malaysia; it was conducted in Malaysia under the collaboration with NATC. The course aim to strengthen understanding and skill of participants on engine room machineries, deck machinery, refrigeration system, electronic system for varies equipment on board, solve troubles shooting and duty officers on board. There were 22 participants attended to this course	18-27 September 2012
7. A long-term training course on fishing operation for Tinsulanonda Fisheries College. This training course is conducted under the collaboration between TD and the Office of Vocational Education Commission. The training is a part to support the country in producing seamen and navigators for fisheries industrials of Thailand. The course is conducted for four months, from 3 October 2012 to 24 February 2013. There are 12 students attending on this training course for this batch.	3 October 2012 to 24 February 2013

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

At least five tailor-made training programs will be conducted in the year 2013 (the course titles, programs and activities will be designed base on the requirements/needs from the training partners).

5. EXPECTED OUTPUTS

TD will continuously be a part to support Member Countries or other organizations/institutes to build up human capacity on the fisheries related issues especially base on the need and requirement aspects of the training partners/donors.

PROGRAM DOCUMENT

Program Category: Departmental Program
Program Title: Promotion and Enhancement Fisheries Information
Responsible Department: Training Department
Total Duration: Since 2012

1. INTRODUCTION

The Information Strategies for Enhancing SEAFDEC Visibility and Communication which was endorsed by the SEAFDEC Council in 2006 are used as a common policy framework for information-related activities of the organization. In 2009, the strategies were revised and simplified. However, they still emphasize raising SEAFDEC image at international, regional, national levels and enhancing communication and information sharing both within SEAFDEC and with Member and non-Member Countries, other international/regional organizations, and the public.

Moreover, the Plan of Action on Sustainable Fisheries for Food Security Towards 2020 which was adopted in ASEAN-SEAFDEC Conference, “Fish for the People 2020” and “Adaptation to a Changing Environment” in Bangkok, Thailand during 13-17 June 2011 emphasize the enhancement of regional fishery information systems and mechanisms to facilitate sharing, exchange and compilation of information

Following the information strategy of SEAFDEC and the Plan of Action on Sustainable Fisheries for Food Security Towards 2020, TD will initiate the project on “Promotion and Enhancement Fisheries Information” to promote and enhance fishery information which implement by TD which has benefits to Member Countries and public.

2. PROGRAM

2.1 Objectives:

- 1) Public Relation of TD and SEAFDEC role and implementation in the region to public;
- 2) Encouragement knowledge on sustainable fisheries information to public; and
- 3) Enhancement of coordination on fisheries information with other organizations and institutions.

2.2 Program Description:

In 2013, TD will continue to implement the project under Departmental Program, namely, “Promotion and Enhancement Fisheries Information”. This project will consist of three main activities. They are: 1) Promotion and enhancement of fisheries knowledge; 2) Production of fisheries information materials; 3) Human capacity building on Information and Communication Technology; and 4) Strengthening of fishery information network.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

Project Activity Title	Duration
1) Promotion and enhancement of fisheries knowledge <ul style="list-style-type: none"> • Exhibition on Fishery Resource Conservation and promotion SEAFDEC and TD activities for Children Day at Agriculture Museum and Pomprachunlajomklao Navy was organized. There are about 5,300 audience visited TD booth. • Exhibition on fishing gear technology and TD activities was promoted to enhance fisheries knowledge for public in 120th Anniversary of Ministry of Agriculture and Cooperatives, Thailand at Agriculture Museum. • Exhibition at the annual national fair “Pramong Nomklao” was organized in collaboration with the Thai Department of Fisheries in staging a fisheries TD presents fisheries activities under the theme of “Sustainable Fisheries”. Moreover, in collaboration between SAFDEC and Member Countries, Cambodia and Malaysia have furnished their exhibition materials to participate in the display under the same theme. 	14 Jan 12
	1-5 Apr 12
	29 Jun-8 Jul 12

<ul style="list-style-type: none"> Exhibition on fishing technology and TD activities was promoted and enhanced fisheries knowledge to students and public in exhibition of Ocean Day at International School in Thailand. Moreover, the drawing pictures contest from SEAFDEC Member Countries which an activity in SEAFDEC-ASEAN Conference 2011 also shown in this exhibition. 	28 Jul-1 Aug 12
<p>2) Production of Advance Fisheries Technology magazine</p> <ul style="list-style-type: none"> Advance Fisheries Technology Volume 4 issue 1 in theme of “Fisheries Data Information” was produced 2,000 copies and distributed to public as enhancement fisheries knowledge and public relation of TD and implementation activities Advance Fisheries Technology Volume 4 issue 2 in theme of “Improvement of Working Standards for fisher” was produced 2,000 copies and distributed to public as enhancement fisheries knowledge and public relation of TD and implementation activities 	<p>Jan-Apr 12</p> <p>May-Aug 12</p>
<p>3) Establishment of fishery information network</p> <ul style="list-style-type: none"> Eight e-mail group networks are established and maintained to circulate fishery information on the topic of combating IUU fishing, fishing gear technology. Moreover, information and public relation of TD activities and implementation are promoted via this network. 	Jan-Dec 12

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Project Activity Title	Duration
<p>1) Promotion and enhancement of fisheries knowledge</p> <p>The knowledge on fisheries topic in the region including the implementing activities on TD projects in collaboration with SEAFDEC Member Countries will be promoted and enhanced to public via national and international exhibitions as required</p>	Jan-Dec
<p>2) Production of fisheries information materials</p> <ul style="list-style-type: none"> The Advance Fisheries Technology (AFT) Magazine Three volumes of AFT magazine will produce by review and present new and advance fisheries technology in the world, which might be applied to the Southeast Asian Region. Moreover, TD project implementation in collaboration with SEAFDEC Member Countries will also be promoted worldwide in this magazine. The AFT magazine will be produced as hardcopy and electronic file and then, distributed to TD network and the public via e-mails, the mail, workshops, meetings, exhibitions and <i>etc.</i> VDO production Creation of VDO on fisheries information will be conducted such as pelagic longline by smart reel system and <i>etc.</i> Moreover, VDOs on fishing gear technology subject which produced by TD will be revised and updated 	<p>Apr. Aug. Dec.</p> <p>Jan-Dec</p>
<p>3) Human capacity building for SEAFDEC information staffs</p> <p>The knowledge, skill and experience of information staffs will be enhanced and developed by take course of relevant ICT training program with outside institution such as strategy of Public Relation, website design and <i>etc.</i> Moreover, in 2013, TD will be hosted to organize the 14th SEAFDEC Information Staff Program meeting which development of knowledge, skill and experience of SEAFDEC information staffs including strengthen of strategy of SEAFDEC visibility to worldwide.</p>	Jan-Dec
<p>4) Strengthening of Fishery Information Network</p> <p>This activity will continue to establish and maintain electronic mail group network. Moreover, other scheme under this activity might be created such as the Meeting on Fishery Information and Establishment of Network will be organized in Thailand as a pilot in first step. The objectives of this meeting are the establishment of fishery information network to share and exchange related fishery information in the future, consultation and improvement of training course curriculum. Some of training courses such as university student training courses will be used as case study for improvement. Representative(s) from other organizations/ institutions in Thailand will be invited to participate in this meeting.</p>	Jul.

4.2 Expected Outputs

- Public understand role and implement activities of TD and organization in the region;
- Public more understand on fisheries knowledge; and
- Sustainable cooperation between SEAFDEC and other organizations and institutions.



PROJECT DOCUMENT

Program Category:	Departmental Program
Project Title:	Improvement of Fisheries Technology and Reduction of the Impact from Fishing
Responsible Department:	Training Department
Total Duration:	Since 2012

1. INTRODUCTION

This project has been initiated with the aim to improve, develop, and promote appropriate fisheries technology to support sustainable management and development of fisheries. Over the years, several activities focusing on technology transfer, research and development, demonstration and sea trials, and survey have been implemented under this project.

Currently, the project under the departmental program of TD can be categorized into two major areas: (i) promotion of appropriate technologies and practices fishing gear and marine engineering; and (ii) fisheries information for fisheries management.

The ongoing projects under each category include:

- 1) Promotion of appropriate technologies and practices of fishing and marine engineering
 - 1.1 Improvement of post-harvest fish handling on-board fishing vessels
 - 1.2 Exhaust heat recirculation system for energy optimization on-board fishing vessels for refrigeration system
 - 1.3 Monitoring of FADs in Andaman Sea
 - 1.4 Preliminary study on the possible impact of selected fishing gears: modified trawl net and dredging in Thailand
 - 1.5 Study on reduction of energy use in trawl fishing
 - 1.6 Study on the impact of light fishing on fishery resources
- 2) Fisheries information for fisheries management
 - 2.1 Development of fisheries database for research survey in Southeast Asia

2. PROJECT

2.1 Objectives

Overall objectives of this program include:

- 1) To transfer appropriate technologies and good practices based on the existing expertise of TD covering the area of capture fishery, marine engineering, and fishery information; and
- 2) To strengthen collaboration with relevant agencies at the national and regional level.

2.2 Project Description

Improvement of post-harvest fish handling on-board fishing vessels

The project was financially supported by Thailand Fish Marketing Organization (FMO-Thailand) with the aim to promote and support utilization of fisheries resources through capacity building program/activity on improvement of post-harvest fish handling techniques. The activity of this project includes the on-site training course on introduction of the shurry system using sherbet ice that can be produced from the seawater on-board fishing vessels.

Exhaust heat recirculation system for energy optimization on-board fishing vessels

With the aim to optimize the use of energy on-board fishing vessels, TD has initiated the development of a system to recirculate the exhaust heat of the fishing vessels using financial support from FMO-Thailand. A prototype of the exhaust heat recirculating system has been developed using the “calcium chloride salt system” which can be equipped on-board the fishing vessels. The introduction of this system to key stakeholders and fishers will be carried out.

Monitoring of FADs in Andaman Sea

During the past years, TD in collaboration with Department of Fisheries Thailand has jointly modified the fixed FADs in order to explore the potential fishery resources in Andaman Sea. After deployment of the fixed FADs in Andaman Sea by M.V. SEAFDEC in 2009 and 2010, the monitoring survey of the fishery resources around the fixed FADs area was carried out.

Preliminary study on the possible impact of selected fishing gears: modified trawl net and dredging in Thailand

In order to support sustainable development and management of fisheries, TD has jointly carried out a series of field survey on the selected fishing gear and devices including modified trawl net and dredging in Thailand. A set of recommendations with the fact-findings from the field survey will be reported. The report could be used as national/regional reference for further readjustment t of the measures to be considered by the responsible agency.

Study on reduction of energy use in trawl fishing

It is recognized that trawling is the main fishing gear using in the Southeast Asian countries including Thailand. The cost of investment for trawling is mainly from fuel consumption due to the practice of trawling and construction of the trawl net. This project was developed based on the expertise of TD on fishing gear technologies in order to provide fishers on ways to reduce the consumption of the fuel through modification of the trawl net.

Study on the impact of light fishing on fishery resources

This activity has been jointly implemented by TD and DOF-Thailand and Myanmar. The specific objective of this project is to obtain scientific information on the impact of light fishing gears/practices on juvenile of commercially important species.

Development of fisheries database for research survey in Southeast Asia

Based on the results of the research survey cruises carried out by TD and Deep Sea Fishery Technology Research and Development Institute of DOF-Thailand, a system of database for all data and information collected from the surveys will be developed to provide information which will be useful for development of an alternative fishery resource in the region.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

Project/Activity Title	Duration	Remarks
Improvement of post-harvest fish handling on-board fishing vessels	Nov	On-site training course on promotion of fish handling and preservation techniques using sherbet ice in Chumporn, Rayong, Phuket and Songkhla Province.
Exhaust heat recirculation system for energy optimization on-board fishing vessels	Jan to Aug	Development of the prototype of the exhaust heat recirculating system was completed. Demonstration and promotion of the system will be conducted.
Monitoring of FADs in Andaman Sea	Jan to Nov	Data of fish larvae, water quality, and fish samples collected nearby FADs have been analyzed. The final report of the activity will be made by the end of 2012.
Preliminary study on the possible impact of selected fishing gears: modified trawl net and dredging in Thailand	Aug	In collaboration with DOF-Thailand, the field trips to survey paired-trawl and bottom otter-board single trawl was carried out in Trat and Samut Sakorn provinces. It was found that some trawlers in Thailand are now using a modified trawl net, so-called "crocodile net" which the height of the net mouth could be ranged up to 20 meters. It is assumed that demersal and pelagic can be effectively captured by this modified net. Regarding the dredging, the survey was conducted in

		the area of upper Gulf of Thailand (Prachupkirikhan, Petchaburi, and Samutprakran provinces). The reports of the survey of both gears are now developing.
Study on reduction of energy use in trawl fishing	Jan to Jun	A set of prototype of modified trawl net was constructed and designed for 14-18 meter otter board trawler. The sea trial of this modified net is scheduled in November 2012 using M.V. Plalung. It is planned that the comparison of energy consumption between the conventional and modified type of trawl nets will be conducted. It is envisaged that the reduction of fuel use for the modified trawl net can be made up to 20-25% as compared to the conventional one.
Study on the impact of light fishing on fishery resources	Jan to Feb	TD staff assisted DOF-Myanmar to conduct the national study on the impact of squid fishing with light on by-catch of juvenile of commercial important fish species in Kow Thaung, Myanmar. TD staff also assisted DOF-Thailand to conduct the national study on impact of fishing activities using lights in the artificial reefs area on by-catch of juvenile of commercial important fish species.
Development of fisheries database for research survey in Southeast Asia	Jan to Dec	“Fishery Resource Survey Data Management System” has been developed in collaboration with DOF-Thailand. All information of the survey cruises conducted previously by research vessels of TD and DOF – Deep Sea Fishery Technology Research and Development Institute will be compiled and input to the system.

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Improvement of post-harvest fish handling on-board fishing vessels

No activity in 2013.

Exhaust heat recirculation for energy optimization on-board fishing vessels

Prototype of the exhaust heat recirculating system developed using the “calcium chloride salt system” will be introduced to key stakeholders and fishers. However, financial support to the activity will be discussed with FMO-Thailand.

Monitoring of FADs in Andaman Sea

Report of the result on the study on fixed FADs in Andaman sea will be released in early 2013. This information will be shared through TD’s website.

Preliminary study on the possible impact of selected fishing gears: modified trawl net and dredging in Thailand

Report of the study will be released and shared to the key stakeholders. It will also be disseminated through the TD’s website.

Study on reduction of energy use in trawl fishing

Results of the sea trial to compare the fuel consumption between the conventional and prototype trawl net will be analyzed and released. Subsequently, the follow-up activity after report dissemination will be further discussed with the key stakeholders such as Department of Fisheries Thailand, Trawlers Association of Thailand, etc.

Study on the impact of light fishing on fishery resources

No activity in 2013.

Development of fisheries database for research survey in Southeast Asia

It is planned that the database system can be launched through the website of TD.

4.2 Expected Outcomes

Exhaust heat recirculation for energy optimization on-board fishing vessels

After discussion with the key stakeholders, the system will be transferred to the appropriate agencies. This system can be used as the prototype for further modification by other agencies. However, TD would continue to assist in transferring knowledge on the system modification for energy optimization on-board fishing vessels.

Monitoring of FADs in Andaman Sea

It is envisaged that future joint research activities between TD and Deep Sea Fishery Technology Research and Development Institute to follow-up the application of fixed FADs in Andaman Sea will be developed.

Study on reduction of energy use in trawl fishing

Summary result of the study will be used as a basis for development of the appropriate promotional materials for further dissemination to the key stakeholders.

Development of fisheries database for research survey in Southeast Asia

It is envisaged that the database system can be used to stimulate future research activities related to offshore fisheries development.



SEAFDEC DEPARTMENTAL PROGRAMS FOR THE YEAR 2012-2013: AQUACULTURE DEPARTMENT

OVERALL REVIEW

The accomplishments of SEAFDEC/AQD during the period covered by this report are based on strategic thrusts which overall, are expected to assist the SEAFDEC Member Countries in addressing issues related to aquaculture development and its contribution to food security. The strategic thrusts which best describe the Research and Development agenda of AQD center on: (i) development of science-based aquaculture technologies; (ii) verification, demonstration and transfer of aquaculture technologies appropriate to the Asian region, and (iii) building the capacities of the aquaculture sector in the region.

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 recommendations made during the 2011 ASEAN-SEAFDEC Fisheries Conference and the framework of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region in the next decade.

For 2012, AQD has implemented over 90 studies under five thematic Programs which focus on: (i) Meeting Social and Economic Challenges in Aquaculture, (ii) Quality Seed for Sustainable Aquaculture, (iii) Healthy and Wholesome Aquaculture, (iv) Maintaining Environmental Integrity through Responsible Aquaculture; and (v) Adapting to Climate Change Impacts. Activities in these Programs involve research and verification 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.

This report presents the highlights of activities and accomplishments in 2012 (January to September) under various Program objectives:

Quality seed for sustainable aquaculture

One of the main constraints to enhancing aquaculture production in the region is the inadequacy of supply and quality of seed stocks and the required domesticated broodstocks. The issues on the supply of quality seed are of primary concern in order for the Member Countries to meet the increasing internal demands for aquatic products and to maintain their positions as major suppliers of aquaculture products to international markets.

In this Program are studies and activities that will determine optimal conditions and methods for the production of quality seedstock in sufficient quantities. The research activities entail the use of conventional methods of stock improvement such as domestication, broodstock management, strain evaluation and selective breeding or genetic improvement of traditional and emerging freshwater and marine species.

Development of good quality broodstock and implementation of proper broodstock management protocols

As a pre-requisite to selective breeding programs, domestication is initially pursued through monitoring of the genetic structure of base populations, establishing husbandry techniques, developing suitable diets for the different life stages and culture of live food necessary for good reproductive performance. With regard to shrimps, techniques are being developed for the sustainable production of good quality captive *Penaeus monodon* breeders. Results indicate that breeding performance of shrimp spawners can be enhanced through administration of protein and lipid-rich feeds. Concerning the giant freshwater prawn, *Macrobrachium rosenbergii*, efficient and low-pollution diets for use in rearing potential broodstock are being developed and tested. Improvements in the diet formulation have also been done through higher inclusion or replacement levels of fishmeal protein with cowpea meal protein in the grow-out diet. Efforts have also been made to improve the maturation diets for donkey's ear abalone,

Haliotis asinina. Eggs from abalone breeders fed on seaweed diet were significantly smaller than those fed the formulated maturation diet. Meanwhile, for milkfish, *Chanos chanos*, AQD and local partners have recently initiated, through the funding support of the Philippine Department of Science and Technology (DOST), studies on the development of quality broodstock using conventional stock monitoring and management protocols. Like in milkfish where molecular markers that will identify stocks and consequently aid in determining genetic quality are being developed, the same approach is being done for several other commercial aquaculture species like mud crabs, shrimp, abalone and the seaweeds *Kappaphycus* and *Eucheuma*. Studies are also in-progress to improve the existing seaweed strains through isolation and culture of protoplasts from red seaweeds with potentially superior genetic traits.

With regard to emerging species, experiments are in-progress to develop broodstock conditioning methods for the sandfish or sea cucumber since it has been observed that old spawners decrease in body size and exhibit reduced reproductive performance. Apart from conditioning techniques, sandfish reproductive performance is also being improved through refinements in the spawning protocols. Efforts are also being made to domesticate and evaluate the culture potential of another emerging species, the indigenous freshwater prawn, *M. lar*. To date, no successful metamorphosis to the post larval stage has been obtained; hence, larval rearing protocols for this species are continuously being refined. Another species that is currently being domesticated is the climbing perch, *Anabas testudineus*.

Refinement of the hatchery and nursery management methods to improve seedstock quality and production of various commodities

Concerning the tiger shrimps, part of the study on the sustainable production and development of broodstock and high health fry is to survey hatcheries to determine the current status of the shrimp hatchery industry. With regard to mud crab, a new collaborative project which is part of the DOST National Mud Crab Science and Technology Program was initiated. The project aims to develop an optimal hatchery protocol which later will be disseminated through training and technology transfer. Studies on the verification of feeding and water management methods in mud crab seed production are also on-going. Trials on the frequency of oxytetracycline application (daily, every other day or every 5 days until the megalopa stage) in seed production were conducted. Preliminary results show that molt death syndrome was noted in larvae that have been treated more frequently with the chemical. In another study which assesses the impact of the use of enriched Artemia to improve larval survival, it was noted that survival from zoea 4 to megalopa was better in Selco-enriched Artemia compared with the control. The influence of stocking density and tryptophan-supplemented diets on the survival and growth of mud crab *Scylla serrata* in the nursery phase is likewise being conducted. With regard to marine fish, nutritional intervention through tryptophan supplementation in the diets was used to minimize cannibalism during the larval and nursery stages. Preliminary trials using grouper larvae which involved weaning fish to a formulated diet were started. For milkfish, initial feeding trials comparing the reproductive performance of broodstock fed fortified vs non-fortified (control) diets were conducted. In abalone, a strain of thraustochytrid *Schizochytrium* sp. (LEY7) that contains high lipid and omega 3 fatty acid levels, such as DHA will be used for feed enrichment.. Mass production of the aforementioned thraustochytrid strain is on-going. Mass production methods for natural food organisms (*Nitzschia* sp, *Diploneis* sp and *Cocconeis* sp) for postlarval abalone are also being refined. Another nutritional intervention to improve abalone hatchery production is the administration of microparticulate diets as alternative feed. Feeding trials in large-scale tank systems are being conducted. Preliminary results showed that abalone reared on agar-based microparticulate diet resulted in bigger shell lengths and higher survival rates. Finally a study that deals with the production of *Gracilariopsis heteroclada*, the primary diet of abalone, was implemented.

With regard to emerging species for aquaculture, the reproduction and seed production of climbing perch, *A. testudineus*, a species indigenous to Laguna de Bay, is currently being studied. Rearing and feeding protocols for hatchery rearing of seedstock shall be improved to increase survival rate. Another endemic species, the silver therapon, *Leiopotherapon plumbeus* is being studied to determine the optimum larval rearing protocol. Concerning the pompano *Trachinotus blochii*, hatchery techniques are being refined to improve seed production. One of the refinements done is on the development and evaluation of weaning diets. Likewise, a verification study on the brackishwater nursery pond culture



of pompano using formulated diets with varying lipid levels will be conducted. Research on the biology of reproduction of another emerging species, the spotted scat *Scatophagus argus* or kikeru will be undertaken as well. To improve sandfish juvenile survival, new sources of broodstock were collected from various places like Igang in Guimaras Island and Ajuy in northern Iloilo and bred in natural sea pens.

Concerning the species for stock enhancement, the initial live food for the larval Napoleon wrasse *Cheilinus undulatus* is being assessed. The distribution of Napoleon wrasse in Bohol was also surveyed. This information is vital to the management of Napoleon wrasse in known natural habitats. The seahorses, *Hippocampus barbouri* and *H. comes* are continuously being propagated in the SEAFDEC/AQD hatchery for possible release in Taklong Island Marine Reserve, a site which is currently being assessed for its suitability for stock enhancement.

Development of schemes for the production, management, maintenance and dissemination of genetically selected and improved stocks

Selective breeding programs have begun for selected commercial species like the crustaceans. For mud crab, stress tests are being done to determine strain level differences in terms of better fitness attributes of stocks. For tiger shrimp, F1 batches from founder stocks collected from several sites (Bohol, Davao and Antique) are currently being grown to broodstock size. Subsequent batches which have attained more than 50 g weights will be considered for use in the breeding program. 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. In 2011, a reciprocal mating scheme was tried to improve growth and breeding performance in two lines of the giant freshwater prawn. In 2012, two other broodstock schemes are being assessed: a) frequent male broodstock replacement and b) sex ratio experiment. Concerning the tilapias, saline-tolerant strains are being screened for subsequent selective breeding of enhanced traits. The growth trial in brackishwater ponds and a sensory evaluation on the four stocks grown and harvested from the same pond experiment were completed recently and data are being analyzed. With regard to local commercial abalone species (*H. asinina*), hybridization has been done by crossing this with other Philippine abalone species, *H. planata* and *H. glabra*, to produce stocks with improved traits. A total of 140 hybrids were produced and hybrids stocked in sea based cages are being monitored continuously for growth performance. To improve the fecundity and seed quality of the abalone *H. asinina*, wild stocks acquired from various places in the Philippines (Masbate and Palawan) were used for breeding. The performances (growth) of the juveniles coming from these breeders are currently being monitored. Results from these trials will be useful for later genetic selection. Concerning the seaweeds, methods to develop resistant strains of *Kappaphycus* and reduce the presence or growth of epiphytes are being studied. A grow-out experiment is also being done to determine the growth of tissue-cultured *Kappaphycus* using different commercial fertilizers. Preliminary results showed that there were no significant differences in growth between fertilized and unfertilized stocks.

Meanwhile, from January to September, the SEAFDEC/AQD abalone demonstration hatchery produced 80,180 pcs. of 5-8 mm shell length abalone juveniles. The survival rate from veliger to juveniles (90 days of culture) ranged from 0.28 to 1.0%. The juveniles have been reared further to 1.1 - 1.5cm shell length and then sold.

Enhancement of adoption of economically viable systems to produce sufficient seedstock

Several fish/shellfish production projects are being implemented in SEAFDEC/AQD to demonstrate the viability of small-scale and/or large-scale seed production systems. Mass production of sex-reversed and mixed-sex Nile/red tilapia fingerlings as well as large scale production of abalone juveniles, are continuously being done. From January to September, around 130,000 pcs of three month old abalone juveniles were produced. Meanwhile, from January to September, the SEAFDEC/AQD abalone demonstration hatchery produced 80,000 pcs of 5-8 mm shell length abalone juveniles after 90 days of culture.

Capacity-building of fish farmers and other industry stakeholders on appropriate breeding and larval rearing technologies are another objective of the Program. To meet this objective, several specialized training courses were offered to local government representatives, private sector investors, and feed company staff (BMEG) and fisherfolk. These were on sandfish, abalone, mudcrab, marine fish, 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. Technical assistance was also provided to local and international private sector clients through the Agree Build Operate and Transfer Aqua Negosyo Program.

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.

Finding different sources of fish meal substitutes and development of effective feed management schemes that incorporate sound management

Studies were continued to address this objective. In 2012, the experiment to optimize the feeding and management strategies of growing milkfish in marine floating net cages using improved milkfish practical feed with optimum inclusion of soybean meal (SBM) and soy protein concentrate (SPC) was conducted. Milkfish were fed the diet in phases: starter, grower, and finisher diets. Efforts were also continued to improve the nutritional value of locally available feed resources by fermentation. Fermentation experiments were carried out to standardize the protocols for small-scale fermentation prior to increasing the volume of fermentation. With regard to mud crab, varying levels of copra meal (0, 10, 20, 30, 40 and 50% level) as replacement to soybean meal in diets for *Scylla serrata* are being tested. No significant differences in body weight, survival, increase in carapace, body weight and molting interval was noted between the different treatments. For giant freshwater prawn, *M. rosenbergii*, the experiment to determine stocking densities (5, 10, and 15 prawns/m²) which can be supported solely by periphyton productivity in cage culture in Laguna lake was conducted. Significantly better growth was observed at lowest stocking density; however, no significant effects on survival among the treatments were observed.

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 is one of the test species that is being assessed to address this objective. Nine test diets at different protein levels (38, 46 and 54% CP) and lipid levels (8, 11 and 14%) were formulated for feeding experiment in tanks using pompano fry. After 14 weeks, survival rates in all dietary treatments were almost 100% and average body weights ranged from 30-58%.

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

Demonstration and verification experiments are being implemented to address this objective. Intensive grow-out culture of milkfish in brackishwater ponds and using alternative day feeding was conducted. After 45 days, average body weight of fish fed on alternate days was 164 g and 293 g for those fed daily. An experiment was also done to assess the grow-out performance of mangrove red snapper fed SEAFDEC formulated diet during intensive culture in brackishwater ponds. Likewise, semi-intensive culture of pompano in brackishwater ponds using commercial diet was also assessed. Concerning polyculture of tilapia and freshwater prawn, two more runs were conducted to compare the performance of the stocks fed SEAFDEC/AQD formulated feed and commercial feed during rearing in net cage in freshwater dam/reservoir in Dingle, Iloilo. Growth, survival and feed conversion ratios were better in both species fed the SEAFDEC/AQD formulated diet compared with those fed the commercial feed. Large-scale demonstration of this technology is recommended. Another study conducted is on the economics of producing mud crab juveniles for soft-shell crab farming.



Investigation on the efficacy of probiotics and rationalization of the need and application of diagnostics that will ensure biosecurity within the culture systems

One of the on-going studies in pursuit of this objective focuses on examining the effects of polyhydroxybutyrate (PHB) supplementation on the different developmental stages of *Penaeus* sp.. Beneficial effects expected from PHB supplementation include protection from pathogenic infections, growth enhancement, and improved larval survival. In another related study, the total PHB production from spore-forming microbial communities isolated from different sources has been assessed. With regard to screening of anti-microbial activities of crude extracts from Philippine red seaweeds, preliminary screening for antiviral activities was conducted initially using commercially available carrageenan. Subsequently, crude carrageenan preparations from red seaweeds cultured at SEAFDEC/AQD will be tested. Concerning the abalone, studies are also being conducted to determine the bacterial diversity and algal community structure in biofilms of settlement plates for larvae. Data gathering from both successful and failed larval rearing runs have already started and will be continued for comparison. Meanwhile, a proposal on the epidemiology, toxicology and other etiologies of the Early Mortality Syndrome (EMS) in shrimp (*P. monodon* and *Litopenaeus vannamei*) has also been prepared for implementation in 2013. The study is considered a high priority in view of the region-wide occurrence of EMS in Southeast Asia and the emergency concerns expressed by SEAFDEC and NACA Member Countries.

Finding effective alternative safe drugs/chemicals to manage aquaculture diseases in lieu of the harmful chemicals and drugs

One of the initiatives being undertaken to address this objective involves examining the host response to pathogens and developing control methods such as the use of natural immunostimulants for marine fishes. To counter the several epizootics that occurred in the AQD marine fish hatchery, an experiment on host defense of *Lates calcarifer* against *Amyloodinium oocelatum* has been implemented. *Amyloodinium*-infested snapper larvae/juveniles were collected and the parasite was allowed to complete its life cycle in tanks to produce free-swimming infective dinospores as inoculum for the infection experiment. Assessment of immune parameters and expression of antimicrobial peptides upon exposure to infective dinospores and trophonts is also on-going. Apart from these studies, arrangements have also been made to initiate two new studies. One of such studies will focus on the development of bacterial and viral vaccines for marine and freshwater species including the application of nanoparticles for vaccine delivery. The other study will develop immunostimulants and vaccines and will establish disease challenge protocols for selective breeding of shrimps and crabs with focus on traits such as fast growth and resistance to diseases.

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. Specifically, the program will: 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; b) identify appropriate extractive species that may be used in integrated multitrophic aquaculture (IMTA); c) develop and promote efficient and suitable environment-friendly culture systems; and d) conduct 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

Studies were continued to assess the impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems. The bathymetric survey of Igang Bay in Guimaras Island has been completed. Mapping of seagrass beds and coral areas in the same site were also done. Water quality parameters for Igang Marine Station were also monitored. The assessment and documentation of species in and around the marine cages and adjoining habitats at Igang Marine Station have also been done and is expected to be completed in 2012. For the cage culture site of the Binangonan Freshwater Station, water quality monitoring was conducted in conjunction with the on-going experiments in the area.

Identification of appropriate extractive species that may be used in integrated multitrophic aquaculture (IMTA)

Various experiments are on-going to identify appropriate extractive species that may be used in IMTA. Among the extractive species being investigated are the sandfish *Holothuria scabra*, the bivalve mollusk *Anodontia philippiana* and the seaweed *Gracillaria bailinae*. The co-culture of these extractive species with other commercially important commodities is being investigated. One of these is the polyculture of sandfish, *Holothuria scabra*, with milkfish and other selected marine fish species. The testing of various marine fish species in combination with sandfish in ponds and pens in ponds will give an indication of the compatibility of sandfish with various marine fish species. Co-culture trials of sandfish with milkfish and sandfish with pompano are on-going.

Development and promotion of an efficient and suitable environment-friendly culture systems

As part of the effort to develop and promote efficient and suitable environment-friendly culture systems, arrangements have been made to initiate experiments that will evaluate culture parameters for optimal growth and survival of sandfish. Sites in Iloilo and Guimaras for culture and sea ranching of sandfish have been assessed and small-scale pond and pen culture trials at these sites are on-going. In another study, the carrying capacity of inland water bodies in the Philippines is being modeled using the Cage Aquaculture Decision Support Tool (CADS Tool). The model was initially developed for marine cage systems and is being refined for application in freshwater production systems. An initial trial of the CADS tool has been done for Lake Bato and for some lakes in the Philippines.

Conduct of biological and ecological studies on species with potentials for resource enhancement

A number of biological and ecological studies on species with potentials for resource enhancement are in-progress to address this objective. These species are the giant clam *Tridacna gigas*, abalone *Haliotis asinina*, and three species of mud crabs *Scylla serrata*, *S. olivacea* and *S. tranquebarica*. Concerning the giant clam, a total of 214 clams were stocked in nursery cages in the Marine Protected Area (MPA) of Brgy Cata-an in San Joaquin, Iloilo. Mortalities were observed due to harsh weather conditions during the early part of 2012 and only 50 clams remain. Sites were already identified for re-stocking. Constant refinements are being made to secure the remaining clams. Meanwhile, in another study which focuses on mud crabs, efforts are being made in the collection of information on its population and fisheries at the study site in Ajuy, Iloilo. Since January 2012, a total of 904 crabs have been collected and comprised *S. olivacea*, *S. serrata* and *S. tranquebarica*. Samples from the study site are also being collected for genetic characterization. With regard to abalone, *H. asinina*, monthly monitoring survey is being conducted on the growth and survival of released wild and hatchery-bred stocks. A total of 65 abalone have been collected from all 10 transects. Of these, 98.5% were wild and 1.5% wild released recaptures (recaptured-wild). Abalone number was highly and positively correlated with the transects dominated by dead branching corals with encrusting algae. This supports the previous finding that abalone may be utilizing coral branches as shelters and encrusting algae as food. Genetic characterization of abalone samples is being conducted to determine the impacts of released hatchery-bred abalone on the wild population.

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 2012, studies have focused on examining how climate change affects the biology of various species presently farmed and the various support systems. In tropical aquaculture fishes, very little information is known on how gonadal maturation and spawning is affected by elevated temperature. Hence, to address this, initial investigation was made in rabbitfish. As expected, gonadal development and spawning performance of rabbitfish breeders were high when they are at ambient temperature (27-29°C).



However, spawning was affected when breeders were exposed to temperature of 33°C. The effects of elevated water temperature were also evaluated on embryonic development of the other important marine fishes such as the milkfish, rabbitfish and the Asian sea bass and on important crustaceans and mollusks such as the mud crab and abalone. In marine fishes, although embryonic development proceeded normally in embryos incubated in 31°C, hatching rate was lower compared with those incubated in ambient temperature (28-29°C). With regard to mud crab, larvae (zoea 1) survived very well in 31°C and least in 33°C. For abalone larvae, elevated temperature (33°C) had no significant effect on settlement rate and survival. Highest settlement rate and survival was observed in larvae at 31°C. In another study, the interactive effects of temperature, pH and salinity were examined in rotifers, an important zooplankton that is commonly used in fish hatcheries. No interactive effects were determined, indicating that rotifers may tolerate the unfavorable conditions that are predicted to happen in the future due to climate change.

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: (1) enhancing the role of aquaculture in addressing food, income and livelihood security through improved governance, multi-agency collaboration, and comprehensive and inter-disciplinary approaches; 2) promoting sustainable aquaculture through enabling policies that support the management of natural and environmental resources; 3) enabling mechanisms, institutions and infrastructure to encourage adoption of better aquaculture practices; 4) understanding and improving linkages from production to marketing and trade of fishery products to support small and medium enterprise (SME) development; and 5) strengthening the capacity of aquaculture stakeholders by mainstreaming specific rural and peri-urban aquaculture programs and policies in local, national and international development programs. The accomplishments are described below:

Prioritizing collaborative R&D in aquaculture in the region

Studies were initiated to co-establish with stakeholders some baseline information for designing demonstration activities that promote the culture of new and indigenous aquaculture species in inland and coastal communities. Activities are also on-going to define the modalities for introducing and implementing aquaculture technologies and stock enhancement using hatchery-bred seeds identified and tested in selected freshwater, brackishwater and marine environments. Preliminary findings revealed that sustainability of technology adoption to form small and medium enterprises are constrained by the following factors: (i) lack of reliable supply of tilapia breeders in remote rural areas; (ii) organizational and solidarity commitment, and (iii) inadequate financial management.

Allocating R&D resources to address emerging issues

The Program has recommended policy and up-scaled ordinances to support and maintain fisheries management mechanisms resulting from on-field studies. For instance, assistance was extended to local government units in formulating ordinance on abalone catch size regulation (6 cm) as one of the strategies for managing enhanced stocks in Sagay Marine Reserve. Also, to increase adoption of full-cycle aquaculture (FCA) technologies by fish farmers, especially for high value species, training and IEC on use of seeds for aquaculture and provision of seeds from aquaculture to motivate adoption of FCA during start-up in project sites were done.

Enhancing multi-agency collaborations

Initial effort was made to meet this objective through information dissemination. AQD has published/disseminated the Program objectives, activities and milestones in SEAFDEC's 'Fish for the People' Magazine to inform Member Countries on technology adoption methods, modalities and pathways experienced in various project sites in the Philippines.

Other R&D Activities

Institutional Capacity Development on Sustainable Aquaculture (ICDSA) and other Collaborative Projects

The ICDSA which is being implemented in partnerships with the local government unit, donor communities, fisherfolks/farmers and other stakeholder groups provides a mechanism for the assessment of socioeconomic and environmental impacts of AQD aquaculture technologies and, for building the capacity of beneficiary communities.

The Phase two of the Community-based milkfish cage culture project involving fisherfolk organizations in Nueva Valencia, Guimaras funded by Petron Foundation was completed. A proposal for the third phase which entails the establishment of mini-mariculture parks for family based milkfish cage culture enterprise was also prepared. On the other hand, exploratory meetings were held for other projects including an abalone culture project in Palawan; grouper and abalone culture in Romblon; abalone and tilapia culture as well as community-based fisheries resources management in Albay; and an aquaculture livelihood project in Masbate.

With regard to collaborative projects with BFAR, SEAFDEC/AQD renders technical assistance in the construction of multi-species marine fish hatcheries in different parts of the country (*e.g.* in Baler, Aurora; Sta. Lucia, Palawan; Bongabong, Oriental Mindoro; Sta. Cruz, Davao; Sagnay, Camarines Sur and Laoang, Samar). SEAFDEC/AQD also provides technical assistance for the operation of the hatcheries that are already operational (Baler, Aurora; Sta. Lucia, Palawan; Bongabong, Oriental Mindoro). SEAFDEC/AQD is also in consultation with BFAR on how AQD can assist BFAR in the implementation of their national programs on aquasilviculture and community-based multi-species hatchery.

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 postproduction.

From January to September 2012, the ABOT AquaNegosyo Program has responded to 37 clients (24 from Philippines and 13 from other countries). Top commodities inquired are freshwater fish and prawn, high value fish, mud crab and abalone. Three international clients have already signed formal agreements with AQD.

Training and Information

SEAFDEC/AQD has continued to demonstrate its significant contributions to aquaculture development in the region through building institutional capacities and developing a critical mass of experts on aquaculture technologies. Over 200 international and local training courses have been conducted from 2002 to present and nearly 3,000 participants from various stakeholder groups from SEAFDEC/ASEAN Member Countries and other interested countries have been trained. Philippines, being the host country to AQD, had the most number of participants followed by Myanmar. Overall, AQD's capacity building programs have produced a large number of technical personnel who are now in the aquaculture business themselves or conduct or 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.

To enhance visibility locally and internationally and disseminate viable technologies, AQD has published over 200 scientific papers (from 2005-2012), of which more than half are from



internationally peer reviewed scientific journals (ISI-CC covered journals). In 2012 (January to September), apart from 10 scientific papers published in ISI-CC covered journals, the Department also produced/disseminated two new manuals, seven institutional flyers and other information materials about AQD. Significant efforts were also made in upgrading and updating the AQD's website.

PLANS IN 2013

To meet the objectives of the thematic Programs and fast track AQD's overall development goal, AQD will continue most of the studies/projects in 2012 as well as implement new studies (see Annex 2C). This will also include putting in high 'gear' the activities that will ensure adoption and uptake of AQD's viable aquaculture technologies by its targeted clients.

LIST OF PROJECTS

Projects Implemented in 2012:

- 1) Meeting social and economic challenges in aquaculture;
- 2) Quality seed for sustainable aquaculture;
- 3) Healthy and wholesome aquaculture;
- 4) Maintaining environmental integrity through responsible aquaculture; and
- 5) Adapting to climate change impacts

Projects proposal for 2013:

- 1) Meeting social and economic challenges in aquaculture;
- 2) Quality seed for sustainable aquaculture;
- 3) Healthy and wholesome aquaculture;
- 4) Maintaining environmental integrity through responsible aquaculture; and
- 5) Adapting to climate change impacts

PROJECT DOCUMENT

Program Category: Departmental Program
Project Title: Adapting to Climate Change
Responsible Department: Aquaculture Department
Total Duration: 2012-2016

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 Objectives

The overall goal of the program is to identify the accompanying changes in the environment brought about by the changing climate that may affect the aquaculture sector, prepare the sector to the possible effects that these changes may have on aquaculture operations, minimize and mitigate the adverse impact(s) of climate change in aquaculture, and ensure the continued operation of all aquaculture production systems under changing climatic conditions.

The specific objectives are to:

- 1) Gather scientific information on the susceptibilities of various aquaculture species to the combined effects of increasing seawater temperature and acidity;
- 2) Gather scientific data on the effects of climate change to production of natural live food organisms for hatcheries and for pond culture systems;
- 3) Promote public awareness on the possible effects of climate change to aquaculture activities and to the fish farmers;
- 4) Assist other government agencies in the country and in the region in gathering baseline information on aquaculture areas/sites that are vulnerable to climate change effects;
- 5) Gather scientific information that will serve as basis for the formulation/design of alternative aquaculture systems that are adaptive to climate change;
- 6) Collaborate with other institutions in the country and in the region in gathering baseline information on the effects of climate change to mangrove and coral reef ecosystems; and
- 7) Explore potential adaptive measures to mitigate the impact(s) of climate change to the different aquatic farming systems.

2.2 Project Description

Activities of the program focus on addressing 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, important data on this aspect will be generated to serve as basis for the mitigation measures that will be provided. Improvements and innovations on the different aquaculture holding systems and structures are also necessary in order to lessen and/or reduce the impact to fish supply production. How climate change affects important related ecosystems like the mangrove and coral reef ecosystems will be ascertained as well.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

a) *Generate scientific information on the effects of increasing temperature on the reproductive performance of important aquaculture fishes- Rabbitfish*

Very little information is known on how gonadal maturation and spawning in tropical aquaculture fishes is affected by elevated temperature. This was investigated in rabbitfish, *Siganus guttatus*. Three groups of rabbitfish breeders (n=80/group, sex ratio of 1:1) were separately stocked in concrete tanks. For the first 3 months, water supply was at ambient temperature (27-29°C) and gonadal development and spawning performance of the breeders were monitored every month. Starting on the 4th month, the water temperature was increased to 31°C and 33°C in the 2 groups and gonadal development and spawning performance were continuously monitored monthly. As expected, gonadal development and spawning performance of the 3 groups when at ambient temperature were high. When the temperature was increased, gonadal development and spawning were very much affected in the groups supplied with 33°C water. Most females had oocytes that were atretic. During 7 months of exposure, spawning was observed only on 2 occasions and in both times, the spawned eggs did not hatch. The gonadal development and spawning performance of breeders in 31°C were not much affected. Clearly, spawning of rabbitfish breeders is affected when exposed to temperature of 33°C.

b) *Generate scientific information on the effects of increasing temperature on embryonic and early larval development of important aquaculture commodities*

Marine fishes - milkfish, rabbitfish, Asian sea bass:

The effect of elevated water temperature on embryonic development of important marine fishes was investigated in milkfish, rabbitfish and the Asian sea bass. Embryonic development success and hatching rate were always high when embryos were incubated in ambient temperature of 28-29°C. Embryonic development was aborted in all 3 species when fertilized eggs were incubated at 33°C. Although embryonic development proceeded normally in embryos incubated in 31°C, hatching rate was lower compared with those incubated in ambient temperature (Fig. 1).

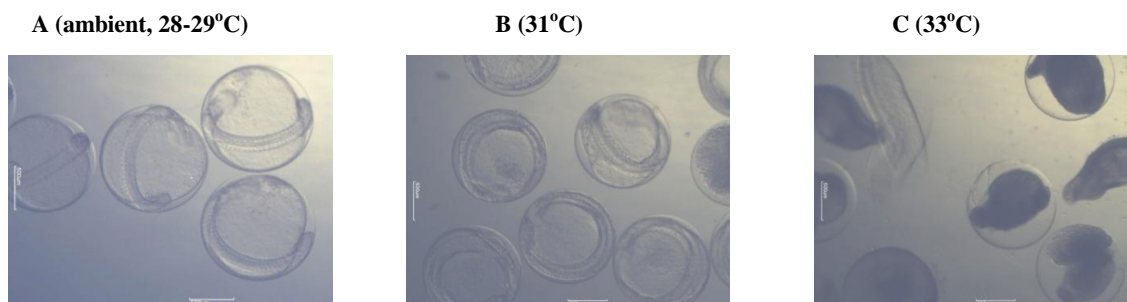


Figure 1. Embryonic development proceeded normally at ambient temperature (A) and at 31°C (B). Embryonic development was aborted when embryos were incubated at 33°C and no hatching took place (C). Hatching rate of milkfish embryos was best (>80%) when incubation was done in ambient temperature

Crustacean and molluscs – mud crab and abalone:

Mud crab zoea 1 survived very well in 31°C. The older stages, zoea 3 and zoea 4, prefer ambient temperature. Lowest survival was observed in zoea larvae reared in 33°C.

For abalone larvae, elevated temperature (33°C) had no significant effect on settlement rate and survival. Highest settlement rate and survival was even observed in larvae at 31°C.

c) *Generate scientific information on the effects of increasing temperature, pH and salinity on reproduction and growth of natural food organisms used in fish hatcheries.*

In a multi-factorial experiment, the interactive effects of temperature (29, 30, 31°C), pH (7.5, 7.8, 8.0) and salinity (20, 30, 38 ppt) were examined in rotifers, an important zooplankton that is commonly used in fish hatcheries. Population growth was significantly higher in 33°C and 20 ppt, and lower in pH 7.5. No interactive effects were observed. The size of the rotifers was also not significantly different among treatments. Likewise, no abnormality in swimming behavior and morphology was observed. These initial data indicate that rotifers may tolerate the unfavorable conditions that are predicted to happen in the future due to climate change.

Major program activity	Duration	Remarks
<p><i>Generate scientific information on the effects of increasing temperature on the reproductive performance of important aquaculture fishes</i></p> <ul style="list-style-type: none"> • Reproductive performance of rabbitfish <p><i>Generate scientific information on the effects of increasing temperature on the embryonic and early larval development of important aquaculture commodities</i></p> <p>Marine fishes</p> <ul style="list-style-type: none"> • Milkfish • Rabbitfish • Asian sea bass <p>Crustaceans</p> <ul style="list-style-type: none"> • Mud crab <p>Mollusks</p> <ul style="list-style-type: none"> • Abalone <p><i>Generate scientific information on the effects of increasing temperature, pH and salinity on reproduction and growth of natural food organisms used in fish hatcheries</i></p> <p>Zooplankton</p> <ul style="list-style-type: none"> • Rotifers 	<p>2012</p> <p>2012</p> <p>2012</p> <p>2012</p>	<p>Mature rabbitfish will not spawn at temperature of 33°C.</p> <p>Embryonic development is significantly affected at 33°C. Larval development is significantly affected in both 31 and 33°C. Asian sea bass survives better compared to milkfish and rabbitfish.</p> <p>Lowest survival of crab zoea stage 2-5 was observed in 33°C.</p> <p>There was no significant effect of elevated temperature on the settlement and survival of abalone larvae.</p> <p>Population growth is significantly higher at 33°C</p>

		and 20 ppt, and lower at pH 7.5. No abnormality in swimming behavior or morphology was observed.
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4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Major program activity	Duration	Remarks
<i>Generate scientific information on the effects of increasing temperature on the reproductive performance of important aquaculture commodities</i>		
Marine fishes • Rabbitfish	2013	The experiment will be conducted until the first half of 2013.
• Milkfish	2013-2014	This will be conducted when funds from DOST for the purchase of heaters become available.
Crustaceans • Giant freshwater prawn	2013-2015	Effect of increasing temperature and pH on maturation and spawning will be done.
Mollusks • Abalone	2013-2015	Spawning performance of abalone in 31°C will be monitored.
<i>Generate scientific information on the effects of increasing temperature on the embryonic and early larval development of important aquaculture commodities</i>		
Marine fishes • Rabbitfish/Asian sea bass	2013	Two more runs for embryos will be conducted.
• Groupers/Red snapper/Pompano	2013-2014	This will be conducted towards the later part of 2013.
Crustaceans • Mud crab	2013	The effect(s) of elevated temperatures on other stages of larval development will be tested.
• Giant freshwater prawn	2013-2015	
Mollusks • Abalone		
<i>Generate scientific information on the effects of increasing temperature on growth, survival and reproduction in seaweeds</i>	2013-2014	Other stages of larval development will be done. The effects of increasing temp/pH on growth/survival and spore shedding of <i>Kappaphycus</i> will be done.

Major program activity	Duration	Remarks
<i>Generate scientific information on the effects of increasing temperature on the susceptibility to diseases of fish, shrimp and seaweeds</i>	2013-2015	The effects of elevated temp on susceptibility to diseases of fish (<i>S. iniae</i> in tilapia; VNN in grouper & milkfish), shrimp (luminous bacteria and WSSV) and seaweeds (ice-ice and epiphytes) will be done.
<i>Generate field data on the relationship of environmental parameters on seaweed production and occurrence of diseases</i>	2013-2016	To determine the relationship of environmental changes on seaweed production. Seaweed farms will be monitored for at least a year to obtain correlation between data on water parameters and seaweed production.
<i>Generate scientific information on the effects of increasing temperature, pH and salinity on reproduction and growth of natural food organisms used in fish hatcheries</i>	2013-2014	The experiments on rotifers will be continued during the first half of 2013. The experiments on rotifers will also be done with copepods.
Zooplankton • Rotifers • Copepods	2013 2013-1014	

4.2 Expected Outputs

For each program activity, the following are the expected outputs:

1. *Generate scientific information on the effects of increasing temperature on the reproductive performance of important aquaculture commodities.*
 - Reproductive performance of rabbitfish in elevated water temperature will be determined;
 - Reproductive performance of milkfish in water temperatures of 31°C and 33°C will be known;
 - Effect of increasing temperature and pH on maturation and spawning in giant freshwater prawn will be determined; and
 - Spawning performance of abalone in 31°C will be determined.
2. *Generate scientific information on the effects of increasing temperature on the embryonic and early larval development of important aquaculture commodities.*
 - More data on the influence of elevated temperature on rabbitfish and Asian sea bass embryonic development will be generated;
 - Developmental success and survival of embryos of groupers, red snapper and pompano at elevated water temperature of up to 33°C will be known;
 - Other larval stages of mud crab will be tested as to its ability to survive elevated water temperature;
 - The ability of the different stages of giant freshwater prawn larvae to survive elevated water temperature will be established; and
 - The ability of the other stages of abalone larvae to survive elevated water temperature will be established.
3. *Generate scientific information on the effects of increasing temperature on growth, survival and reproduction in seaweeds.*
 - Whether growth, survival and spore shedding of *Kappaphycus* will be affected by elevated water temperature (33°C) and acidic water pH will be known.



4. *Generate scientific information on the effects of increasing temperature on the susceptibility to diseases of fish, shrimp and seaweeds.*
 - Whether elevated water temperature (33°C) will influence the susceptibility to diseases of fishes like tilapia (*S. iniae*), grouper & milkfish (VNN), shrimp (luminous bacteria and WSSV) and seaweeds (ice-ice and epiphytes).
5. *Generate field data on the relationship of environmental parameters on seaweed production and occurrence of diseases.*
 - Data on the relationship/correlation between changes in environmental parameters to seaweed production and occurrence of diseases in seaweed farms will be generated.
6. *Generate scientific information on the effects of increasing temperature, pH and salinity on reproduction and growth of natural food organisms used in fish hatcheries*
 - Data on whether growth, reproduction, survival and nutritional composition of rotifers and other zooplankton (copepods) commonly used in fish hatcheries will be affected by elevated water temperature and increased acidity of the water will be generated.

PROJECT DOCUMENT

Program Category:	Departmental Programs
Project Title:	Healthy and Wholesome Aquaculture
Responsible Department:	Aquaculture Department
Total Duration:	2012-2016

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) Develop marker-assisted breeding programs to address disease issues
- 5) Re-educate stakeholders and develop the capability of fish health specialists on fish disease diagnosis using gross clinical examination and bacteriology, mycology, parasitology, and histopathology techniques
- 6) Enhance the stakeholders and fish health specialists' understanding and interpretation of molecular diagnostic techniques and to develop healthy broodstocks through pathogen exclusion
- 7) Promote group implementation of BMP/GAP and certification of small-scale farmers in the region and incorporate FAO Technical guidelines to aquaculture certification into national aquaculture certification schemes and development of regional standards as well as promotion of global standard for responsible supply certification system.
- 8) Find different sources of fish meal substitutes and develop effective feed management schemes that incorporate sound management
- 9) Develop aquafeeds for selected species at specific growth stages especially for species or stages for which no artificial feed has been formulated
- 10) 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. 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 nutrition 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 2012

Development of probiotics for the larval rearing of Penaeus spp.

The total polyhydroxybutyrate (PHB) production from spore-forming microbial communities (MC) isolated from different sources was determined. Highest producer was from a pond source and lowest from a marine source. Distinct (61.22%) increase in PHB production and % accumulation by MC subjected to enrichment cycles was observed. Seventy (70) isolates were obtained from MC based on morphological differences of the colonies. Qualitative screening of the isolates by Sudan Black staining was able to identify 3 isolates with highest PHB production and accumulation of 7.6 mg and 22%, respectively.

Application and mode of action of polyhydroxybutyrate (PHB) in the larval rearing of Penaeus spp.

Preparations have been made to start the experiment that will examine the effect of PHB supplementation on the different development stages of *Penaeus* sp. as well as the combined effect of PHB supplementation on the larviculture of *Penaeus* sp. Beneficial effects expected from PHB supplementation include protection from pathogenic infections, growth enhancement, and improved larval survival.

Epidemiology, toxicology, and other etiologies of the early mortality syndrome

Preliminary proposal has been prepared for implementation of the study in 2013. This study has a high priority in view of the region-wide occurrence of EMS in SEA. This topic has been the subject of emergency consultation meetings organized by NACA recently. However, as has been shown by experience in other countries, this problem should be tackled through a multidisciplinary approach as the etiology of the disease (whether infectious or non-infectious) has not been identified, yet.

Polychaetes as carriers of viral pathogens

Polychaetes were collected from 3 sites in Iloilo and two sites in Negros Occidental. For July and August 34-50 worms from each location were pooled as one sample and processed for WSSV detection by PCR. For both months, worms from the five sites were all negative for WSSV.

Surveillance of zoonotic bacteria and parasites from cultured organisms

New proposed study. This study will obtain baseline information on the zoonotic bacteria and parasites from cultured freshwater and marine organisms and their rearing environments.

Antimicrobial screening of red seaweeds

Various aqueous and organic extract preparations from ten varieties of *Kappaphycus* and *Eucheuma* species have been screened for antimicrobial activities to date. Promising activity against *S. aureus* and MRSA was observed in crude organic extracts of the Vanguard variety (>7 mm zone of inhibition), and very low activity against *E. coli* was observed for the crude organic extracts of *Gracilaria* and Vanguard varieties (~2 mm zone of inhibition). Preliminary antiviral screening using commercial carageenan showed that pre-treatment with 0.5 or 1% carageenan 30 min pre-inoculation with SVCV apparently reduced viral plaques but no significant reduction was observed when co-incubated or post-treated (30 min post SVCV inoculation) with carageenan. Two crude carageenan preparations have been prepared from two varieties of *K. alvarezii* but none have been tested for antimicrobial activity yet.

Bacterial diversity and algal community in biofilms of settlement plates for abalone larvae

The bacterial and algal community profile of the biofilms of settlement plates for abalone larvae is being monitored. Determination of successful/failed runs is still on-going. For past 2 years, data were obtained only from successful runs and thus, this year, data gathering is targeted on failed runs to fully characterize microbial community (both bacterial and algal populations) from both successful and failure rearing runs of abalone larvae. However for the past months, rearing runs were successful. Thus, no sampling and monitoring of rearing plates were done yet for failure runs.

Withdrawal periods of antibiotics in fish species cultured in the tropics

Regular and medicated feeds were prepared in the Feed Mill unit. OTC-mixed diet is 4.54 g OTC/kg feed ingredients while OXA-mixed is diet 1.5g OXA/kg of feed ingredients. SEAFDEC formulation for snapper juveniles was used for the feed mix.

Experimental set-up was already finished and all samples were retrieved. Experiment protocol was as follows: 18 pcs of 250L cap fiber glass tanks with flow thru water system; 3 treatments OTC, OXA and Control using 6 tanks per treatment; 13pcs. fish / tank were given daily feed ration of 2% body weight with drug dosage of 75mg/kg fish/day OTC and 30 mg/kg fish/day OXA; medicated diet was given for 10 days and 45 days was allotted for the drugs to deplete from the fish body; Ave. temperature during the entire experiment was $27.7 \pm 0.77^{\circ}\text{C}$.

Eighty five per cent of samples for the evaluation of OTC withdrawal and 27% for OTC accumulation pattern have been extracted and injected in HPLC. Blood samples were all ready for HPLC injection. For OXA samples, partial extraction of the drug from the muscles was already started.

Hands on training on conventional and advanced diagnostic methods

To promote a holistic approach of disease diagnosis, a training course on conventional and advanced diagnostic methods for local and international participants (fish farmers and fish health specialists) will be conducted.

Host response to pathogens and development of control methods including use of natural immunostimulants for marine fishes

Parasites were isolated from a natural outbreak and maintained by serial passage in live fish. LD_{50} was determined using tomonts/L of water as the unit of infection. The 10-day LD_{50} corresponded to 48 tomonts/L. Experimental transmission showed a progressive decline in parasite density colonizing the skin and gill surfaces with each transmission cycle. Eventually, no mortalities occurred in the succeeding inoculations due to the low number of trophonts able to infect the fish. Surviving hosts were subsequently found to be free from parasites. Assessment of immune parameters and expression of antimicrobial peptides upon exposure to infective dinospores and trophonts is ongoing.

Development of immunostimulants vaccines and establishment of disease challenge protocols for selective breeding of shrimps and crabs

New proposed study. Domestication and selective breeding of important crustaceans such as shrimps and crabs are being done to select for quantitative traits such as fast growth and resistance to diseases. However, inconsistent broodstock quality and the absence of validated methods to determine fitness and disease resistance have been identified as among the major constraints. A proposal has been prepared and will be implemented to address this problem

Fertilization techniques for improving growth and carrageenan quality, and reducing disease prevalence in seaweeds

Continuing study. Preliminary data showed that certain fertilization schemes could improve growth and quality of carrageenan as well as reduce the occurrence of "ice ice" disease affecting farmed seaweeds.



Use of soybean meal and soy protein concentrate in milkfish diet

The first experiment for 2012 on optimizing the SEAFDEC-USB milkfish diet with the optimum levels of fish meal, soybean meal, and soybean concentrate and using phased feeding from starter, grower, and finisher stages is on-going. The juvenile milkfish (average body weight=40g) were stocked (20/m³) in floating bamboo net cages at the SEAFDEC Igang Marine Station. Fish are fed either AQD formulated diet (SEAFDEC-USB) or commercial floater diet at 6-4% of body weight thrice daily at 0800, 1200, and 1600 H. After 105 days of culture, the fish fed the AQD formulated diet had better growth (average body weight-1050g) than those fed the commercial diet (548g). Survival rate was 97% in stocks fed either the AQD formulated diet or commercial diet.

Use of varying levels of copra meal in mudcrab diet

Three successive runs were aborted due to non-successful molting of the mud crab after 90 days. The present run of the feeding experiment consisting of six isoproteic (40% CP) and iso-energetic diets were formulated where fishmeal was replaced by 35% SBM, and copra meal protein replaced SBM at 0, 10, 20, 30, 40, and 50% level. To date, the different treatments are not showing significant differences in terms of survival, body weight and molting interval.

Production characteristics of the giant freshwater prawn cultured in cages using different grow-out management strategies: feed management strategies and periphyton-based production

Juvenile *M. rosenbergii* with mean weight of 2.46±0.61g were stocked in hapa net cages 2 x 2 x 1m at a stocking density of 15 pcs/m². Treatments consisted of different total effective substrate area expressed as percentage of cage bottom as follows: 0, 40, 80, and 120% with 4 replicates/treatment. Prawns relied solely on natural food. After 1 month of sampling, no significant differences in the various growth parameters were observed among treatments.

Another experiment was conducted to determine stocking densities of *M. rosenbergii* which can be supported solely by periphyton productivity in cage culture. Juveniles of *M. rosenbergii* were reared in 2 x 2 x 1m hapa net cages in BFS facilities and stocked at 5, 10, and 15 prawns/m². After six months, significantly higher mean weight, daily growth rate and specific growth rates were observed at the lowest stocking density (5pcs/m²) compared to the other two treatments. No significant effects on survival were observed. Analysis of periphyton and natural food biomass for six months of culture showed no significant differences among the different stocking densities.

Feed development for the golden pompano

Nine test diets were formulated using practical feed ingredients. Protein levels were 54, 46 and 38% and for each protein level there were 3 lipid levels at 8, 11 and 14%. Feeding experiment was conducted for 14 weeks using pompano fry (1.6g) stocked in tanks. Liver samples of fish were dissected for histology while hematocrit levels of fish from all treatments were measured. Results showed that after 14 weeks of feeding on different dietary treatments, survival rates of pompano were almost 100%. Final average weights ranged from 30-58g. The FCR, SGR, and % weight gain of fish on diets containing 46 and 54% were significantly better than those fish fed 38% CP regardless of lipid level (8, 11, or 14%). Estimated P/E ratio of the nine test diets ranged from 102 to 145.7 mg protein/kcal. The sparing protein effect on protein by CHO was noted at higher protein levels.

Intensive milkfish culture in brackishwater ponds using alternate day feeding

Milkfish fingerlings were stocked in two ponds fed daily or on alternate days. Fish were stocked at a density of 0.64 pc/m² in fish fed on alternate days (initial wt=103g) at a total biomass of 501.1 kg at 90% survival. In fish fed daily, initial weight was 230g with a total biomass of 1117.8 kg at 90% survival. After 45 days of feeding of fish fed on alternate days, average body weight was 164g. On the other hand, average body weight of 293.4 g was noted after 15 days.

Demonstration of semi-intensive grow-out culture of pompano in brackishwater ponds using commercial diet

Pompano post-juveniles with initial average body weight (ABW) of 163g and average total length (ATL) of 18.3 cm were stocked at a density of 5000/ha in 0.844 ha pond and fed commercial grow-out diet. After 60 days of culture, pompano had ABW of 318.5g and ATL of 25.9 cm.

Intensive grow-out culture of mangrove red snapper in brackishwater ponds using SEAFDEC formulated diets

Ten thousand pieces of mangrove red snapper fingerlings (1in long and VNN-negative) from the SEAFDEC Finfish hatchery were stocked in ponds. They were stocked in 5 units of 3x 3 x 1 m net cage in the ponds for the nursery operation. Nets were changed every week with fish subjected to freshwater bath to eliminate parasites. Maintenance feeding is done 3x daily. Fish will be moved to the grow-out ponds upon reaching the desired size.

Netcage culture of tilapia and freshwater prawn in freshwater dam/reservoir using commercial and SEAFDEC/AQD feed

The study was undertaken in a freshwater reservoir at Brgy. Camambugan, Dingle, Iloilo using 6 units of 5 x 5 x 2.5 m stationary net cages stocked at 15/m³ each of tilapia and giant freshwater prawn fed artificial diet. Two runs conducted showed that the growth, survival, and feed conversion ratio (FCR) were better in both tilapia and freshwater prawn fed the SEAFDEC AQD formulated diet compared with those fed the commercial feed. Cost and return analysis showed that the SEAFDEC AQD diet performed better than the commercial feed in terms of combined final biomass and net income. The return on investment using the diet was 40.5% and payback period of 1.4 years.

The same study will be tested on a semi-commercial scale in the freshwater reservoir/dams of 2 Barangays in Dingle and Concepcion in Iloilo. In both demonstration sites, construction, fabrication, and installation of net cages are now being started. Tilapia and ulang seeds from the hatchery of SEAFDECAQD in Tigbauan Main Station and Binangonan Freshwater Station will be stocked as soon as net cages are ready.

Economics of mudcrab juveniles for soft-shell crab farming

The first run of the study was completed after 72 days of culture. The survival rate was 17%. Of the 322 crabs harvested, 64%, had average body weight of ≤79 g followed by 22% of 80-110 g and 13% of ≥111g.

Fifty crabs (5.25 kg) were used for the soft-shell crab farming trial. The crabs were placed individually in perforated plastic boxes and fed until they underwent molting. About 36% mortality was noted due to harvest and handling stress and escape of some crabs from the boxes. The soft shell crabs were sold while the hard shell crabs were used for the selective breeding study.

Major program activities	Duration	Remarks
Fish Health		
1. Development of probiotics for the larval rearing of <i>Penaeus</i>	2012 – 2015	The study is continuing until 2015
2. Application and mode of action of Polyhydroxybutyrate in the larval rearing of <i>Penaeus</i> sp.	2012 – 2015	PHB alone and PHB + lipid are being compared feeding experiments
3. Epidemiology, toxicology and other etiologies of Early Mortality Syndrome (EMS)	2013 – 2014	The study will continue until 2014 to determine if EMS occurs in the

4. Polychaetes as carriers of viral pathogens	2012 – 2013	Philippines and what causes it. The study is continuing until 2013;
5. Surveillance of zoonotic bacteria and parasites from cultures organisms	2013-2014	Proposed study
6. Antimicrobial Screening of Red Seaweeds	2012 – 2013	Continuing until 2015. Several extracts tested for antibacterial and antiviral activity.
7. Bacterial diversity and algal communities of biofilms in settlement plates for abalone larvae	2013 – 2014	Continuing until 2014. Continue monitoring of settlement plates for unsuccessful hatchery runs
8. Withdrawal period of antibiotics in fish species cultured in the tropics	2012 – 2014	Continuing study
9. Surveillance of freshwater prawn diseases	2013 – 2014	Proposed study
10. Training on Conventional and Advanced Diagnosis	2013 – 2014	Capability-building to enable accurate diagnosis
11. Host response and development of control methods including use of natural immunostimulants and vaccines	2013 – 2014	Continuing; amyloodinium stock needs replacement
12. Development of bacterial and viral vaccines for freshwater and marine organisms	2013 – 2014	New proposed study. Application of nanoparticles for delivery.
13. Development of immunostimulants and vaccines and establishment of challenge protocol for selective breeding of shrimps and crabs	2013-2014	New proposed study
Nutrition and Feed Development		
14. Use of soybean meal and soy protein concentrate as alternative to fish meal in milkfish diets	2012 – 2014	The study is continuing until 2014
15. Improvement of nutritional value of locally available feed resources for practical aquafeeds by submerged fermentation and solid-substrate fermentation using milkfish gut bacteria and/or selected fungi	2012 – 2014	Scale-up of fermentation is on-going to collect fermented ingredients for the feeding experiments
16. Copra Meal as replacement to SBM in mudcrab diet	2012 – 2013	The study will continue until 2013 to test other digestible ingredients as

<p>17. Production characteristics of the giant freshwater prawn cultured in cages using different grow-out management strategies: feed management strategies and periphyton-based production</p>	<p>2012 – 2015</p>	<p>replacement to fish meal The study is continuing until 2015; Proximate analysis of the dried samples periphyton collected from inside the cages is still to be done.</p>
<p>18. Feed development for the golden pompano</p>	<p>2012 – 2014</p>	<p>Second feeding experiment for the test of diets is now being prepared.</p>
<p>19. Refinement of abalone grow-out diet</p>	<p>2013 – 2014</p>	<p>Proposal will be prepared this 2013 to refine the existing abalone feed formulation for the grow-out abalone.</p>
<p>20. Intensive Milkfish culture in brackishwater ponds using alternate day feeding</p>	<p>2012 – 2014</p>	<p>The study will continue pending rehabilitation of ponds.</p>
<p>21. Demonstration of semi-intensive grow-out culture of pompano in brackishwater ponds using commercial diet</p>	<p>2013 – 2014</p>	<p>The study was deferred subject to completion of the SEAFDEC-AQD diet for Pompano.</p>
<p>22. Intensive grow-out culture of mangrove red snapper in brackishwater ponds using SEAFDEC formulated diet</p>	<p>2013 – 2014</p>	<p>Fish will be moved to the grow-out ponds when the desired fish size is attained.</p>
<p>23. Refinement and demonstration of semi-intensive grow-out culture of grouper of grouper in BW ponds fed SEAFDEC-Formulated diets</p>	<p>2013 – 2014</p>	<p>The project will be started after the ponds are rehabilitated and grouper juveniles become available.</p>
<p>24. Netcage culture of tilapia and freshwater prawn in freshwater dam/reservoir using SEAFDEC AQD and commercial feed</p>	<p>2013 – 2014</p>	<p>The project is about to be tested in a semi-commercial scale in 2 freshwater dams in Dingle and Concepcion, Iloilo.</p>

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1. Planning of the Project Activities

Since the activities of the program have just been started in 2012, these will continue as scheduled until next year, 2013/2014 (please see also the remarks given per study as indicated above)



4.2. Expected Outputs

- 1) Specific *Bacillus* strain identified and tested for larval rearing;
- 2) Identified appropriate level of PHB supplementation in shrimp diet, increased survival of 40% over the unsupplemented diet;
- 3) Identified causative agent for the EMS including ways to prevent or control disease occurrence/outbreak;
- 4) At least 3 sampling sites from each region; identified zoonotic bacteria (ZB) and parasites (ZP); antibiogram of ZB;
- 5) Prevalence of wssv and other viral pathogens in polychaetes; vector-based control method; protocols to produce WSSV-free polychaetes;
- 6) Feeding management for milkfish and other species improved;
- 7) Completion of in vitro studies, identified red seaweed species with antimicrobial properties, screening extracts from 25 samples;
- 8) Netcage culture of tilapia and freshwater prawn in semi-commercial scale demonstrated;
- 9) Identified and quantified bacterial and algal communities on settlement and rearing plates; potential pathogens and beneficial components of the biofilm;
- 10) Withdrawal period of two antibiotics (OTC and OXA) in grouper;
- 11) Baseline data on diseases of freshwater prawn;
- 12) Increased survival to 40% over the control in challenge experiments;
- 13) Field tested efficacious immunostimulants and vaccines;
- 14) Fertilization techniques for seaweeds developed;
- 15) Different fish meal substitutes for various SEAFDEC/AQD formulated diets identified;
- 16) Effective feeding management schemes that may incorporate sound environmental management developed;
- 17) Efficient grow-out diet for pompano developed;
- 18) Efficient grow-out diet for abalone refined and verified;
- 19) Grow-out culture of grouper in brackishwater ponds with practical feed demonstrated;
- 20) Feeding management for milkfish and other species improved;
- 21) Conduct of Aqua-Nutrition On-line Course and Publication of Manuals;
- 22) Netcage culture of tilapia and freshwater prawn in semi-commercial scale demonstrated; and
- 23) Economics of producing mudcrab juveniles for soft-shell crab farming identified.

PROJECT DOCUMENT

Program Category:	Departmental Program
Project Title:	Maintaining Environmental Integrity through Responsible Aquaculture
Responsible Department:	Aquaculture Department
Total Duration:	2012-2016

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 and more. Particulate organic waste from fecal materials and uneaten food in intensive aquaculture production has 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 Objectives

Develop environment-based aquaculture technology by integrating environmental factors in SEAFDEC/AQD research activities and to maintain environmental integrity by promoting responsible aquaculture practices. The specific objectives are:

- 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 Project Description

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 OF ACTIVITIES IN THE YEAR 2012

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*

The bathymetric survey of Igang Bay has been completed. The deepest areas identified at 70m were at a distance of 1000m from the shore. Through the survey, three important levels were identified: (a) areas exposed when tide level is at 0m; (b) areas which have the minimum required depth for fish cages, with 6 m level and (c) areas recommended for cage cooperation because the depth is 10m. The mapping of seagrass beds and coral areas in the same site were also done and confirmatory dives will be completed by the end of the year. Water quality for Igang Marine Station was also monitored. For the cage culture site of the Binangonan Freshwater Station, water quality monitoring was conducted in conjunction with the on-going experiments in the area.

The assessment and documentation of species in and around the marine cages and adjoining habitats at Igang Marine Station has been done and is expected to be completed at the end of the year. Thus far more than 500 species from more than 200 families and 13 major taxa have been collected and photographed for cataloguing. The species in the different types of habitat were characterized. Different species combination was found in seagrass beds, rocky bases of islands and in cages and drums of the floating cages. A positive effect of aquaculture on biodiversity was noted in terms of additional species attached to the cages and drums.

b) *Identify appropriate extractive species that may be used in IMTA*

Various extractive species are being investigated. Among them the sandfish *Holothuria scabra*, the bivalve mollusk *Anodontia philippiana* and the seaweed *Gracillaria bailinae*. The co-culture of these extractive species with other commercially important commodities is being investigated.

Studies on the sandfish, *Holothuria scabra*, in polyculture with other marine species is on-going. A production run in pens at Igang Marine Station (IMS) has been completed with milkfish (*Chanos chanos*) as the marine fish species. The growth and survival of the milkfish was good, however the growth and survival of the sandfish was not good with some pens having no survivors by the end of the run. A number of crabs, large shrimp and a few siganids were found in the pens which may have picked at the sea cucumbers until they eviscerated and died. Also, all surviving sea cucumbers had lesions on their ventral surface by the end of the experiment – they may have been injured by the roughness of the b-net used for the construction of the pens. A production run has been initiated at IMS with pompano (*Trachinotus blochii*) as the finfish species. Based on the results of the milkfish run, the pen bottoms were lined with a fine mesh hapa net before stocking. This was done in an attempt to lessen the injury from the rough net, and to retain more excess feed and fish waste for the sea cucumbers to feed on. Though not yet completed, this run shows much faster growth of the sea cucumbers. A production run similar to the one in IMS is underway, but this time in pens in pond.

The co-culture of seaweed *Gracillaria bailinae* with seabass is also being investigated. The nutrient production of seabass has been determined with total nitrogen (TN) production as 0.11-0.57 mg/L and total phosphate (TP) as 0.01-0.67 mg/L. An experiment to determine production of seabass in monoculture and in co-culture with seaweed started in September with seabass stocked at 1pc/m² and seaweed at 1kg/m².

The bivalve mollusk *Anodontia philippiana* (AP) is known to assimilate sulfide. Together with *Gracillaria bailinae* (GB), the species to reduce sulfide and nutrient levels, respectively, in milkfish (MF) ponds is being investigated. Ponds were stocked with MF alone, or in various combinations with AP and GB (MF+AP, MF+GB, MF+AP+GB). The highest phosphate levels of 0.3 ppm was detected in the pond with MF+AP+GB and lowest in pond with MF+AP. No differences in ammonia, nitrite and nitrates were found in all treatments. MF growth rates of 15-90g/month and survival of 50-92% were observed.

c) Develop and promote efficient and suitable environment-friendly culture systems

Laboratory experiments to evaluate culture parameters for optimal growth and survival of sandfish *Holuthiria scabra* has been delayed due to damaged experimental bins. New bins are being procured and as soon as they become available, the experiments will proceed. Sites in Ajuy, Iloilo and in Igang, Nueva Valencia, Guimaras for culture and sea ranching of sandfish have been assessed and small-scale pond and pen culture trials at these sites are on-going. Both sites showed promising results so far with growth rates averaging 0.25 g/d without feeding in the first month. Survival was also high (75-100%) for all replicates. New sites for sandfish ranching are being considered.

Initial assessment of sites for possible pond and pen culture of the sandfish has been conducted. The first site is in Ajuy, Iloilo. The culture of sandfish in ponds, pens and in sea ranching is being studied. Good growth of sandfish reared in cages in both pond and open lagoon area was achieved in initial runs. Pen culture trials are also ongoing at the Ajuy site. Higher growth rates (0.71 g/d) were recorded for the open sea pen, compared with that of inside the pond (0.38 g/d). However, escapes and predation was high in the open cove where no sandfish were observed after 5 weeks. On the other hand, pens in ponds recorded 100% for sandfish stocks. Another experimental pond is also being prepared in Igang, Guimaras. Initial culture experiments in cages showed good average growth rate of 0.57g/d and 96% survival for the 2 month trial culture. Now, a larger scale experiment is being prepared. Other sites in Concepcion, Iloilo and Panobolon Island, Guimaras are also planned to be assessed in October.

The sandfish sea ranching component is still in its assessment and preliminary preparations stage. Initial assessments for sites in Ajuy, Igang in Guimaras and at Pandan, Antique did not show good possibilities. In addition to the sites being considered for pen and cage culture, Pulopinya Island, Concepcion in Iloilo will also be assessed for sea ranching of sandfish.

The carrying capacity of inland water bodies in the Philippines is being modeled using the Cage Aquaculture Decision Support Tool (CADS Tool). The model was initially developed for marine cage systems and is being refined in collaboration with the Department of Primary Industries of New South Wales, University of New South Wales and University Technology Sydney, in Australia through ACIAR funds. An initial trial of the CADS tool has been done for Lake Bato and for some lakes. However, refinement of the model still needs to be done.

d) Conduct biological and ecological studies on species with potentials for resource enhancement

A number of species are being studied for resource enhancement activities. These are the giant clam *Tridacna gigas*, abalone *Haliotis asinina*, and three species of mud crabs *Scylla serrata*, *S. olivacea* and *S. tranquebarica*.

Nursery rearing of clams *Tridacna gigas* conducted in Brgy Cata-an MPA, San Joaquin, Iloilo with growth rate of 9.8 mm/month; some problems with mortalities due to strong waves and typhoon. Restocking sites close to reefs near nursery cages where natural population of wild clams were also observed were identified. Three clam garden sites have been stocked with 28 to 30 clams; five clams (22-25cm SL) were also initially transferred to the MPA of Brgy Lawigan, while some clams are also planned to be transferred to Brgy Sinogbuan. Thirty-one wild clams (mainly *T. squamosa* and *T. maxima* species) have been marked for protection and monitoring in the Cata-an MPA. Current sizes of these wild clams range from 8 – 36 cm SL. Average growth rate of wild clams is about 1 cm/month.

To collect information on mud crab population and fisheries, a new site in Brgy. Rojas was identified late last year for the stock enhancement study on this commodity. From the January 2012, a total of 904 crabs have been collected weighing 113.92 kg. Of the total catch 47.9% were males. Of the females, 83.23% were immature, 8.49% were gravid, 8.07 were mature and only 0.21% were spent. No berried females were observed in the catch. Maximum individual daily yield was 2,030g and maximum CPUE was 1.6 crab/gear/d or 294 g/gear/d. No significant difference in Yield and CPUE between bamboo traps and crab pots was observed. Collection of tissue samples for genetic characterization is on-going.

The growth and survival of released wild and hatchery-bred abalone *H. asinina*, monthly monitoring survey is being conducted. A total of 65 abalone have been collected from all 10 transects. Of these, 98.5 % were wild and 1.5 % wild released recaptures (recaptured-wild). Males comprised 35.38% and 64.62% were females. Transect 4 has the highest percentage (40%) cover of dead branching corals with encrusting algae. This preference of abalone to this type of habitat parallels the findings in previous years showing high positive correlation of abalone number with the transect dominated by dead branching corals with encrusting algae. Abalone may be utilizing coral branches as shelters and encrusting algae as food.

Abalone tissue samples collected from the stock enhancement site in the Sagay Marine Reserve (SMR) were analyzed for genetic variation using mitochondrial DNA sequence and microsatellite marker information. These samples represented abalones found in the SMR three months onwards after the release of hatchery-bred individuals for stock enhancement. Monthly on-site monitoring and sampling have been done. Prior to the analysis of the SMR data, information based on the same parameters for genetic diversity were obtained from the wild and hatchery stocks collected pre- stock enhancement. Preliminary analysis using mtDNA sequence markers revealed a total of 36 haplotypes. Of these, 18 haplotypes were found in the wild stocks, 9 haplotypes in the hatchery stocks and 27 haplotypes in the SMR samples. Results of the analysis of molecular variance showed that 95.88% of the observed haplotype variation was due mostly to differences within stocks rather than between stocks. Wild and hatchery reared stocks can be distinguished using COI and COII markers.

Major program activity	Duration	Remarks
Assess impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems <ul style="list-style-type: none"> Hydrographic profiling of Igang Marine Station 	2012	The hydrography of Igang Bay has been characterized and mapped; recommendations for cage areas have been provided based on these bathymetric maps
<ul style="list-style-type: none"> Biodiversity in the marine habitats and the aquaculture cages and platforms in Igang, Guimaras 	2012	To be completed end of this year. More than 500 species identified and the habitat types in the site characterized; this baseline data will provide information on the impact aquaculture activities being done at the Igang Mariculture Park will have in time and if improved aquaculture practices to be implemented in the area will improve biodiversity
Identify appropriate extractive species that may be used in IMTA <ul style="list-style-type: none"> Polyculture of sea cucumber with selected marine fish species 	2012-2014	Testing various marine fish species in combination with sandfish in ponds and pens in ponds will give an indication of the compatibility of sandfish with various marine fish species. Milkfish and pompano co-culture trials is on-going
<ul style="list-style-type: none"> Co-culture of seabass <i>Lates calcarifer</i> and seaweed <i>Gracilaria bailinae</i> in brackishwater pond 	2012-2014	Co-culture of extractive species such as sea weeds with other species which are given commercial diets such as seabass is profitable, environment friendly and sustainable provided the stocking ratios of the seabass and seaweed is appropriate

<ul style="list-style-type: none"> <i>Anodontia philippiana</i> and <i>Holothuria scabra</i> as bioremediators in an intensive cage culture system 	2012-2013	The capacity of extractive species <i>Anodontia philippiana</i> and <i>Holothuria scabra</i> to reduce sulfide and nutrients, respectively in ponds will be established and appropriate stocking ratios of these extractive species for intensive finfish culture system will be established.
<p>Develop and promote efficient and suitable environment-friendly culture systems</p> <ul style="list-style-type: none"> Determination of optimal conditions for sandfish <i>Holothuria scabra</i> culture 	2012-2016	Important parameters for sandfish culture will be identified; production of sandfish in ponds, pens and sea ranch quantified and protocols established
<ul style="list-style-type: none"> Carrying capacity, decision support tools for freshwater systems in Australia and the Philippines 	2010-2013	Once completed, the range of carrying capacity of various inland water bodies being used for aquaculture will be available which can be used in recommending policies for managing aquaculture activities in these water bodies.
<p>Conduct biological and ecological studies on species with potentials for resource enhancement</p> <ul style="list-style-type: none"> Stock enhancement of giant clam <i>Tridacna</i> species in San Joaquin 	2012	The feasibility of using small marine protected areas (MPA's) for stock enhancement of the giant clam
<ul style="list-style-type: none"> Stock enhancement of mud crabs <i>Scylla</i> spp. in the mangroves in Panay 	2012-2014	Mud crab fisheries and population in the study site have been characterized in preparation for stock enhancement activities
<ul style="list-style-type: none"> Stock enhancement of the abalone <i>Haliotis asinina</i> 	2012-2014	The study has identified habitats with the highest incidence (40%) of abalone surveyed indicating habitat preference of the species- high cover of dead branching corals encrusted with algae
<ul style="list-style-type: none"> Application of molecular genetic markers in the conservation and management of marine genetic resources in Asia 	2012-2013	Selected mitochondrial DNA markers have been identified which can distinguish wild and hatchery reared abalone

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Major program activity	Duration	Remarks
<p>Assess impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems</p> <ul style="list-style-type: none"> Biodiversity of aquatic macroalgae flora in Igang Marine Station 	2013	New Study; Biodiversity of macroalgae in IMS will be established and will serve as benchmark to assess any impact of aquaculture in this site since IMS is one of the cage facilities of AQD

<ul style="list-style-type: none"> Biodiversity in the shore areas adjoining hatcheries and laboratories at Tigbauan Main Station 	2013-2014	New study; this project has been identified to start in 2012 but was not implemented; the study will document the possible impact of AQD's activities in the shore area near TMS.
<ul style="list-style-type: none"> Flora and fauna within freshwater areas 	2013-	New study; this project has been identified to start in 2012 but was not implemented; the survey will focus on the cage culture area of the Binangonan Freshwater Station to determine impact of aquaculture on biodiversity in this site
<ul style="list-style-type: none"> Biodiversity in milkfish fishing industry in Iloilo and Antique 	2013-2014	New study; the study will document the by-catch composition of milkfish fry sweeper and determine the impact of wild fry gathering
<ul style="list-style-type: none"> Hydrographic profiling of Igang Marine Station 	2013	Continuing study
Identify appropriate extractive species that may be used in IMTA <ul style="list-style-type: none"> Polyculture of sea cucumber with selected marine fish species 	2012-2014	Continuing study
<ul style="list-style-type: none"> Co-culture of seabass <i>Lates calcarifer</i> and seaweed <i>Gracilaria bailinae</i> in brackishwater pond 	2012-2014	Continuing study
<ul style="list-style-type: none"> <i>Anodontia philippiana</i> and <i>Holothuria scabra</i> as bioremediators in an intensive cage culture system 	2012-2013	Continuing study
<ul style="list-style-type: none"> Integrated Multitroph Aquaculture in Pangasinan 	2013-2015	New Study; identified to be conducted in 2012 but was not implemented; Appropriate seaweed species for milkfish Integrated culture will be determined and data on water and sediment quality in monoculture and polyculture systems will also be obtained.
<ul style="list-style-type: none"> Evaluation of seaweeds as bioremediator in intensive shrimp <i>Penaeus monodon</i> culture 	2013-2015	New study; identified for implementation in 2012 but was not implemented; Growth and survival of <i>P. monodon</i> in the presence or absence of seaweed will be assessed; improved water quality in intensive shrimp culture ponds will be achieved
<ul style="list-style-type: none"> Integrated culture of milkfish, seaweeds and sea urchin in cages 	2013-2015	New study; improved water and sediment quality in different polyculture systems; production of different species in polyculture system determined
<ul style="list-style-type: none"> Culture of tilapia in hydroponics system 	2013-2015	New study; the project will verify and demonstrate the production of agricultural crops from aquaculture effluents

<p>Develop and promote efficient and suitable environment-friendly culture systems</p> <ul style="list-style-type: none"> Determination of optimal conditions for sandfish <i>Holothuria scabra</i> culture 	2012-2016	Continuing study
<ul style="list-style-type: none"> Carrying capacity, decision support tools for freshwater systems in Australia and the Philippines 	2010-2013	Continuing study; to be terminated by mid-2013
<ul style="list-style-type: none"> Updating and conducting training and information dissemination to address issues on CCRF 	2013-2016	New project; identified for activity in 2012 but was not implemented; annual training course with participants from ASEAN Member Countries
<p>Conduct biological and ecological studies on species with potentials for resource enhancement</p> <ul style="list-style-type: none"> Stock enhancement of abalone <i>Haliotis asinina</i> to increase production from natural habitats 	2013-2015	New study; The study targets to increase production of abalone in the wild by 10%
<ul style="list-style-type: none"> Genetic distinctions of sandfish <i>Holothuria scabra</i> populations in Western Visayas 	2013-2014	New study; The study was supposed to start in 2012 but was not implemented; the project aims to characterize and distinguish genetically the sandfish population in Western Visayas
<ul style="list-style-type: none"> Stock enhancement of mud crabs <i>Scylla</i> spp. in the mangroves in Panay 	2012-2014	Continuing study
<ul style="list-style-type: none"> Stock enhancement of the abalone <i>Haliotis asinina</i> 	2012-2014	Continuing study
<ul style="list-style-type: none"> Application of molecular genetic markers in the conservation and management of marine genetic resources in Asia 	2012-2013	Continuing study; to be terminated by April 2013

4.2. Expected Outputs:

For each objective, the following are the expected output in 2013

- Assess impacts of aquaculture on biodiversity, and water and sediment qualities in the culture areas and adjacent ecosystems both in marine and freshwater systems:
 - Hydrographic mapping of Igang Bay completed
 - Biodiversity of Tigbauan Main Station near shore areas and Binangonan Freshwater Station determined. Data can be compared with previous studies to determine changes in biodiversity due to aquaculture and related activities.
- Identify appropriate extractive species that may be used in *Integrated Multi-Trophic Aquaculture (IMTA)*:
 - Data available on efficiency of different extractive species (seaweeds, sandfish, bivalve mollusk) in assimilating nutrients, sulfides and other aquaculture effluents
 - Production of selected commodities used in IMTA systems determined
- Develop and promote efficient and suitable environment-friendly culture systems:
 - Appropriate culture protocols in ponds, pens in ponds and other systems for sandfish determined
 - Models on carrying capacity of selected inland water bodies in the Philippines available
 - First session of training and information dissemination activity to address issues on CCRF conducted for the ASEAN region
- Conduct biological and ecological studies on species with potentials for resource enhancement.
 - Improved production of sandfish, abalone, mud crab in stock enhancement sites identified for the program.

PROJECT DOCUMENT

Program Category: Departmental Program
Project Title: Meeting Social and Economic Challenges in Aquaculture
Responsible Department: Aquaculture Department
Total Duration: 2012-2016

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 Project Description

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 interdisciplinary approaches; (ii) promoting sustainable aquaculture through enabling policies that support the management of natural and environmental resources; (iii) enabling mechanisms, institutions and infrastructure to encourage adoption of better aquaculture practices; (iv) understanding and improving linkages from production to marketing and trade of fishery products to support small and medium enterprise (SME) development; and (v) strengthening the capacity of aquaculture stakeholders by mainstreaming specific rural and peri-urban aquaculture programs and policies in local, national and international development programs.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

Major program activity	Duration	Remarks
Outputs related to Objective 1: Prioritizing collaborative R&D in aquaculture in the region		
<p>1. Co-established with stakeholders baseline information for designing demonstration activities that promote culture of new & indigenous aquaculture species in inland & coastal communities</p> <ul style="list-style-type: none"> • Tilapia hatchery & grow-out in Dumarao with people's organization (PO) and enterprising households • Milkfish cage culture in Guimaras with POs and LGU support with private company funds (Petron-Citi) • Grow-out demo of freshwater prawn in Laguna Lake in BFS & on-farm-site • Stock enhancement demo-trials of hatchery-bred abalone juveniles in Sagay • Started area capability development through stock enhancement in Batan Estuary 	<p>2010-2012</p> <p>2012-2013</p> <p>2010-2012</p> <p>2010-2012</p> <p>2012-2016</p>	<p>Collaboration with households and community guaranteed with partnership with LGU and national government agency (NGA, <i>e.g.</i> local offices under the Department of Agriculture)</p>
<p>2. Formulated adoption pathways for aquaculture technologies to guide MSECAP technology demonstration, implementation and adoption studies/activities</p> <ul style="list-style-type: none"> • Household-based adoption pathway for grow-out culture of giant freshwater prawn for families endorsed by LGU in Laguna Lake, Binangonan, Rizal • PO and household-based hatchery and grow-out culture of tilapia in cages in inundated rice fields in assisted Dumarao, Capiz with LGU and national government agency (NGA) assistance • PO-based and NGO-assisted adoption of cage culture of milkfish in Guimaras with LGU guardianship • Community-based stock enhancement adoption pathway in Sagay, Negros Occidental with LGU guardianship 	<p>Ongoing on-farm demo 2012-2013</p> <p>To be completed 2012</p> <p>To be completed 2012</p> <p>On-going on-site demo 2011-2014</p>	<p>Modalities for introducing and implementing aquaculture technologies and stock enhancement using hatchery-bred seeds identified and tested in selected freshwater, brackishwater and marine environments</p>
<p>3. Assisted and developed aquaculture-based small and medium enterprises (SMEs)</p> <ul style="list-style-type: none"> • Enterprising households that adopted hatchery and grow-out culture of tilapia sold tilapia harvest, fry & fingerlings in Dumarao, Aklan • Oil-spill affected PO in Guimaras supplemented incomes from harvest in milkfish cage culture • The Barangay Fisheries and Aquatic Resources Management Council (BFARMC) of Molocaboc in Sagay, Negros Occidental obtained funds from regulated harvesting and sale of abalones from community-based stock enhancement demo-site 	<p>2009- 2012</p> <p>2009-2012</p> <p>On-going from 2009-2014</p>	<p>Sustainability of technology adoption to form SMEs constrained by:</p> <p>lack of reliable supply of tilapia breeders in remote rural areas organizational solidarity and commitment</p> <p>inadequate financial management skills among POs and members immediate expectation of cash benefits from stock enhancement</p>

Major program activity	Duration	Remarks
<p>4. Determined through season-long training an on-farm economic indicators to determine viable technologies suitable for SMEs owned and operated by small-holder fish farmers</p> <ul style="list-style-type: none"> • Training conducted on-site throughout milkfish cage culture operations in Guimaras until harvest and profits obtained by POs and members • Training on breeding and culture of tilapia and catfish with complimentary training on composting of water hyacinth obstructing culture systems 	<p>Completed 2012</p> <p>Completed 2012</p>	<p>Technologies learned and profitable systems demonstrated but sustainability of SMEs were threatened after exit of SEAFDEC/AQD due to weak organizational solidarity</p>
<p>5. Assisted collaborators & established sustainable fish farm models that showcase commercially viable business using aquaculture technologies</p> <ul style="list-style-type: none"> • Net incomes earned in PO-based milkfish cage grow-out in Guimaras for oil-spill affected fishing households • Funds for BFARMC accrued from regulated harvesting and sale of abalones in community-based stock enhancement using hatchery-bred abalone juveniles in Sagay 	<p>To be completed 2012</p> <p>On-going 2009-2014</p>	<p>Sustainability of culture operations to supplement fishing incomes, especially during stock enhancement, is limited by lack of funds to support uptake of farm models among PO members</p>
Outputs related to Objective 2: Allocating R&D resources to address emerging issues		
<p>1. Recommended policies and up-scaled ordinances to support and maintain fisheries management mechanisms resulting from on-field studies</p> <ul style="list-style-type: none"> • Assisted LGU in formulating ordinance on abalone catch size regulation (6cm) as one of the strategies for managing enhanced stocks in Sagay Marine Reserve 	<p>2009-2010</p>	<p>Evaluate implementation and compliance to stock enhancement regulations in 2013</p>
<p>2. Increased adoption of full-cycle aquaculture (FCA) technologies by fish farmers, especially for high-value species to reduce and stop negative environmental impacts of unsustainable culture practice</p> <ul style="list-style-type: none"> • Training and IEC on use of seeds from aquaculture and provision of seeds from aquaculture to motivate adoption of FCA during start-up in project sites, namely; 1) giant freshwater prawn in Binangonan in Rizal, 2) tilapia and catfish in Dumarao in Capiz, 3) milkfish in Nueva Valencia in Guimaras, 4) shrimp in New Washington in Aklan; and 5) abalone in Sagay in Negros Occidental 	<p>On-going at various periods since 2009 to 2014</p>	<p>FCA understood and adopted but sustainability is constrained by access to sufficient quantities and qualities of seeds in remote rural communities</p>
Outputs related to Objective 3: Enhancing multi-agency collaboration		
<p>1. Enhanced the initiatives and collaboration forged by the ASEAN-SEAFDEC Human Resources Development Training in Rural Aquaculture in 2009 for launching further aquaculture capacity development training, and dissemination of aquaculture and resource enhancement protocols in the Region</p> <ul style="list-style-type: none"> • Published the program's objectives, activities and milestones in "Fish for the People" Newsletter of SEAFDEC to inform Member Countries on technology adoption methods, modalities and pathways experienced in project 	<p>2012</p>	<p>Aims to organize a regional social science R&D workshop to enhance collaboration and form technology adoption action plans in inland and coastal communities, especially on matters for securing food and income through aquaculture in the Region</p>

Major program activity	Duration	Remarks
sites in the Philippines and for potential dissemination to secure food and aquaculture livelihoods in the Region		

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Major program activity	Duration	Remarks
<i>On the proposed program activities, please also indicate briefly how the objective(s) of the program will be achieved from such activities</i>		
Objective 1: Prioritizing collaborative R&D in aquaculture in the region		
1. Increase number and scope of household-based collaboration through enhanced inter-agency partnerships on grow-out culture of giant freshwater prawn for families endorsed by local government units (LGUs) around Laguna Lake	2013	Additional funds and non-cash support required from all project partners, including BFAR
2. Evaluate implementation and organize up-scaling of abalone catch size regulation to support stock enhancement and grow-out livelihoods in Sagay City	2013	Enhance linkage with various stakeholder groups, through GOJ funds
3. Establish baseline information for community-based stock enhancement in Batan Estuary in Aklan	2013	Collaborative survey to be conducted with support from LGU, People's Organizations (POs) and University of the Philippines in the Visayas, with funds from RIHN (Government of Japan project)
4. Value-chain for Philippine seaweeds from farming communities to export trade of semi-refined carrageenan	2013-2014	Submit funding proposal to Philippine Department of Science and Technology
Objective 2: Allocating R&D resources to address emerging issues		
1. Upscale re-stocking of giant clams and engage community participation in San Joaquin, Iloilo	2013	Follow-up activities require inter-disciplinary and inter-agency collaboration
2. Survey compliance to and constraints to adoption of CCRF among Member Countries to review and recommend enabling policies	2013-14	Funds for inter-disciplinary and inter-agency collaboration needed to establish survey methods and its implementation
Objective 3: Enhancing multi-agency collaboration		
1. Network with socioeconomics and extension experts in Member Countries to initiate regional social science R&D collaboration and technology dissemination to secure food and aquaculture livelihoods in the Region	2013	Database of experts needed for inter-disciplinary and inter-agency collaboration in social science R&D
2. Conduct regional alumni and information utilization tracer study to assess the impact of AQD training & information programs in Member Countries and beyond the Region, especially on SEAFDEC/AQD's role in securing food and aquaculture livelihoods	2013-2014	Funds for inter-disciplinary and inter-agency collaboration needed to establish survey methods and its implementation



4.2 Expected Outputs (from the on-going studies)

- 1) Adoption pathways for freshwater aquaculture in remote rural farming community in Dumarao, Capiz; and for marine aquaculture in coastal fishing community in Igang, Guimaras;
- 2) Community-based stock enhancement strategy for abalone in Sagay Marine Reserve, Negros Occidental;
- 3) Baseline information on awareness of stock enhancement among fisherfolks and stakeholders in Batan Estuary, Aklan; and
- 4) On-farm experiences in grow-out culture of giant freshwater prawn in selected communities in Laguna Lake

PROJECT DOCUMENT

Program Category: Departmental Program
Project Title: Quality Seed for Sustainable Aquaculture
Responsible Department: Aquaculture Department
Total Duration: 2012-2016

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 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 through domestication, genetic and nutritional intervention, and the implementation of proper stock management protocols;
- 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. Project Description

Research involves the use of conventional means of stock improvement such as domestication, broodstock management, strain evaluation and selective breeding or genetic improvement of traditional and emerging freshwater and marine 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. The ultimate aim is not only to develop and verify technical knowledge but also to train and inform industry stakeholders, primarily fish farmers, advanced seed production methods and availability of seeds especially of improved stocks.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

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 quality seeds for stock release and conservation. Stocks for both purposes must both be genetically diverse to ensure fitness when these are farmed or released in specific environments. For stock release, the seeds produced by quality spawners will have to be genetically similar to the stocks in the receiving



area to maintain the genetic integrity of the population in the enhancement site. Supportive breeding or the use of broodstock from the enhancement site to subsequently produce seeds for restocking is often suggested to prevent further deterioration of the wild stocks in the release area. Following these basic concepts, R&D activities which address objective A, have been conducted with specific accomplishments described below.

Commercial species

Viral diseases have posed problems in shrimp aquaculture; hence, researches on the production of disease-resistant strains through selective breeding are being undertaken. Captive spawners of the white shrimp *Penaeus indicus* are being used in the development of disease resistant juveniles. Several generations (F₂ to F₄) of white shrimp from captive stocks have been produced and have been stocked for sex ratio and white shrimp syndrome virus (WSSV) challenge tests. Survivors from the challenge tests are currently being reared to broodstock size and will subsequently be used for the selective breeding program.

Meanwhile, tiger shrimps are currently being on-grown to broodstock size as part of the study on the development of techniques for the sustainable production of good quality captive *P. monodon* breeders. Potential broodstock from two families are currently being monitored for maturation and spawning. Apart from shrimp broodstock development methods, breeding performance of shrimp spawners can be enhanced through the administration of protein and lipid-rich feeds. An example is the mangrove polychaetes, or the *Marphysa mossambica* which contains 65.5% protein, 14% lipids, 5.5% arachidonic acid and 2.5% n-3 highly unsaturated fatty acids and is therefore very suitable as broodstock feed. Methods to breed and culture this mangrove polychaete are currently being developed by studying the species' biology. Meanwhile, two experiments which determine the effect of (a) settlement substrate: modified unnatural muddy sand vs. sun-dried clean sand and (b) type of feed: fish meal vs rice bran vs disintegrated seaweeds, on growth and production in glass aquaria are on-going.

In freshwater prawns, efficient and low-pollution diets for use in rearing potential broodstock were developed and tested. Partial results of breeding trial indicated that 20% cowpea level in the diet to replace fish meal protein could result to the highest number of berried females, weight of eggs/female and larval survival in the giant freshwater prawn. Grow-out diets (0, 15, 30, 45 and 60% replacement) were refined and used in tank and lake-based trials.

Collaborative studies have been initiated on the development of quality milkfish broodstock through conventional stock monitoring and management protocol. Local hatcheries have been surveyed and a proposed molecular marker-based broodstock management method on the Philippine milkfish *Chanos chanos* stocks commenced.

To improve reproduction in the donkey's ear abalone, maturation diets are currently being assessed. Eggs from abalone breeders fed on seaweed diet were significantly smaller than those fed the formulated maturation diet. Egg size increased with the increase in protein/energy (P:E) incorporation in the diet.

To identify stocks and consequently aid in determining genetic quality, molecular markers for seaweeds, *Kappaphycus* and *Eucheuma* species are being developed. DNA extraction methods are currently being optimized so that sufficient quantities of cellular DNA could be obtained for subsequent PCR amplification of the mtDNA *coxI* target region in both species. Another study which ultimately aims to improve existing seaweed strains deals with the isolation and culture of protoplasts from red seaweeds with potentially superior genetic traits. The preliminary approach involves the screening of naturally occurring bacteria in seaweeds and herbivorous aquaculture species (abalone, sandfish and rabbitfish which feed on seaweeds) as sources of extracellular polysaccharidases that will be useful in protoplast isolation.

Emerging species

An alternative indigenous prawn species which may have some good prospects in aquaculture is the *Macrobrachium lar*. Efforts to domesticate and evaluate the culture potential of this species are ongoing. Several stocks from different sources have been transported and success in transport has been optimized recently which resulted either to no or very few mortalities. Adult samples collected from the wild last July had the highest percentage of berried females thus indicating that the peak of the breeding season is during this month. For the growth trials, the daily growth rate of *M. lar* stocked in cages was slow compared to that of the giant freshwater prawn *M. rosenbergii*. To date, no successful metamorphosis to the post larval stage has been obtained hence larval rearing protocols for this species are continuously being refined.

Another species that is currently being domesticated is the climbing perch *Anabas testudineus*. Mature climbing perch injected with a single dose of HCG spawned 11-12 hours after hormone administration. The maximum mean hatching was 67.8%. Rearing and feeding protocols are currently being optimized to increase mean larval survival rate.

Efforts are being undertaken to develop broodstock conditioning methods for the sandfish, *Holothuria scabra* since it has been observed that old spawners decrease in body size and exhibit reduced reproductive performance. To enable effective broodstock conditioning, field broodstock holding facilities were recently constructed in Igang and Ajuy (pens) and the SEAFDEC Tigbauan Main Station hatchery (tanks). Broodstock collection from the wild have been done for the Igang and Ajuy stocks. Sandfish broodstock has been observed to decrease in size when held in tanks for about a month hence they are placed in natural sea pens after spawning to recover in size. Conditioning in the new and bigger (10m²) broodstock holding facilities are being evaluated. Apart from conditioning techniques, sandfish reproductive performance is being improved through refinements in the spawning protocols.

B. Refinement of hatchery and nursery management methods to improve seedstock quality and production

Commercial aquaculture species

As part of the study on the sustainable production and development of tiger shrimp broodstock and high health fry, shrimp hatcheries in Quezon, Camarines Norte and Camarines Sur were surveyed. It was noted that many of the shrimp hatcheries in Tagkawayan, Quezon ceased to operate due to marketing problems and non-payment of buyers.

To improve the production of marine fish larvae, nutritional intervention by way of tryptophan supplementation in the diets were used to minimize cannibalism. Preliminary trials using grouper larvae which involved weaning fish to a formulated diet were started.

For milkfish, initial feeding trials involving a comparison in the growth and reproductive traits of broodstock fed fortified (with ARA, betacarotene and vitamin C) vs non-fortified (control) diets were conducted. More eggs were obtained from the broodstock fed control diets (47.26million) against those fed the fortified diet (42.22 million). However, milkfish broodstock fed fortified diets had higher hatching rate (88% vs. 66%), spawning frequency (38 vs 33), and percent normal larvae (89% vs 79.6%). Milkfish broodstock kept at the integrated finfish broodstock hatchery complex were also fed fortified diets to demonstrate the impact of feeding fortified diets on the quality of the eggs and larvae produced.

More recently, in collaboration with University of the Philippines in the Visayas, and with funds from the Philippine Department of Science and Technology (DOST), AQD has initiated a collaborative project on the improvement of mudcrab *Scylla serrata* larval rearing protocol. Meanwhile, studies on the verification of feeding and water management methods in mudcrab seed production are also ongoing. Trials on the use of oxytetracycline based on the frequency of application (daily, every other day or every 5 days until the megalopa stage) in seed production were conducted. Preliminary results show that molt death syndrome was noted in larvae that have been treated more frequently. In another study



which assesses the impact of the use of enriched *Artemia* to improve larval survival, it was noted that survival from zoea 4 to megalopa was better in Selco-enriched *Artemia* compared to the control. Apart from this study, research on the influence of stocking density and tryptophan diets on the survival and growth of mudcrab *Scylla serrata* in the nursery phase is likewise being conducted. An experiment in netcages using 30 and 50 ind/m² stocking densities (factor A) and four feeding regimes, namely 100% mussel meat (M), M and pellets without tryptophan (M+AD basal), mussel plus pellets with 0.5% tryptophan (M+0.5TRP) and mussel plus pellets with 0.75% tryptophan (M+0.75TRP) (factor B), was conducted using early crab instar. Mussel meat plus 0.5TRP gave the highest survival at ~70.4% while the 30/m² gave the higher survival.

A strain of thraustochytrid *Schizochytrium* sp. (LEY7) will be used to enrich feeds for abalone. Mass production of the aforementioned thraustochytrid strain is on-going. Mass production methods for natural food organisms (*Nitzschia* sp and *Diploneis* sp) for postlarval abalone are also being refined. Innovations such as: a) use of bottom aeration, b) renewal of culture water/ re-fertilization of tank, c) presence/ absence of polyvinyl plates and d) varying light intensities were tested to increase algal cell yield in the culture water for the aforementioned natural food organisms. Several other natural food organisms namely, *Cocconeis* sp, *Nitzschia* sp and *Diploneis* sp. were studied for mass production as food for post-larval abalone. Techniques for the propagation of the aforementioned diatom species have been optimized.

Another nutritional intervention to improve abalone hatchery production is the administration of microparticulate diets as alternative feed. Feeding trials in large-scale tank systems are being conducted. Preliminary results showed that abalone reared on agar-based microparticulate diet resulted to bigger shell lengths and higher survival rates. Finally, a study that deals with the production of *Gracilariopsis heteroclada*, the primary diet of abalone, was implemented. The culture was done in ponds and in an intertidal area. High incidence of grazing posed a problem to cultures in Sabang and Panubolomn in Guimaras. A new site is being considered in view of this constraint. As for the pond culture trial, the ponds in Barangay Igang gave better results and modifications in the culture protocol were made to further improve the harvest.

Emerging species for aquaculture

The reproduction and seed production of climbing perch, a species indigenous to Laguna de Bay is currently being studied. Climbing perch *Anabas testudineus*, broodstock were injected with a single dose of human chorionic gonadotropin (HCG) and spawned 11 to 12 hours after hormone administration. Maximum mean hatching was noted at 67.8%. Efforts to determine the optimum larval rearing protocol for the silver therapon, *Leiopotherapon plumbeus* are also underway. A feeding preference experiment was conducted using a semi-intensive method in outdoor concrete tanks containing water preconditioned for two weeks to allow natural food to thrive. Gut analyses done at the various larval development stages showed detritus, rotifers, copepod nauplii, cladocerans and insect larvae .

Hatchery techniques are being refined to improve seed production in the pompano *Trachinotus blochii*. Oocyte development in the pompano was monitored. Oocyte size was not significantly different at the different lunar phases. Oocyte diameter ranged from 0.40 to 0.45 mm. On the other hand, male fish were milting when the fish were sampled during all the lunar phases, these indicate that gonadal development does not follow the monthly lunar cycle. Apart from the reproductive biology, the larval physiology of the pompano is also being looked into. Later, research on the biology of reproduction of another emerging species, the spotted scat *Scatophagus argus* or kikeru will be undertaken as well.

Refinements in pompano seed production methods were also made through the development and evaluation of weaning diets. The weaning diets were assessed in a comparative rearing trial using a diet originally formulated for grouper (as control) and a weaning diet for pompano (WDP). Preliminary results showed an increase in weight for treatments fed the pompano weaning diet (817.6mg) compared to the control (527mg). Moreover, both the standard length and survival in WDP-fed fry were significantly higher than those fed the control diet (27.53mm vs. 22.45mm and 89.92 % vs. 65 %, respectively).

A verification study on the brackishwater nursery pond culture of pompano using formulated diets with varying lipid levels will be conducted. Juveniles grew best when fed formulated diets with 44-48% crude protein and 9-13.5% crude fat. Cannibalism was not noted and size uniformity was achieved by means of sorting.

To improve sandfish juvenile survival, broodstock were collected from Igang and Ajuy. It was noted that broodstock held in tanks for one month shrunk thus the stocks are allowed to recover in natural sea pens. Spawning trials gave fertilization counts from 42,000 to 3,500,000 but survival to stage 1 juveniles were about 0.26 to 1.03% only. Nursery production in floating hapas result to stage 1 juveniles which grew to 3 g in one month and 6 g in two months.

Species for stock enhancement

For the Napoleon wrasse *Cheilinus undulatus*, zooplanktons were collected from estuarine areas of Dumangas, Binagawan, Leganes, Oton and San Joaquin in Iloilo, Philippines. Of the species collected, the nauplii of *Pseudodiaptomus* sp were <80 microns can be used as initial live food for the Napoleon wrasse larvae. Feeding trials shall commence as soon as larvae become available. Apart from the study on larval food assessment, the distribution of Napoleon wrasse in Bohol was surveyed. This information is vital to the management of Napoleon wrasse in known natural habitats.

The seahorses, *Hippocampus barbouri* and *H. comes* are continuously being propagated in the SEAFDEC/AQD hatchery for possible release in Taklong Island, a site which is currently being assessed for its suitability for stock enhancement. Results of the site assessment show its suitability from a biological/ecological perspective, but interviews with local fishermen point to the fact that open access to fishery resources might pose a problem with regard to the management of stocks that will be released in the area.

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 modest 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 soon for the mudcrab). For the mudcrab, stress tests (particularly formalin tolerance and disease challenge response tests) are being done to determine strain level differences in the effort of identifying stocks with better fitness attributes. Two strains (Camarines Norte and Surigao) were used in the trials and results showed that the newly acquired Camarines broodstock had 0% mortality at 0-40ppm formalin while the Surigao zoea stock had 0, 18.3, 66.7 and 100% cumulative mortality at 0, 20, 30 and 40ppm formalin. Meanwhile in a preliminary trial on disease tolerance, juveniles injected with *Vibrio harveyi* at 10^6 , 10^7 and 10^8 cfu/ml and saline solution (control) had cumulative mortalities of 0 for both 0 and 10^6 cfu/ml treatments and 47.8 and 93.7% for 10^7 and 10^8 cfu/ml.

For the tiger shrimp, F1 batches from founder stocks collected from several sites (Bohol, Davao and Antique) are currently being on-grown to broodstock size. Subsequent batches which have attained more than 50 g weights will be considered for use in the breeding program and will be harvested in a month's time.

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. In 2011, a reciprocal mating scheme was tried as a scheme to improve growth and breeding performance in two lines of the giant freshwater prawn (OC6 and NC2). This year, two other broodstock schemes are being assessed using OC7, NC3 and crossbred line-breeders produced and on-grown from the 2011 experiment. The methods are: a) frequent male broodstock replacement and b) sex ratio experiment. For the frequent broodstock exchange, the scheme entails using new female spawners from within the same batch and strain which are paired off with males replaced at specified intervals. The efficiency of this method is being evaluated through a comparison of reproductive traits and later quantitative



characters (growth rate and survival) when subsequent progeny testing trials are done. For the sex ratio experiment, several sex ratios (1M:1F, 1M:2F and 1M:4F) are being compared in a broodstock experiment set in cage enclosures using the crossbred lines (OC x NC and NC x OC) stocks following the same sampling protocols as in the male broodstock replacement study.

Saline-tolerant tilapias are being screened for subsequent selective breeding of enhanced traits. Prior to any selective breeding scheme, an assessment of the growth, survival and fillet yield in the Mozambique tilapia, a commercial tilapia hybrid (red tilapia) and saline adapted Nile tilapias (namely, BEST and the SEAFDEC-selected tilapia) was conducted in tanks and/or ponds with brackishwater. Rearing trials comparing growth of the aforementioned stocks were conducted in plastic-lined brackishwater ponds in the Tigbauan Main Station and in brackishwater tanks in the Binangonan Freshwater Station. The growth trial in ponds and a sensory evaluation on the four stocks grown and harvested from the same pond experiment were completed recently. Statistical analysis on the growth and sensory evaluation data are underway.

Hybridization is currently being done on the local commercial abalone species (*Haliotis asinina*) by crossing this with other Philippine abalone species, *Haliotis planata* and *Haliotis glabra*, to enable the production of stocks/species with improved traits. *H. asinina* x *H. planata* hybrids were noted to take a longer growing period (270 days) compared to pure *H. asinina*. Moreover, the body weight (23.2g) and survival (59%) of *asinina-planata* hybrids were lower compared to the pure stocks (survival=74%). Similarly, the growth of the pure *H. asinina* was higher than the *H. asinina* x *H. glabra* hybrids but survival was noted to be higher in the hybrid (survival = 89%) compared to the pure stock (survival=70%). On another note, new *H varia* and *H planata* breeders were collected from Palawan. A total of 140 hybrids were produced. Pure lines were also produced but no juveniles survived due to continuous rains which resulted to silted and low salinity water in the hatchery. Meanwhile, hybrids stocked in sea based cages are being monitored continuously for growth performance.

To improve the fecundity and seed quality of the abalone *H asinina*, wild stocks acquired from Masbate and Palawan were used for breeding, strain performance comparison (using Masbate, Palawan and hatchery stocks) and later for genetic selection. The plan is to produce fifteen families for a selective breeding study. These families will be monitored for settlement rate, growth and survival until the late juvenile stage and will be sampled for genetic marker analysis. In another sub-activity, using different individuals from Masbate and Palawan, growth of juveniles sorted and then reared at three size categories are being monitored and compared. Data from the strain comparison runs are continuously being collected.

Methods to develop resistant strains of the seaweed *Kappaphycus* and reduce epiphytes are being studied. Preliminary infection assays on *Kappaphycus* using the Calatagan, Cabalagnan and Narra samples were conducted for four weeks but the explants developed shoots instead of being infected. Meanwhile, the study on the epiphyte reduction started with the collection of *Kappaphycus* and *Eucheuma* specimens with and without epiphytes. These are now being grown in the laboratory. Another study involves the determination of ploidy in *Kappaphycus*. Several methods have been tried but with limited success. DAPI staining will be tried. Finally a grow-out experiment is also being done to determine the growth of tissue-cultured *Kappaphycus* using different commercial fertilizers. Preliminary results showed that there were no significant differences between fertilized and unfertilized stocks.

D. Adoption of economically viable systems to produce sufficient seedstock

Several fish/shellfish production projects are being implemented at SEAFDEC 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. A total of 129,104 pcs of three-month-old abalone juveniles were produced. The survival rate ranged from 0.11 to 1.07%. Meanwhile, from January to September, the SEAFDEC/AQD abalone demonstration hatchery produced 80,180 pcs of 5-8 mm shell length abalone juveniles. The survival rate from veliger to juveniles (90 days of culture) ranged from 0.28 to 1.0%.

E. Capacity-building of fishfarmers and other industry stakeholders on appropriate breeding and larval rearing technologies

Several specialized training courses were offered to local government representatives, private sector investors, feed company staff (BMEG) 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. Technical assistance was also provided to local and international private sector clients through the Agree Build Operate and Transfer Aqua Negosyo Program.

Project/Activity Title	Duration	Remarks
CRUSTACEANS		
SHRIMPS		
Selective breeding of: (i) <i>Penaeus indicus</i> : disease resistance in juveniles from captive spawners; (ii) <i>P. monodon</i>	2012-2014	
Methods for sustainable production of good quality broodstock, spawners, high health fry in <i>P. monodon</i>	2011-2014	
GIANT FRESHWATER PRAWN		
Broodstock management schemes for improved growth, reproduction in <i>Macrobrachium rosenbergii</i>	2010-2014	
Efficient low pollution feeds for giant freshwater prawn broodstock	2010-2014	
Domestication, culture potential assessment of <i>M. lar</i>	2010-2013	
MUDCRABS		
Improvement of mudcrab <i>Scylla serrata</i> larval rearing protocol	2012-2014	
Strategies to reduce cannibalism in mudcrab nursery	2012-2014	
Selective breeding of mudcrab	2010-2014	
Effect of stocking density, tryptophan diets on mudcrab growth and survival in the nursery	2012-2014	
Verification of feeding, water management methods in mudcrab seed production	2012-2015	
MARINE FISHES		
Improvement of fry quality through refinement of milkfish broodstock management	2011-2014	
Application of molecular markers in milkfish broodstock management	mid-2012 to mid 2015	
Optimization of seed production of milkfish through feeding fortified diets	2006-2014	
Tryptophan supplementation to reduce larval cannibalism	2012- mid2013	
Refinement of seed production methods for grouper, red snapper, sea bass, rabbitfish, pompano	2008-2013	
Development of hatchery techniques for emerging species, e.g. pompano, scat	2010-2014	
Stock enhancement of Napoleon wrasse <i>Cheilinus undulates</i>	2010-2014	
Evaluation of formulated diets during nursery rearing of pompano in brackishwater ponds	2011-2012	
Production of seahorse juveniles for stock enhancement	2010-2014	
FRESHWATER FISHES		
Selective breeding for enhanced traits in saline tolerant tilapias	2010-mid 2013	
Mass production of sex-reversed and mixed sex Nile and red hybrid tilapias	2008-2016	
Reproduction and seed production of <i>Anabas testudineus</i>	2011-2015	To be merged w/ study on therapon from 2013 onwards
Larval rearing of <i>Leiopotherapon plumbeus</i> under lab conditions	2010-2015	To be merged w/ study on climbing perch from 2013 onwards

SHELLFISHES		
Experimental hybridization between Philippine native abalone species	2008- 2014	
Use of thraustochytrid as live feed enrichment for fish larvae and component in abalone formulated diets	2010-2014	2012 – completed work on abalone 2013-2014 – work on fish
Cultivation of <i>Cocconeis</i> for settlement, growth and PL abalone survival	2009- 2014	
Refinement of hatchery techniques for abalone thru (1) fecundity, seed quality improvement from newly domesticated abalone; (2) transport techniques; (3) genetic stock evaluation; (4) bacterial and algal community structure in biofilms of settlement plates	2009-2013	
Experimental hybridization of Philippine native abalone species	2008-2014	
Maturation diet for abalone: effect of P:E on reproduction	2010-2014	
Microparticulate diet as alternative feed in abalone hatchery (small vs. large-scale tanks)	2012-2014	
Production of abalone juveniles (demonstration hatchery)	2008-2015	
Large-scale production of abalone juveniles	2008-2013	
OTHER INVERTEBRATES		
Enhancement of sandfish hatchery and nursery techniques	2011-2016	
SEAWEEDS		
Development of ice-ice resistant strains of <i>Kappaphycus</i> and technology for reduction of epiphytes	2011-2015	
Development of molecular markers for <i>Kappaphycus</i> , <i>Eucheuma</i>	2012-2015	
Purification and characterization of agarases and carageenases from polysaccharide-lysing bacterial isolates of seaweeds and herbivorous species	2012-2014	
Nursery rearing methods for production of <i>Kappaphycus</i> seedlings	2012-2015	
Culture of <i>Gracilariopsis heteroclada</i> in pond and in intertidal area	2012-2014	

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

4.1 Planning of the Project Activities

Major program activity	Duration	Remarks
CRUSTACEANS		
SHRIMPS		
Selective breeding of (i) <i>Penaeus indicus</i> : disease resistance in juveniles from captive spawners; (ii) <i>P. monodon</i>	2013 – 2014	
Methods for sustainable production of good quality broodstock, spawners; high health fry in <i>P. monodon</i>	2013-2014	
GIANT FRESHWATER PRAWN		
Broodstock management schemes for improved growth, reproduction in <i>Macrobrachium rosenbergii</i>	2013-2014	
Efficient low pollution feeds for giant FW prawn broodstock	2013-2014	
Domestication, culture potential assessment of <i>M. lar</i>	2013	
MUDCRABS/BLUE SWIMMING CRABS		
Improvement of mudcrab <i>Scylla serrata</i> larval rearing protocol	2013-2014	
Strategies to reduce cannibalism in mudcrab nursery	2013-2014	
Selective breeding of mudcrab	2013-2014	
Effect of stocking density, tryptophan diets on mudcrab growth and survival in the nursery	2013-2014	

Verification of feeding, water management methods in mudcrab seed production	2013-2015	
National R&D Program on blue swimming crab: optimization of hatchery and nursery protocols	2013-2015	
MARINE FISHES		
Improvement of fry quality through refinement of milkfish broodstock management	2013-2014	
Application of molecular markers in milkfish broodstock management	until mid 2015	
Optimization of seed production of milkfish through feeding fortified diets	2013-2014	
Tryptophan supplementation to reduce larval cannibalism	until mid2013	
Refinement of seed production methods for grouper, red snapper, sea bass, rabbitfish, pompano	2013	
Refinement of rearing methods for grouper fingerling production in cages in ponds	2013	
Development of hatchery techniques for emerging species, e.g. pompano, scat	2013-2014	
Stock enhancement of Napoleon wrasse <i>Cheilinus undulates</i>	2013-2014	
Copepod production in ponds using different fertilization schemes	2013-2014	
Nursery culture (first phase) of high value marine species – use of shelters, sorters etc	2013-2015	
Production of seahorse juveniles for stock enhancement	2013-2014	
Screening of herbivores (mullet, acanthurids) for aquaculture potential	2013-2016	
FRESHWATER FISHES		
Selective breeding for enhanced traits in saline tolerant tilapias	Until mid 2013	
Mass production of sex-reversed and mixed sex Nile and red hybrid tilapias	2013-2016	
Reproduction and seed production of <i>Anabas testudineus</i>	2013-2015	To be merged w/ study on therapon from 2013 onwards
Larval rearing of <i>Leiopotherapon plumbeus</i> under lab conditions	2013-2015	To be merged w/ study on climbing perch from 2013 onwards
Catfish seed production	2013-2015	To support requirements for catfish grow-out study
SHELLFISHES		
Experimental hybridization between Philippine native abalone species	2013- 2014	
Use of thraustochytrid as live feed enrichment for fish larvae and component in abalone formulated diets	2013 -2014	2012 – completed work on abalone 2013-2014 – work on fish
Cultivation of <i>Cocconeis</i> for settlement, growth and PL abalone survival	2013- 2014	
Refinement of hatchery techniques for abalone thru: (1) fecundity, seed quality improvement from newly domesticated abalone; (2) transport techniques; (3) genetic stock evaluation; (4) bacterial and algal community structure in biofilms of settlement plates	2013	
Experimental hybridization of Philippine native abalone species	2013-2014	
Maturation diet for abalone: effect of P:E on reproduction; Microparticulate diet as alternative feed in abalone hatchery (small vs. large-scale tanks)	2013-2014	
Production of abalone juveniles (demonstration hatchery)	2013-2015	

Large-scale production of abalone juveniles	2013	
OTHER INVERTEBRATES		
Enhancement of sandfish hatchery and nursery techniques	2013-2016	
SEAWEEEDS		
Development of ice-ice resistant strains of <i>Kappaphycus</i> and technology for reduction of epiphytes	2013-2015	
Development of molecular markers for <i>Kappaphycus</i> , <i>Eucheuma</i>	2013-2015	
Purification and characterization of agarases and carageenases from polysaccharide-lysing bacterial isolates of seaweeds and herbivorous species	2013-2014	
Nursery rearing methods for production of <i>Kappaphycus</i> seedlings	2013-2015	
Culture of <i>Gracilariopsis heteroclada</i> in pond and in intertidal area	2013-2014	

4.2 Expected Outputs in 2013

SHRIMPS:

- Improved growth, breeding performance; healthy broodstock produced; inbreeding minimized; and
- Protocols (sex ratio, stocking density from market size to broodstock) established.

FRESHWATER PRAWNS:

- Optimal broodstock management method defined;
- Improved efficient low pollution prawn broodstock diet developed; and
- Stocks surveyed and domesticated, larval rearing and grow-out culture requirements established.

MUDCRAB/BLUE SWIMMING CRAB:

- Larval rearing protocol improved;
- Mass production method of annelids established and tested as feed for mudcrab;
- Reduced cannibalism;
- Improved growth, breeding performance;
- Healthy broodstock produced; inbreeding minimized;
- Nursery production improved;
- Reduced seed production cost and increased survival; and
- Optimal hatchery and nursery protocol 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%; lower FCR;
- Optimal conditions for larval rearing established; established protocols for seed production;
- Nursery rearing of marine fishes improved;
- Target production achieved; and
- Potential aquaculture species identified.

FRESHWATER FISHES

- Best saline tolerant stocks identified;
- Tilapia fingerlings produced; income generated; production target attained;
- Breeding and seed production protocol defined for emerging species; and
- Larval rearing methods optimized for emerging species.

SHELLFISHES

- Better stocks produced through hybridization;
- Conditions for mass production established; traustochyrid strain tested as enrichment for larval live feed;
- Optimal culture method for *Cocconeis* production determined;

- Improved hatchery methods;
- Best genetic stock of abalone identified and used in selective breeding;
- Better abalone stocks produced through hybridization;
- Effect of dietary P:E levels on abalone breeding known; effective diet for abalone broodstock developed;
- Production technology demonstrated and disseminated (monthly production: 16 thousand of 1.1-1.5 cm); and
- Abalone juveniles produced (24.3 thousand/month of 1.1-1.5cm abalone)

OTHER INVERTEBRATES

- Consistent method for broodstock conditioning for spawning established

SEAWEEEDS

- Disease-resistant strains developed;
- Cox I sequence determined; PFLP PCR protocol available;
- Protoplast isolation protocol using new enzymes developed;
- Recombinant carageenase and agarase available;
- Nursery rearing protocol optimized; and
- Culture method defined; production target achieved.

FOR ALL SPECIES

- 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; and
- Information disseminated through publications and participation in fairs and exhibits.

**OTHER PROGRAMS
FOR THE YEAR 2012-2013**

Training Department

Project Title	2012	2013
Cetacean Research in Southeast Asia Waters: Cetacean Sighting Program	Y	N

Y = Program proposed/implemented during the year

N = Program not proposed/implemented during the year



PROJECT DOCUMENT

Program Category: Other Program
Project Title: Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program
Lead Department: Training Department
Total Duration: 2008-2012 (Completed)

1. INTRODUCTION

Cetacean is one of the most distinctive and highly specialized orders of mammals meant whale, dolphins, and porpoises. They include the largest animal that has ever lived, the blue whale; the highly intelligent and communicative dolphins; the tusked narwhals and blind river dolphins and singing humpback whale, nearly eighty living species in all. Most species are living in marine environment but some dolphin species are found in both marine and freshwater such as Irrawaddy dolphin (*Oranella brevirostris*) which is distributed in near shore tropical and subtropical marine waters, often associated with estuaries and mangrove forest. They also occur far upstream in the Ayeyarwady (formally Irrawaddy) river system of Myanmar, Makhakam river of Indonesia, and Mekong river system of Loa, Cambodia, and Vietnam.

At present, information on composition of abundant of cetacean species in the Southeast Asian waters are still not sufficient. Most of cetacean research has been conducted based on the field observation, and stranded specimens recording at shore. Not many research works have been conducted by sighting survey. With regard to the survey plan of SEAFDEC research vessels in the Southeast Asia waters, cetacean species such as dolphin and whale were often found by sighting during the cruising to/from SEAFDEC Training Department (TD). The research vessels of TD have sailed annually over 5000 nm to many sea areas in the region. In order to collect scientific information on the distribution and composition of cetacean species in Southeast Asian waters, the cetacean research by SEAFDEC was initiated since 2008.

To implement and promote the activities, over the year, a total of 13 cruises have been conducted for the cetacean sighting survey using SEAFDEC research vessels namely M.V. SEAFDEC and M.V. SEAFDEC 2, and other national research vessels. In this connection, at the 31st SEAFDEC Program Committee Meeting in 2008, the Philippines expressed the willingness to assist in the collection of data related to cetacean sighting through the existing research cruises of the M.V. DA/BFAR, and requested TD to train BFAR staffs on cetacean sighting activities by providing the necessary expertise and data to be collected. Moreover, TD has conducted the internal training course for TD staff on cetacean sighting program in November 2008, and the outcome from such training and other related information could be provided to the Member Countries to enable them to support the cetacean sighting activities.

2. PROJECT

2.1 Objectives

- 1) Develop regional inventory of all cetacean namely whale and dolphin found in the Southeast Asian Waters through the cetacean sighting program using SEAFDEC research vessels;
- 2) Gather information on the accidentally death of cetacean on the coastal area of the region;
- 3) Gather information on the cetacean sighting program existed in the Southeast Asian countries;
- 4) Enhance human resources capacity on the cetacean research works in the region;
- 5) Disseminate information on species distribution in relation to the coastal and marine ecosystem in the Southeast Asian waters; and
- 6) Share and exchange information on the appearance of large cetaceans in the coastal area and offshore of the countries in the region.

2.2 Project Description

In last two decades, cetacean distribution in the Southeast Asian water is very limited. Systematic study on whale and dolphin biology in the Member Countries has initiated in early 1990 by foreign researchers in collaboration with national academic institutions. At present, information has been obtained through stranded specimens and direct sighting surveys. Most of research works have been conducted mainly by responsible national agencies.

In Southeast Asian waters, many questions are raised up that “do we have large cetacean such as whale rather than dolphin coming near to the coastal area”. As it is noted that most of large cetacean are highly migratory species in the ocean and not often found around the continental shelf or coastal zone. However, the large cetacean has been found (stranded) and recorded frequently in the coastal areas in the Southeast Asian waters. And one of the concerns raised up by the Member Countries during SEAFDEC Council Meeting was that the present declining of pelagic fish stock in the coastal area might have interaction with the large cetacean feeding behavior.

Therefore, for better understanding on cetacean distribution and interaction with fisheries from a regional perspective, this project provides a series of technical meetings and on-the-job trainings on the cetacean research work and its survey methodology. The program of activity includes the support of the cetacean sighting program by using SEAFDEC and other national research vessels in close collaboration and coordination with the Member Countries and other responsible national agencies, such as the using of R.V. DA-BFAR of the Philippines, R.V. Chulabhorn and F.R.V. Mahidol of Department of Fisheries – Thailand, and Department of Marine and Coastal Resources of Thailand.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2012

Project/Activity Title	Duration	Remarks
1. Workshop/Consultation visit and preparation work	Nov	The project staff participated to relevant events (<i>e.g.</i> the meeting to be organized by International Whale Commission) in order to promote SEAFDEC activities related to cetacean program and to exchange information among the cetacean scientists.
2. Information gathering/collection and actual survey	June~Dec	Information collection on cetacean based on the sighting program on-board M.V. SEAFDEC 2 during cruising to/from Vietnam waters in pre- and post-monsoon period.
3. Data analysis and information dissemination	Dec	1) Promotional materials 2) Publication of the proceeding of project report and Manual/Handbook on Cetacean Identification and Appropriate Techniques in Population Assessment 3) Report of the end-of-project meeting (organized in early 2012).

4. PROPOSED ACTIVITIES FOR THE YEAR 2013

The project will be terminated by 2012. However, all achievements of the project have been published through various media (CDs, books/reports, website, etc.).

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

Project Title	2012	2013
Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (ASEC, Islamic Development Bank, SEAFDEC)	Y	Y
Establishment and Operation of a Regional System of Fisheries <i>Refugia</i> in the South China Sea and Gulf of Thailand (TD/UNEP/GEF/SCS)	Y	N
Improving Methodologies and Capacity for the Collection of Capture Fishery Statistics in the Southeast Asian Region (new)	-	Y
Fisheries Resources Management on Important Pelagic Species for Sustainable Fisheries in the Sulu-Sulawesi Sea (new)	-	Y

Y = Proposed as pipeline project during the year

N = Not proposed as pipeline project during the year



ASEAN Cooperation Project Document

Project Purpose Code:

Project Title: Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management

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

Sponsoring ASEAN Body

Sectoral Committee/Main Body: ASEAN Sectoral Working Group on Fisheries (ASWGF)

Meeting Number/Date:

Working Group/Sub-Committee:

Meeting Number/Date:

Proponent’s name and address: Southeast Asian Fisheries Development Center (SEAFDEC)

Date of preparation: 16 January 2009

Proposed funding source: Islamic Development Bank (IDB)

Project budget

Description	Total Allocation (\$)
1. Contracts with Individuals	_____
2. Contracts with Organizations	_____
3. Equipment	_____
4. Supplies and Services	_____
5. Travel and Per diem	_____
Total:	250,000

Information below to be completed by the PCU

Recommendation of Secretary-General/Project Appraisal Committee

PAC Meeting Number/Date:

Endorsements:

Approval of ASEAN Standing Committee

Meeting Number/Date:

Endorsements:



ASEAN Cooperation Project Document Format

1. Problem to be addressed

The first paragraph of the Project Document will define the problem(s) that the project will address. This section should be limited to a brief statement of the problem, as determined in the problem analysis. In general, one project should focus on one large problem. The statement of a single problem will lead to the statement of a single objective.

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

2. Background, problem analysis and justification

a. Background

The Background section of the Project Document should provide factual information about the context of the problem that is to be addressed. This section should also include description of the present situation, any related current and past ASEAN activities, and the relevant ASEAN policies and plans of action.

The Southeast Asian region is home to the largest Muslim populations in the world (estimated to be about 240,000,000 in 2007), which is almost one-half (about 42%) of the region's total population (in 2007: 571,337,070) with Indonesia having the world's biggest Muslim population (88% of its total population of 225,000,000). Most of the Muslim communities are in coastal areas with fishing as an ethnic occupation. Since the region's coastal fisheries resources, once viewed as inexhaustible source of fish protein for human consumption have deteriorated, concerns have therefore increased for the protection and conservation of the coastal resources for sustainable livelihoods and food security of the coastal dwellers.

The ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People" (hereafter refers to "the Millennium Conference) held in Bangkok from 19 to 24 November 2001, recognized the importance of sustainable fisheries for food security and the livelihoods and well-being of the ASEAN people. The Conference was successfully concluded by the adoption of "*the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region*" by the fisheries related ministers and senior officials of ASEAN-SEAFDEC Member Countries as the regional common fisheries policy and priority actions.

Within the regional context, fisheries sector is being addressed among other priorities to accelerate the regional economic integration as spelt out in the **ASEAN Vientiane Plan of Action** as well as regional collaboration in promoting sustainable fisheries development through the ASEAN-SEAFDEC Fisheries Consultative Group Mechanism under the recently adopted **ASEAN-SEAFDEC Strategic Partnership Program (FCG/ASSP)**.



Most of the coastal fisheries communities in the ASEAN Region are characterized as small-scale fisheries. The production from small-scale fisheries contributes to national economic growth. Nevertheless, the endowment, potential, and resilience of the small-scale sub-sector have not been recognized and highlighted, while it is immensely contributed to resource utilization. This critical issue should also be addressed along line with the **ASEAN Socio-Cultural Community (2008-2015)** that the region's aspiration to lift the quality of life of its peoples through cooperative activities that are people-oriented and environmentally friendly geared towards the promotion of sustainable development.

In addition, the coastal dwellers are also prone to the drastic change of coastal environment. In December 2004, coastal communities in Indonesia, Thailand, Malaysia, and Myanmar had to suffer from the great loss of lives and assets due to the unprecedented scale of earth quake and Tsunami. Such large-scale natural disaster further aggravated their poverty status of the people in the areas. In respond to the tragic incident, ASEAN community adopted "**ASEAN Declaration on Action to Strengthen Emergency Relief, Rehabilitation, Reconstruction and Prevention on the Aftermath of Earthquake and Tsunami Disaster of 26 December 2004**" as their policy commitment to support Tsunami affected people. The coastal villages throughout the region are also facing hardships due to the impact from climate change such as sea level rise, increase of sea temperature, change of fish habitat and its ecosystem, natural hazards, etc. The ASEAN-SEAFDEC Member Countries have put a serious concern on this issue and recently identified the **required adaptive measures and activities to mitigate the impacts of climate change** to be undertaken by SEAFDEC and the national agencies responsible for fisheries in the Member Countries. In addition, Indonesia as the lead country also prepared a proposal on the **ASEAN Strategy Addressing the Impact of Climate Change on Agriculture, Forestry and Fisheries**, for further submission to the SOM-AMAF.

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

b. Problem analysis and justification

The Problem Analysis and Justification section is the most important section of the Project Document. The section should present a logical analysis that justifies regional action by ASEAN. The section should discuss the following topics and questions:

Problem analysis What are the underlying causes of the problem to be addressed? Details from the problem analysis should be presented here.

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

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

fishermen are driving resources down both in terms of quality and quantity; and they will be finally caught in a poverty trap.

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

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

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

Regionality Is the problem regional in nature? Can the problem and its causes be effectively and appropriately addressed at the regional level? Answers to these questions derived from the regionality analysis exercise should be presented here.

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

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

Participation Which ASEAN Member Countries want to participate in this project?

For the project implementation, high priority will be given to ASEAN countries with the highest Muslim populations, such as Indonesia, Malaysia, and Brunei Darussalam (88%, 59% and 67% Muslim populations, respectively). Other Muslim communities in the Philippines, Thailand and Cambodia will



also be involved in the project implementation through technology transfer and dissemination of experiences learned from the three priority countries considering their respective problems and needs.

Beneficiaries Who will be the likely beneficiaries of a solution to the problem or need?

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

Commitment and sustainability What complementary national actions are interested member Governments currently implementing to address the problem or would be needed along with regional action to fully address the problem? Are the concerned ASEAN member Governments committed to bearing the costs of required complementary national actions and the long-term costs of regional action?

Project implementation requires strong commitment to achieve the objectives and activities of under the project both at national and local levels. National fisheries related agencies are requested to provide in-kind contribution and keep close collaboration with SEAFDEC to facilitate the project implementation, especially coordination with stakeholders, and also ensuring that the implementation of the project would along line with national instruments. Financial contribution from national government will be only required in extraordinary cases which could not be covered by the project. The identified future follow-up activities based on the outcomes of the project should be follow-up by respective national governments to maintain sustainability of the project promotion.

3. Possible solutions

The purpose of the Possible Solutions section of the Project Document is to ensure that alternative strategies or approaches to solving the project problem have been identified and assessed. What possible approaches to the problem were identified in the problem analysis? Are there other possibilities? What are the advantages and disadvantages of pursuing each option? What would be the consequences of doing nothing? What strategy has been selected as the best approach to solve the problem? Why is this option regarded as the best approach?

Coastal communities are highly dependent on fishing for their livelihoods with fewer possibilities to generate alternative source of income. They are thus a strong potential group to risk to the resource base and habitats. Declining of fish stocks due to over fishing lead to lower production, while increasing competition and conflict between different users. It is widely recognized that not only improving coastal fisheries management that important but also controlling the effects of human activities on the environment are necessity. Linkage between sustainable environment and sustainable livelihoods is a direct variation. Past and present, there are the areas that solve the problems by centralized management and it has proved of ineffective results. There is a growing trend towards a more decentralization of governance in general as well as in fisheries management. Management responsibilities are to share among national government, local organization and institutions, communities and other stakeholders. This type of so called 'co-management System' is becoming popularity and has been successfully implemented in some countries in ASEAN.

To address the issues and problems in coastal communities, policies and institutions in respective ASEAN Member Countries need firm foundation in coastal communities and local levels of governance of natural resources utilization to ensure effective co-management arrangements between the local government and the communities. This has to be coupled with capacity building of communities and local organizations on participatory, inter-disciplinary and community-based strategies in community organization as well as the transfer and adoption of knowledge-based coastal resources management and adoption of sustainable resource use technologies and practices.

People participatory approach will be adopted as the fundamental approach for implementing the project. Specifically, the people participatory approach in community-based fisheries management (CBFM) and co-management (CM) will be used as tools in establishing community fisheries organizations and governance. The community fisheries organizations will take the leading role in community development and management of the coastal resources through the adoption of top-down and bottom-up approaches. In considering the bottom-up approach, community fisheries organizations will be self-formulated to implement their own community development and coastal resource management plans. Following the top-down approach, the community fisheries organizations will also adopt the community development and coastal resource management plans and programs formulated by local governments and higher level authorities.

4. Objective and success criteria

a. Objectives

This section of the Project Document, the highest element in the logical framework, should present the best approach as (1) the statement of the results to be achieved by the project or activity (the objective); and (2) the statement of criteria for successful achievement (the success criteria). In other words, the objective should define a desired solution to the identified problem.

The project aims to formulate a practical framework for strengthening and promoting community fisheries and building the capacity of the fishing communities to enable them to organize community economic development activities and sustain their livelihoods in fisheries. Community fisheries organization is a basic and crucial local management body that could lead and function in the promotion livelihood opportunities in fisheries and management of the coastal resource in sustainable and effective ways. Therefore under this project, such community fisheries organizations would be promoted to also take the role as local coordinators for across-sectors'' communications among the concerned stakeholders. Such function is fundamental and important to implement the top-down and bottom-up approaches in supporting sustainable livelihood and coastal resource management.

1. Establishment of sustainable livelihood opportunities and promotion of coastal resource management particularly in the region's Muslim fishing communities;
2. Poverty reduction in fishing communities for food security through promotion of responsible fisheries and coastal aquaculture that is friendly to the environment; and
3. Strengthening of the community fisheries organizations in the region's Muslim fishing communities by providing opportunities for community economic development and coastal resource management.

b. Success Indicators

The success criteria will set the *qualitative* standards for successful achievement. These criteria will be the measurement of the extent of project success. Such measurement will enable the evaluation of the project in terms of the purpose for which it was formulated.

Success criteria can be mainly on the participation of the fishery communities in the activities and its impact on their livelihoods as well as enhance capacity of fishers, and extend to both government and non-government co-operation in ASEAN Member Countries. As the effective implementation of people participatory approach in community-based fisheries management (CBFM) and co-management (CM) at the local level, the firm local governance and institutions can be established to sustain the resource utilization and reduce conflict among resource users. Promote people's participation in organizing community fisheries organizations will be the key to achieve communities'' resilience and improvement of livelihoods and coastal resource management. These are especially the participating countries which propose to host the on-site activities. In addition, adoption of technology/initiatives by respective Member Countries, which may lead to strengthening of linkage and working mechanism for local institutions and government, can also be used as a success criterion. The above criteria are parts



and puzzles in the long-term achievement improvement of people livelihoods as well as coastal fisheries resources utilization and management in Muslim communities.

c. Success Measures

The success criteria will set the *quantitative* standards for successful achievement. These criteria will enable the measurement of the extent of project success. Such measurement will enable the evaluation of the project in terms of the purpose for which it was formulated.

Enhancing of community resilience and improving livelihoods would be difficult to measure in term of quantity or calculate a monetary value in reality. However, focusing on participatory approach applying in this project could count on the number of people involved in all level of activities under this project.

5. Outputs

Outputs are results or products that are produced and utilized in order to achieve an objective. Several outputs may be necessary to enable the achievement of an objective. The vocabulary chosen to define outputs should describe finished products or completed results, *e.g.*, "a feasibility study" or "trained personnel". This section should list and briefly describe the outputs to be produced for the achievement of each project objective.

The following outcomes are envisaged through the project activities:

1. The region's Muslim fishing communities and other stakeholders undertaking sustainable livelihood activities in fisheries and adopting sustainable coastal resource management;
2. The way of life of local people in fishing communities improved and food security specifically in terms of food supply and job opportunities enhanced while the coastal environment is protected and conserved; and
3. The community fisheries organizations strongly leading the practice of planning and implementing community economic development activities for sustainable livelihood and functioning well specifically in the area of coastal resource management.

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

See Appendix 1-1

6. Indicative work plan

The indicative work plan should be prepared using scheduling software. This work plan should identify and graphically illustrate the activities in the logical order that is necessary for the production of each output. The vocabulary of activities should describe actions, *e.g.*, "implementation of training" or "consultations with Member Countries" customs departments". ASEAN cooperation often deals with similar outputs. Therefore, the activity lists for common outputs can be based on some standard models.

See Appendix 1-2

7. Management and implementation arrangements

a. Management arrangements

The management arrangements should identify the project's Sponsoring ASEAN Body, *e.g.*, "the Committee on Social Development" or "the working group on non-tariff barriers". That body has the responsibility to designate a manager for the project who will be responsible for the achievement of the project objectives. The project manager must see that the planned work is actually done and that finished work actually achieves the objective. The management arrangements should specify to whom the project manager must report and with which other ASEAN bodies he/she must coordinate the project's work.

The ASEAN Sectoral Working Group on Fisheries (ASWGFi) will be designated as a manager for the project.

The project management and administration will comprise two levels (project-level and site-level managements) and two stages (preparation and implementation stages). At project-level management, SEAFDEC, local government officials and local stakeholders representing Malaysia, Indonesia and Brunei Darussalam will be nominated as members of the project steering committee. Representatives from the Philippines, Thailand and Cambodia may also be nominated as members of the steering committee.

The steering committee will look at the possibility of implementing project activities in their respective countries. The steering committee may convene an inception meeting during the preparation stage of the project in order to confirm and finalize the project site selection. During the implementation stage, the steering committee may convene regular meetings at least twice a year to monitor the logistics and progress of the project implementation. At site-level management, the selected countries may establish an implementing committee to assist the steering committee in the implementation of the project action plan. During the implementing stage, the implementing committee may convene quarterly meetings (four times a year).

b. Implementation arrangements

The implementation arrangements define the organizational unit or the personnel who will actually produce the project's outputs. The implementers, who may be consultants, experts or personnel of ASEAN Governments or the Secretariat should be identified for each output. Reporting requirements and relationships should be explained as an element of the implementation arrangements. To ensure full understanding of roles and responsibilities, the project manager should identify "parties responsible" for implementation of each activity when he/she revises the indicative work plan into the actual work plan after project approval.

SEAFDEC is an inter-governmental organization specialized in fisheries through providing technical supports to the ASEAN Member Countries in the field of training, research and information dissemination for over 40 years. It has accumulated its competence in various fields of fisheries including management, assessment of aquatic fisheries resources, capture fisheries, aquaculture and fishery post-harvest development. ASEAN and SEAFDEC have so far continued its strong collaboration in the field of fisheries to secure sustainable fish supply for food security for each ASEAN Member Country. SEAFDEC will therefore be an executing agency for this project.

The SEAFDEC shall be responsible for implementing the Project with due diligence and efficiency, in accordance with the Project Proposal attached and the Budget approved by the ASEAN Secretariat and the Islamic Development Bank (IDB), and with any supplementary arrangement which may be agreed between the Parties. SEAFDEC shall provide technical assistance through organization's human resources within our competent and further collaborate with relevant national and regional experts to accomplish the project activities.

Name of Institution: Southeast Asian Fisheries Development Center
Secretariat
Suraswadi Building
Kasetsart University Campus
P.O. Box 1046 Kasetsart Post Office
Bangkok 10903, Thailand
Tel: +662-940-6326
Fax: +662-940-6336

The project will be coordinated by:

Mr. Somnuk Pornpatimakorn, Administration and Finance Coordinator, and
Mr. Somboon Siriraksophon, Policy and Program Coordinator



The project will be jointly implemented by SEAFDEC and its Departments with the appropriate inputs based on the respective competent developed by these Departments.

c. Monitoring and Evaluation Arrangements

Describe the evaluation strategy for this project, including when the review/evaluation is to take place, the key evaluation issues to be addressed, and how it is to be financed. (It is recommended that the project budget include an allocation for the review/evaluation.)

A performance evaluation report on enhancing coastal community resilience activities will be considered as the project final report reflecting the outcomes of the individual project activities and overall evaluation of the project.

8. Inputs

There may be many possible combinations of inputs that can produce the proposed outputs. The formulator of the Project Document should seek to identify inputs that will enable efficient project implementation, that are appropriate to the work to be done, and that are cost effective. As an aid to the determination of inputs, the project formulator should refer to the indicative work plan. The questions that project formulators need to consider in regard to the selection of inputs include:

- Which inputs should be used?
- What kind of inputs?
- How many? (for consultants or equipment)
- What duration? (for personnel assignments)
- How much does it cost?

Major inputs required for the production of each output should be presented on a table. This table can be created using word processing or spreadsheet software. The purpose of the table is to facilitate the selection of appropriate inputs and to enable project implementers and appraisers to easily understand the relationships between inputs and outputs. The table should describe inputs in five categories: contracted personnel, contracted organizations, equipment, supplies and services, and travel and per diem. Additional details, such as TOR for contracts, should be provided and attached as annexes.

Project Activities:

Activity 1: Community surveys and needs assessment

The main objective of this activity is to establish an overview of the traditional community information and scientific database in order to formulate appropriate action plan and activities for sustainable management of the coastal resources and livelihoods in fisheries. Three basic methods will be used, namely: 1) regular conduct of data collection and special topic surveys; 2) using the survey results to set up and prioritize activities that include technology transfer and human resource development; 3) dissemination of survey results to community fisheries organizations through community meetings, extension programs and services. Special topics of the surveys will focus on social, economic, administrative and environmental aspects to assess the capacity, problems and needs of the fishing communities. The participation of community stakeholders in planning and designing the surveys will be promoted. At the project activities planning, the issue on prevention of coastal fisheries community from natural disaster will be also taken into account.

Activity 2: Development of fisheries governance on coastal management

This activity aims to develop the capacity of the local resource users and stakeholders in community fisheries organizations and institutions for coastal resource management applying the well-documented concept of fisheries management. This activity is also intended to strengthen existing institutions of people's groups or organizations in developing community economics and coastal resource management plans. The community fisheries organizations will take the leading role in promoting food

security in terms of sufficient fish food supply, various job opportunities and environment-friendly coastal protection activities as well as identification of areas for research and development of simple early warning system for natural disasters. A strategic plan for this activity is the conduct of community fisheries meetings on regular basis to discuss and make decisions as well as exchange information. Training and capacity building activities related to community fisheries organization and institution will be provided to stakeholders concerned. The extension programs and services are aimed to assist the community fisheries organizations and stakeholders in self-managing the coastal resources within their own boundaries and in developing alternative livelihoods.

Activity 3: Contribution of community fisheries to sustainable livelihood

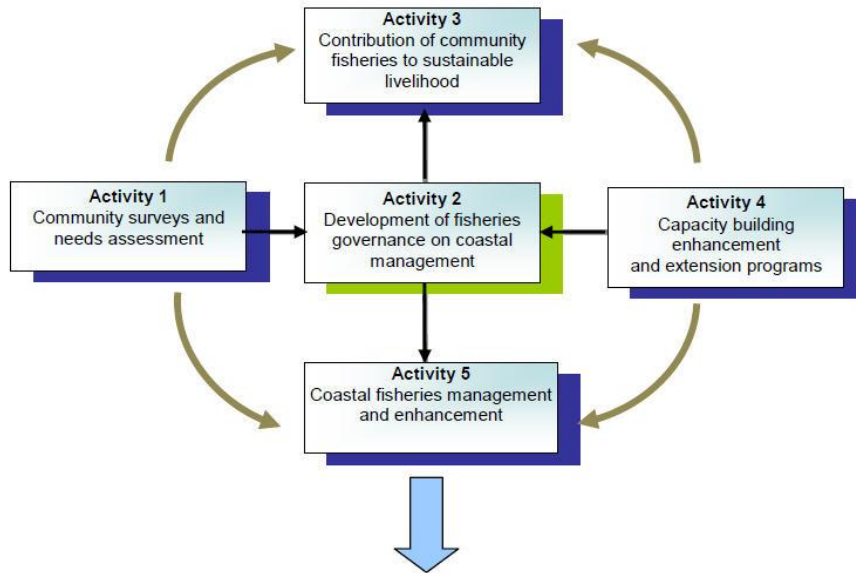
This activity aims to secure means of fisheries livelihood in fishing communities as well as to increase incomes and provide job opportunities particularly outside the fisheries sector. Three strategies will be adopted, namely: fisheries post-harvest technology transfer, responsible fisheries and environment-friendly aquaculture, and recreation fishing. Fisheries post-harvest technology transfer will be conducted through training activities in order to improve the traditional knowledge of women and sanitation in producing community fishery products. This is envisaged to develop and strengthen the capability of women in fishing communities individually and at the organizational level, for the establishment of local community business ventures. Responsible fisheries and environment-friendly aquaculture will be promoted as means of sustainable livelihoods in fisheries. Recreation fishing will also be promoted as possible alternative job opportunities in eco-tourism in the fishing communities.

Activity 4: Capacity building enhancement and extension programs

This activity is intended to enhance the capacity of resource users and stakeholders to be able to actively participate in coastal resource management, sustainable livelihoods development, through a series of training courses and extension programs by strengthening and building upon the traditional awareness and knowledge of the resource users and stakeholders on coastal resource management. Their capacity in developing local business ventures and income-generating activities as well as in financial management will be enhanced. Lessons and experiences gained will be compiled and published as guidelines, manuals and other information formats for dissemination. In addition, the activities will also extend to cope with adaptive to the impacts of climate change and build people's capacity to reduce the vulnerability due to natural disasters. The coastal community should understand and aware of potential impacts of climate change on the coastal environments and able to reduce the risk of their life and livelihoods, this can promote through extension programs and training activities, which the issues cover education on impacts of climate change, training on safety at sea for small-scale fishermen, development of simple early warning system for coastal community, etc.

Activity 5: Coastal fisheries management and enhancement

This activity, which emphasizes on the resilience of coastal resources, aims to enhance and rehabilitate the aquatic resources, habitats and sanctuaries through the traditional fisheries management practices and modern fishing technologies. Resource users and stakeholders will be encouraged to actively participate in fish releasing and installation of fish aggregating devices. Fish releasing will consider the species' economic and conservation aspects, and will be conducted at the right season and in appropriate fishing grounds. Fisheries management practices and fish aggregating devices installation will be implemented based on traditional and scientific knowledge, technology and information. Resource users and stakeholders will be encouraged to take the leading role in the enforcement of rules and regulations based national fisheries laws to strengthen their functions in coastal resource management and enhancement.



Project Goal

1. Establishment of sustainable livelihood opportunities and coastal resource management particularly in the region’s Muslim fishing communities;
2. Poverty reduction in fishing communities for food security through promotion of responsible fisheries and coastal aquaculture friendly to the environment; and
3. Strengthening of community fisheries organizations in the region’s Muslim fishing communities for community economic development and coastal resource management

As the core activity of the project, Activity 2 intends to promote people’s participation in organizing community fisheries organizations based on community-based fisheries management and co-management approaches, and take the main role in fisheries governance on coastal resource management. While Activity 3 mainly supports creating job opportunities and employment for the local stakeholders particularly the women and youth in the fishing communities, Activity 5 aims to enhance and rehabilitate the aquatic resources, habitats and sanctuaries, as primary steps in coastal resource management. The community fisheries organizations established in Activity 2 will take the role of managing Activities 3 and 5 with Activity 1 and Activity 4 supporting Activities 2, 3 and 5.

Results from research and surveys (Activity 1) will be used to determine the capacity and needs for community development and resource management as well as to design the action plan and appropriate project activities. Training and extension programs in Activity 4 for capacity building of the local stakeholders, will be developed based on the results of the surveys. The implementation of the five activities will be prioritized based on local people’s needs and the project annual action plan.

9. Budget and funding arrangements (This section needs further consultation with ASEAN/SEC and IDB)

The selected inputs and their costs are consolidated on a project budget which should be presented on a spreadsheet under the following headings: contracts (individual, corporate or institutional); equipment; supplies and services; travel and daily subsistence allowance (not related to contracts). If more than one funding source is proposed, a budget should be prepared for each one.

The project is co-funded by Islamic Development Bank (IDB) in cash through ASEAN Secretariat, SEAFDEC in kind including the mobilization of technical staff and use of facilities and services possessed by SEAFDEC Departments and ASEAN Member Countries in kind including mobilization of technical staff as well as existing system to achieve the project objectives. Total budget is estimated in Appendix 1-3.

Attachments

The attachments listed and described below should be appended to the Project Document as necessary or appropriate.

a. Mobilization Plan.

A plan should be prepared that describes how the project will be activated once it is approved. The preparation of this plan is especially important when the finalization of funding arrangements remains to be done. This plan could also include the designation of the project manager and any other steps that must be taken to enable the project manager to initiate implementation of the project.

b. Explanation of Budget Estimates.

This attachment should explain how budget estimates were determined for major inputs. In many cases, this attachment may simply refer to ASEAN pro forma figures for budgeting. Otherwise, supporting information should explain how budget figures were calculated.

c. Terms of Reference (TOR) for Contracts.

In the event that important elements of the project will be done on a contractual basis, the TOR should be prepared in draft as attachments. Contracts can be for individuals, firms, non- governmental organizations or other institutions. The format and instructions for the preparation of TOR for contracts provided in Form APDM/TOR.

d. Specifications for equipment.

An attachment should be prepared with the specifications for any equipment item over \$10,000 in value or for multiple purchases of a smaller item whose aggregate value exceeds \$10,000.

e. Other Attachments.

Other attachments may be provided in order to explain or clarify the Project Document. These might include explanatory technical data or a bibliography. Such additional attachments are not mandatory and should be prepared only if deemed essential for understanding of the Project Document by appraisers or potential funding agencies.

Review

The project proponent should review the draft project document for (1) clarity of the logical connections among elements of the project; (2) completeness, according the requirements of the project document format; and (3) correctness (facts, grammar, and spelling). The first draft of the Project Document should be circulated for substantive comments within the concerned ASEAN body and revised accordingly before submission to the Coordinator Unit (PCU) for appraisal and further processing.

Appendix 1 of Annex 1 Log Frame on Project Follow-up, Monitoring and Evaluation:

Expected output	Indicators	Source of verification	Risks
1. the targeted fishing communities and other stakeholders undertaking sustainable livelihood activities in fisheries and adopting sustainable coastal resource management	- 30 % of total households - 5 sustainable livelihood activities both fisheries and non-fisheries sectors	- District or Provincial annual reports - result of base line survey - result of workshop	- natural disaster - limitation of local resources - poor infrastructure
2. the way of life of local people in fishing communities improved and food security specifically in terms of food supply and job opportunities while the coastal environment is protected and conserved	-30% of total households -30% of total households income increases higher than national poverty line - 20% of total households have alternative job	- national and provincial economic report - district or provincial annual reports - result of base line survey - result of workshop	- natural disaster - change of poverty line
3.the community fisheries organizations strongly leading the practice of planning and implementing community economic development activities for sustainable livelihood and functioning well specifically in the area of coastal resource management	- 20% of total households enable designed community plan - 30% of total households function in the area of coastal resource management - 4 main types of people group or organization such as women, savings, fisheries and consumer /store	- District or Provincial annual reports - result of base line survey - result of workshop	- different group interest - limitation of people's participation and society
Activity	Indicators	Indicators	Risks
Activity 1 community survey and need assessment			
1.Need assessment			
1.1 community development and coastal resource management	list of problems, need and priority	- District or Provincial annual reports	- limitation of stakeholder concerned and participation
1.2 fisheries governance development and management	list of people's organization, institution, group, and list of activities	- District or Provincial annual reports	- out of date of the report
Community survey			
1.3 base line survey	30% of total local residence	- District or Provincial annual reports	- out of date report and data -lack of local residence participation in the survey
1.4 fish marketing survey	list of fish trader and marketing channels diagram	- District or Provincial annual reports	- out of date report and data
1.5 impacts of climate change/natural disaster	List of impacts and destruction reduction	- District or Provincial annual reports	- limitation of official and agency concerned - loss of record

Monitoring & Survey			
1.6 monitoring and evaluation survey on project implementation and termination	50% of local residence participated in project enabling to practice as three main expected output	- national and provincial economic report - district or provincial annual reports - result of base line survey - result of workshop	- out of date report and data
Activity 2 development of fisheries governance on coastal management			
2.1 regular meeting of community fisheries organization and development	85% of local residence attended the meeting receiving knowledge and information.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
2.2 a meeting on discussing and planning on coastal resource management formulation by community fisheries organization	50% of local residence participated in the meeting are able to design community plan coupled with activities.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
2.3 a meeting on plan and activity of local stakeholder participating in community development on voluntary and business basis	Community plan and activities both voluntary and credible performing business activities for implementation.	- district master plan - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
2.4 <i>ad hoc</i> meeting for special issue and activities	List of activities setting up for deal with special issues.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
Activity 3 contribution of community fisheries on sustainable livelihood			
3.1 A workshop on identifying possible approaches to improve community livelihood for women's group and fisher's group	95% of women and fishers participated in the workshop gained skill of SWOT analysis to improve community livelihoods.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- poor women and fishers participation
3.2 Promotion of various fisheries products and micro credit schemes	50% of local residence received and practiced knowledge on creating and improving fisheries products and micro credit system.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
	10% of community products from fisheries and non-fisheries.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record	- limitation of local resources - poor infrastructure - poor contribution

		related to	
	50% of local residence particular women would recognize earning income.	<ul style="list-style-type: none"> - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to 	<ul style="list-style-type: none"> - out of date of report - limitation of society
3.3 Promotion of coastal aquaculture, cage culture and shell culture	20% of local residence carry out aquaculture activities	<ul style="list-style-type: none"> - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to 	<ul style="list-style-type: none"> - limitation of local resources - poor infrastructure - poor contribution
3.4 Promotion of eco-tourism fishing sport and home stay	5% of local residence carry out eco-tourism activities	<ul style="list-style-type: none"> - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to 	<ul style="list-style-type: none"> - limitation of local resources - poor infrastructure - poor contribution
3.5 Promotion of consumer/store cooperative /group	60% of local residence benefit from the activities	- Report of the cooperative/ group	- poor system and management
Activity 4 capacity building enhancement and extension program			
Training arrangement			
4.1 the orientation of community fisheries organization function and responsibility	50% of local residence participated in the activity	<ul style="list-style-type: none"> - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to 	- limitation of stakeholder concerned and participation
4.2 develop community leaders, religious leaders and stakeholders in management and organization of community fisheries	50% of local residence participated in the activity	<ul style="list-style-type: none"> - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to 	- limitation of stakeholder concerned and participation
4.3 develop women and youth in fishing communities on community development and coastal management	50% of local residence participated in the activity	<ul style="list-style-type: none"> - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to 	- limitation of stakeholder concerned and participation
4.5 capacity building of income and financial management	50% of local residence participated in the activity	<ul style="list-style-type: none"> - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to 	- limitation of stakeholder concerned and participation

Extension program			
4.6 capacity building on responsible fisheries practice and modern fishing technologies	50% of local residence participated in the activity	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to - project report	- limitation of stakeholder concerned and participation
4.7 capacity building to reduce vulnerability from climate change /natural disaster	50% of local residence participated in the activity	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to - project report	- limitation of stakeholder concerned and participation
4.8 coastal resource restoration based on the findings of the surveys	50% of local residence participated in the activity	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to - project report	- limitation of stakeholder concerned and participation - limitation of society
4.9 provision of information on community development and coastal resource management through printed materials and local wired announcement (if available)	50% of local residence participated in the activity	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to - project report	- illiteracy - limitation of stakeholder concerned and participation
4.10 coordination with religious leaders and community leaders on logistic works and project implementation	50% of coordinated activity accomplished	-community report and record -project report	- limitation of stakeholder concerned and participation - limitation of society
Activity 5 coastal fisheries management and enhancement			
5.1 aquatic resources and habitat enhancement and rehabilitation through traditional fisheries management practice	1 % of total areas of the habitat such as mangrove forests	- Dept. of Forestry's report - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- natural disaster - limitation of geographic factors - limitation of stakeholder concerned and participation
5.2 promotion of fish releasing and fish aggregating device installation	20% of fishers access and benefit	- Dept. of Fisheries - district or provincial annual reports -result of base line survey - result of workshop - other report or record related	- natural disaster - limitation of stakeholder concerned and participation
5.3 enforcement of rules and regulation on new habitat improvement	20% of fishers respected to rules and regulations	- Dept of Fisheries - district or provincial annual reports	- natural disaster - limitation of geographic factors



tools by resource users and stakeholders		<ul style="list-style-type: none"> - result of base line survey - result of workshop - other report or record related to 	- limitation of stakeholder concerned and participation
	1% of coastal areas has no interruption	<ul style="list-style-type: none"> - Dept of Fisheries - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to 	- natural disaster participation
6.Project evaluation and reporting	<ul style="list-style-type: none"> 30 % of total households -5 sustainable livelihood activities both fisheries and non-fisheries sectors -30% of total households income increases higher than national poverty line -20% of total households have alternative job - 20% of total households enable designed community plan -30% of total households function in the area of coastal resource management -4 main types of people group or organization such as women, savings, fisheries and consumer /store cooperative 	<ul style="list-style-type: none"> - national and provincial economic report - district or provincial annual reports - result of base line survey - result of workshop 	<ul style="list-style-type: none"> - natural disaster - change of poverty line

PROPOSED INDICATIVE WORK PLAN

Project Activity	1 st Year				2 nd Year				3 rd Year			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Community survey and needs assessment 1) Community development and coastal resource management 2) Fisheries governance development and management 3) Baseline survey 4) Fish marketing surveys 5) Impacts of climate change/natural disasters surveys 6) Monitoring and evaluation surveys on project implementation and upon termination	X	X										
2. Development of fisheries governance on coastal management 1) Problem-solving and situation analysis with involvement of former and/or newly established community fisheries organizations 2) Formulation of plans and activities on coastal resource management and sustainable livelihood with participation of community fisheries organizations 3) Support for the functions and networking of community fisheries organizations in the area of conflict management 4) <i>Ad hoc</i> meeting for special issues and activities			X	X								
3. Contribution of community fisheries to sustainable livelihood 1) Workshop on identifying possible approaches to improve community livelihoods for women's groups and fisher groups 2) Promotion of various fisheries products and micro credit schemes 3) Promotion of coastal aquaculture, cage culture and shell culture 4) Promotion of eco-tourism, sports fishing and home stay 5) Promotion of cooperative dry goods grocery store					X	X	X	X				
4. Capacity building enhancement and extension program 1) Orientation on community fisheries organization functions and responsibilities 2) Develop the community leaders, religious leaders and stakeholders in management and organization of community fisheries 3) Develop women and youth in fishing communities on community development and coastal management 4) Promotion of fish marketing and product development					X	X	X	X	X	X		



Project Activity	1 st Year				2 nd Year				3 rd Year			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
5) Capacity building for increased income and financial management												
6) Capacity building on responsible fisheries practice and modern fishing technologies												
7) Capacity building to reduce vulnerability from climate change/natural disasters												
8) Coastal resource restoration based on the findings of the surveys					X	X	X	X	X	X		
9) Provision of information on community development and coastal resource management through printed materials and local wired announcements (if available)												
10) Coordination with religious leaders and community leaders on logistic works and project implementation												
5. Coastal fisheries management and enhancement												
1) Aquatic resources and habitat enhancement and rehabilitation through traditional fisheries management and practices												
2) Promotion of fish releasing and fish aggregating device installation			X	X	X	X	X	X	X	X		
3) Enforcement of rules and regulations on new habitat improvement tools by resource users and stakeholders												
6. Project Evaluation and Reporting											X	X

Appendix 3 of Annex 8

PRELIMINARY COST ESTIMATE

Categories	Year 1	Year 2	Year 3
1) Activity 1: Community survey and needs assessment	10,000	10,000	10,000
2) Activity 2: Development of fisheries governance on coastal management	12,000	25,000	20,000
3) Activity 3: Contribution of community fisheries to sustainable livelihood	10,000	35,000	20,000
4) Activity 4: Capacity building enhancement and extension program	12,000	20,000	20,000
5) Activity 5: Coastal fisheries management and enhancement	10,000	30,000	15,000
6) Administrative	5,000	5,000	5,000
Sub-total	59,000	125,000	90,000
Contingency (10%)	5,900	12,500	9,000
Total	64,900	137,500	99,000
Total Proposed Budget			301,400

Estimated Budget Year 1

EXPENDITURE	ACT 1	ACT 2	ACT 3	ACT 4	ACT 5	BUDGET
Travel Cost	1,920	1,920	1,920	1,920	1,920	9,600
SEAFDEC staff (Per diem)	1,440	1,440	1,440	1,440	1,440	7,200
Local staff (per diem)	720	720	720	720	720	3,600
Consultants	200	200	1,000	200	200	1,800
Invited Travel Cost	200	200	200	200	200	1,000
Meeting Cost	320	3,000	-	1,000	1000	5,320
Communications	200	200	200	200	200	1,000
Publications and Stationery	200	600	650	1,000	120	2,570
Supplies and Materials	300	1,800	1650	120	-	3,870
Survey Expenses	3,000	-	-	-	-	3,000
Training Expenses	-	-	2,000	2,500	3000	7,500
Workshop	1,100	520	-	1,500	-	3,120
Transportation	400	1,000	220	1,200	200	3,020
Furniture and Equipment	0	400	0	0	1000	1,400
Sub-total	10,000	12,000	10,000	12,000	10,000	54,000
Administrative	1000	1000	1000	1000	1000	5,000
Contingency (10%)	1000	1200	1000	1200	1000	5400
Contingency (10%) of administrative	100	100	100	100	100	500
Total	12,100	14,300	12,100	14,300	12,100	64,900

Estimated Budget Year 2

EXPENDITURE	ACT 1	ACT 2	ACT 3	ACT 4	ACT 5	BUDGET
Travel Cost	1,920	1,920	1,920	1,920	1,920	9,600
SEAFDEC staff (Per diem)	1,440	1,440	1,440	1,440	1,440	7,200
Local staff (per diem)	720	720	720	720	720	3,600
Consultants	200	200	200	200	200	1,000
Invited Travel Cost	-	200	200	200	200	800
Meeting Cost	-	2,000	1,000	1,000	-	4,000
Communications	200	200	200	200	200	1,000
Publications and Stationery	100	1,000	1,000	1,000	1,000	4,100
Supplies and Materials	-	1,320	1,000	120	8,000	10,440
Survey Expenses	3,220	-	-	-	-	3,220
Training Expenses	-	10,000	20,000	7,500	6,000	41,000
Workshop	-	3,000	2,000	2,500	6,000	11,000
Transportation	1,200	1,800	2,320	1,200	1,320	7,840
Furniture and Equipment	1,000	1,200	3,000	2,000	3,000	10,200
Sub-total	10,000	25,000	35,000	20,000	30,000	115,000
Administrative	1000	1000	1000	1000	1000	5,000
Contingency (10%)	1,000	2,500	3,500	2,000	2,500	11,500
Contingency (10%) of administrative	100	100	100	100	100	500
Total	12,100	28,600	39,600	23,100	33,600	137,000

Estimated Budget Year 3

EXPENDITURE	ACT 1	ACT 2	ACT 3	ACT 4	ACT 5	BUDGET
Travel Cost	1,920	1,920	1,920	1,920	1,920	9,600
SEAFDEC staff (Per diem)	1,440	1,440	1,440	1,440	1,440	7,200
Local staff (per diem)	720	720	720	720	720	3,600
Consultants	200	200	200	200	200	1,000
Invited Travel Cost	-	200	200	200	200	800
Meeting Cost	-	2,000	1,000	1,000	-	4,000
Communications	200	200	200	200	200	1,000
Publications and Stationery	100	700	420	1,000	620	2,840
Supplies and Materials	-	1,000	1,000	120	500	2,620
Survey Expenses	3,220	-	-	-	-	3,220
Training Expenses	-	6,120	5,000	7,500	4,000	17,620
Workshop	-	4,000	4,000	2,500	4,500	6,000
Transportation	1,200	1,000	2,000	1,200	350	4,750
Furniture and Equipment	1,000	500	1900	2,000	350	4,750
Sub-total	10,000	20,000	20,000	20,000	15,000	85,000
Administrative	1000	1000	1000	1000	1000	5,000
Contingency (10%)	1,000	2,000	2,000	2,000	1,500	8,500
Contingency (10%) of administrative	100	100	100	100	100	500
Total	12,100	23,100	23,100	23,100	17,600	99,000



PROJECT IDENTIFICATION FORM (PIF)¹
PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND: GEF Trust Fund

PART I: PROJECT IDENTIFICATION

Project Title:	Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand		
Country(ies):	Cambodia, Indonesia, Philippines, Thailand, and Viet Nam	GEF Project ID: ²	
GEF Agency(ies):	UNEP (select) (select)	GEF Agency Project ID:	00829
Other Executing Partner(s):	Departments of Fisheries in the participating countries; Southeast Asian Fisheries Development Center (SEAFDEC)	Submission Date:	31 October 2012
GEF Focal Area (s):	International Waters	Project Duration (Months)	48
Name of parent program (if applicable): - For SFM/REDD+	N/A	Agency Fee (\$):	285,000

A. FOCAL AREA STRATEGY FRAMEWORK³:

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-financing (\$)
IW-2 (select)	Outcome 2.1: Implementation of agreed Strategic Action Programmes (SAPs) incorporates ecosystem-based approaches to management of LMEs, ICM principles, and policy/legal/institutional reforms into national/local plans	1. National and local policy/legal/institutional reforms adopted	GEFTF	1,000,000	4,000,000
IW-2 (select)	Outcome 2.3: Innovative solutions implemented for reduced pollution, rebuilding or protecting fish stocks with rights-based management, ICM, habitat (blue forest) restoration/conservation, and port management and produce measureable results	4. Types of technologies and measures implemented in local demonstrations and investments	GEFTF	1,550,000	6,200,000
IW-3 (select)	Outcome 3.3: IW portfolio capacity and performance enhanced from active learning/KM/experience sharing	3. Active experience /sharing/ learning practiced in the IW portfolio	GEFTF	300,000	1,200,000
(select) (select)			GEFTF		
(select) (select)			GEFTF		
(select) (select)			GEFTF		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)	Others		(select)		
Sub-Total				2,850,000	11,400,000
Project Management Cost ⁴			GEFTF	150,000	600,000
Total Project Cost				3,000,000	12,000,000

¹ It is very important to consult the PIF preparation guidelines when completing this template.

² Project ID number will be assigned by GEFSEC.

³ Refer to the reference attached on the Focal Area Results Framework when filling up the table in item A.

⁴ GEF will finance management cost that is solely linked to GEF financing of the project.



B. PROJECT FRAMEWORK

Project Objective: To operate and expand the network of fisheries refugia in the South China Sea and Gulf of Thailand for the improved management of fisheries and critical marine habitats linkages in order to achieve the medium and longer-term goals of the fisheries component of the Strategic Action Programme for the South China Sea.						
Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Cofinancing (\$)
1. Identification and Management of Fisheries and Critical Habitat Linkages in the South China Sea and Gulf of Thailand	TA	<p>1.1 Effective operation of the regional system of fisheries refugia for the management of priority, transboundary, fish stocks and endangered species, including: boundaries for 14 refugia sites delineated</p> <p>1.2 implementation of fisheries management systems in 14 fisheries refugia that are consistent with the FAO Code of Conduct for Responsible Fisheries and the Regional Guidelines for Responsible Fisheries in Southeast Asia</p> <p>1.3 fishing communities, particularly artisanal fishermen and women involved in inshore gleaning and processing, empowered to enforce agreed management rules in the fisheries refugia.</p>	<p>1) Maps and site characterizations for 14 fisheries refugia sites and additional 9 known fish spawning and nursery areas</p> <p>2) Fisheries management plans for 14 refugia sites</p> <p>3) Management team and community-based volunteer network at each site</p> <p>4) 5 national and 1 regional fisheries and biodiversity conservation databases, including: status of priority fish, crustacean, and mollusc species; distribution and abundance of fish eggs and larvae; and location and management status of coastal habitats, fisheries refugia, MPAs, and critical habitats for threatened and endangered species.</p>	GEFTF	1,150,000	4,600,000
2. Improving the Management of Critical Habitats for Fish Stocks of Transboundary Significance	TA	<p>2.1 Improved integration of habitat and biodiversity conservation considerations in the management of fisheries in the South China Sea and Gulf of Thailand, including: enhanced scientific understanding of fish stock and habitat links; and endorsement by Ministers of Fisheries of policy and regulatory frameworks governing the fisheries sector that incorporate measures for sustainable use of fish habitats and biodiversity</p> <p>2.2 reduced use of destructive fishing gear and practices in areas of critical fisheries habitats.</p>	<p>1) Regional model of fish egg and larvae distribution</p> <p>2) Regional and site level models of ecosystem carrying capacity and sustainable fishing effort levels by fishing gear type</p> <p>3) 5 national reports on legal/institutional aspects of refugia</p> <p>4) 5 sets of national guidelines for establishing and operating refugia</p> <p>5) 100 quarterly national reports on fish stocks and habitats</p> <p>6) 5 national reports on, and regulations/ordinances for, use of responsible fishing gear and practices in priority refugia</p> <p>7) 1 regional and 5 national action plans for management of priority fisheries refugia and associated biodiversity.</p>	GEFTF	1,200,000	4,800,000

3. Information Management and Dissemination	TA	3.1 Enhanced uptake of good practices in integrating fisheries management and biodiversity conservation in the design and implementation of regional and national fisheries management systems 3.2 Improved community acceptance and cost-effectiveness of area based approaches to marine management 3.3 Compiled knowledge and experiences about the project shared with other GEF projects and GEF Sec, and available on IW:LEARN [1% of GEF IWs grant]	1) Regional education and awareness centre on links between fisheries, habitats, and biodiversity, and associated regional Information and Education Campaign (IEC) 2) Public awareness and outreach programmes on fish stock – habitat links at 23 sites 3) Report on indicators and standardised methods for information and data collection for refugia management 4) Development of 5 national language web portals on fisheries refugia and maintenance of the regional Fisheries Refugia Information Portal http://refugia.unepscs.org and linked to the International Waters Learn Program (IW: LEARN) 5) Participation at the International Waters conferences; three to four experiences notes and tracked project progress reported using the GEF-V IW tracking tool	GEFTF	500,000	2,000,000	
	(select)			(select)			
	(select)			(select)			
	(select)			(select)			
	(select)			(select)			
	(select)			(select)			
	(select)			(select)			
	(select)			(select)			
Sub-Total						2,850,000	11,400,000
Project Management Cost ⁵				GEFTF	150,000	600,000	
Total Project Costs						3,000,000	12,000,000

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
National Government	Departments of Fisheries in the participating countries	In-kind	2,000,000
National Government	Departments of Fisheries in the participating countries	Grant	1,635,000
Local Government	Participating local authorities in FR sites	In-kind	1,000,000
Other Multilateral Agency (ies)	Southeast Asian Fisheries Development Center (SEAFDEC)	Grant	3,150,000
Other Multilateral Agency (ies)	Southeast Asian Fisheries Development Center (SEAFDEC)	In-kind	3,750,000
GEF Agency	UNEP/DEPI	In-kind	200,000
Bilateral Aid Agency (ies)	TBD	In-kind	265,000
(select)		(select)	
(select)		(select)	
(select)		(select)	
Total Co-financing			12,000,000

⁵ Same as footnote #3.

D. GEF/LDCF/SCCF RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY⁶

GEF Agency	Type of Trust Fund	Focal Area	Country Name/Global	Grant Amount (a)	Agency Fee (b) ⁷	Total c=a+b
UNEP	GEF TF	International Waters	Regional -All participating countries	3,000,000	285,000	3,285,000
(select)	GEF TF	(select)				0
UNIDO	GEF TF	(select)				0
(select)	GEF TF	(select)				0
(select)	GEF TF	(select)				0
(select)	GEF TF	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total Grant Resources				3,000,000	285,000	3,285,000

⁶ In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table

⁷ Please indicate fees related to this project.

PART II: PROJECT JUSTIFICATION

A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

A.1.1 the GEF focal area/LDCF/SCCF strategies:

This proposal is aligned with the GEF-5 International Waters Strategic Priority 2: Catalyze multi-state cooperation to rebuild marine fisheries in the South China Sea and Gulf of Thailand Large marine ecosystems, and specifically outcome 2.1 in implementing the fisheries component of the approved South China Sea Strategic Action Programme (SCS SAP). As outlined in the SCS SAP, the fish *refugia* concept is an innovative approach to reconciling the demands of marine biodiversity with the often conflicting demands for enhanced fisheries products, and therefore the project will contribute significantly to Outcome 2.3. Since this is the first attempt to involve fisheries and environmental managers in jointly managing demersal fish stocks and the marine and coastal habitats upon which these stocks depend, the project will contribute significantly to IW Strategic Priority 3 by focusing on local pilot demonstrations and portfolio learning/shared visions of action and commitments among the SCS countries and agencies. The project will play a catalytic role in addressing transboundary water concerns by assisting countries to restore and sustain coastal and marine fish stocks and associated biodiversity and support policy, legal and institutional reforms and multiagency partnerships that contribute to WSSD targets for sustaining fish stocks.

The project will also indirectly contribute to two GEF-5 Biodiversity Strategic Objectives, namely: Strategic Objective 1 to improve sustainability of Protected Area Systems through improvement of fishing community's livelihoods and revenue using sustainable use approaches to managing fish stocks and critical habitats; and Strategic Objective 2 on Mainstreaming Biodiversity in Production Landscapes/Seascapes and Sectors. By using the innovative concept of fish *refugia*, the project will demonstrate the potential of biodiversity conservation and sustainably managed seascapes for marine fishery production sector. The project will enhance the understanding of the effectiveness of different forms of marine biodiversity protection and how to combine conservation goals with generation of local benefits in the fisheries sector at both the national and regional levels.

A.1.2. For projects funded from LDCF/SCCF: the LDCF/SCCF eligibility criteria and priorities:

- A.2. National strategies and plans or reports and assessments under relevant conventions, if applicable, *i.e.* NAPAS, NAPs, NBSAPs, national communications, TNAs, NIPs, PRSPs, NPFE, etc.:

The FAO Code of Conduct for Responsible Fisheries recognizes that fisheries have the potential to alter the structure, biodiversity, and productivity of marine ecosystems, and recommends that innovative ecosystem-based approaches to fisheries management should be incorporated into existing regional and national fisheries management frameworks where possible. ASEAN and SEAFDEC adopted the “*UNEP/GEF Regional Guidelines on the Use of Fisheries Refugia for Sustainable Capture Fisheries Management in Southeast Asia*” in April 2006, which were published in May 2006, as part of the ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia for the implementation of the FAO Code of Conduct for Responsible Fisheries. In this connection, the 2008 Intergovernmental meeting of the SEAFDEC Council urged SEAFDEC member country governments to develop projects and initiatives aimed at ensuring more ecosystem-based approaches to fisheries management in the region.

During the period 2007-2008, the concept of fisheries *refugia* has been included in the following fisheries policies and plans of partner Member Countries as a priority tool for improved fisheries habitat management: Fisheries Law of Cambodia; South China Sea Fisheries Management Zone Plan in Indonesia; the Comprehensive National Fisheries Industry Development Plan in the Philippines-Thailand's Marine Fisheries Policy-and the National Plan for the Management of Aquatic Species and Habitats in Viet Nam. This represents the first time regional consensus has been reached on how to build the resilience of Southeast Asian fisheries to the effects of high and increasing levels of fishing effort by enhancing the knowledge and capacity amongst stakeholders of ecosystem and fishery linkages, as a basis for integrated fisheries and ecosystem/habitat management.

B. PROJECT OVERVIEW:

B.1. Describe the baseline project and the problem that it seeks to address:

The South China Sea and Gulf of Thailand are located at a global centre of shallow water marine biological diversity. The marine habitats of this area support fisheries that are significant in terms of food security, export income for riparian countries. Critical habitats, such as mangrove swamps, coral reefs, seagrass beds, and estuaries act as nursery areas, spawning grounds, and feeding sites for transboundary species during critical phases of their life-cycles.

Fishing has been identified by the UNEP/GEF Regional Working Groups for the Habitat Sub-Components of the South China Sea Project as a factor contributing to the continued loss of marine habitats and biodiversity in the South China Sea. Southeast Asian fisheries are characterized by high levels of coastal community dependence on fish for food and income, excessive and increasing levels of fishing effort, and diminishing availability of fisheries resources. The small size of vessels which are largely owner operated, and the multitude of landing points and land-based distribution networks poses problems of regulation and control that differ significantly from temperate fleets.

The effects of intensive inshore fishing include: declining availability and biomass of fish species of global and transboundary significance; changes in community structure due to direct reductions of populations representing specific trophic levels of the community (*e.g.* predator or prey); capture mortality of rare and endangered species; large catches of juvenile fish; and the degradation and loss of habitats and associated non-target biodiversity. The widespread use of inappropriate and destructive fishing gear and practices, such as the use of demersal trawls and push nets in seagrass areas, and the use of poisons and explosives to catch fish in coral reef areas, is of increasing concern with respect to the degradation and loss of habitats and biodiversity as a result of fishing. This situation has led to an urgent need for new and innovative fisheries management approaches in the region, particularly those aimed at limiting the loss of habitats and biodiversity, and ensuring the sustainable use of biodiversity by the fisheries sector.

The fisheries *refugia* initiative established under the UNEP/GEF project entitled “Reversing Environmental Degradation in the South China Sea and Gulf of Thailand” is unique in that it represents the first attempt to establish a regional network of integrated fisheries and habitat management areas in Southeast Asia supported by national habitat action plans (NAPs) and fisheries policies. Furthermore, regional fisheries organizations, including the Southeast Asian Fisheries Development Center (SEAFDEC) and FAO’s Asia-Pacific Fisheries Commission (APFIC) have acknowledged the unique role of the multi-lateral, intergovernmental Project “Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand” in building partnerships and enhancing communication between fisheries and environment sectors in the region for the improved management of the environmental aspects of fisheries. Fisheries *refugia* in this context are defined as “spatially and geographically defined, marine or coastal areas in which specific management measures are applied to sustain important species during critical stages of their life cycle, for their sustainable use”, and it is also compatible with FAO’s Ecosystem Approach to Fisheries (EAF).

This project aims to expand the network of fisheries *refugia* in the South China Sea and Gulf of Thailand for the improved management of fisheries and critical marine habitats. Based on the draft SAP and NAPs developed under the South China Sea Project, five (5) participating countries have included establishment and management of fisheries *refugia* in national fisheries policies and plans (Cambodia, Indonesia, Philippines, Thailand, and Viet Nam). All countries have expressed the need for further scientific research, cross sectoral co-ordination, guidelines regarding the process of establishing and managing fisheries *refugia*, and establishment of mechanisms for regional exchange of information and lessons learnt. Key activities described in the Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand project will focus on ensuring adequate cross sectoral consultation between fisheries and environment departments in the designation and management of fisheries refugia. This is particularly important in relation to the designation of Marine Protected Areas by concerned Ministries in each participating country to ensure that such areas are congruent with habitat areas of critical significance to fish stocks. The project will also involve the

establishment of institutional mechanisms to effect the integration of habitat and marine biodiversity conservation considerations into fisheries management.

The decadal rates of decline in total area of critical habitats such as seagrass, coral reefs, and mangroves in the South China Sea and Gulf of Thailand are currently estimated at 30%, 16%, and 16% respectively. Fishing is a contributing factor to the loss and degradation of particularly seagrass and coral reef habitats and the expected outcome of this project of global significance is the reduction in the rates of loss of globally significant habitats and biodiversity in priority fisheries *refugia* due to fishing.

- B. 2. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

There is considerable global concern for the ecosystem effects of fishing, particularly the loss of habitats and coastal and marine biodiversity as a result of fishing. In Southeast Asia this concern is intensified by the fact that most stocks of economically important fish species are considered to be fully fished or overexploited. Increasing global demands for fisheries products; and the dependence of coastal communities on fish for food and income results in a continued increase in fishing effort. This has caused fishing down of the marine food chain in the region, coupled with an increasing dependence of the artisanal sector on small pelagic species due to declining availability of demersal species. Declining fish availability, coupled with over-capacity and the dependence of the small-scale sector on coastal fisheries for income generation has led to the use of destructive fishing practices by some fishermen in order to maintain incomes and food production in the short-term.

An emerging theme from the South China Sea Project is the need for improved management of the key threats to fish stocks and habitats from fishing. The main barriers in reducing the levels of the threats include:

- A. low level understanding amongst stakeholders, including fisherfolk, scientists, policy makers, and fisheries and habitat managers of ecosystem and fishery linkages,
- B. existing low level community acceptance of “protected” area-based approaches to marine management – several past conservation initiatives in the region, particularly those associated with Marine Protected Areas, have promoted the complete closure of areas to fishing which is a futile if not impossible task in Southeast Asia. Such closures have been promoted in terms of potential fisheries benefits, however have often not included fishing communities and managers in the selection and management of areas, limited information regarding fish life-cycle and critical habitat linkages, and the role marine habitats play in sustaining fisheries, and
- C. low level experience in national fisheries/environment departments and ministries in development of integrated approaches to fisheries and habitat management.

By addressing these issues and expanding the use of the fisheries *refugia* approach through the establishment and operational management of a network of fisheries *refugia* sites, the project will result in significant incremental benefit compared to the ‘no action’ option. Anticipated incremental benefits include: demonstration of sustainable use of fish stocks and habitats at fisheries *refugia* sites; improved community acceptance and cost-effectiveness of area based approaches to marine management; establishment of policy and regulatory frameworks governing the fisheries sector that incorporate measures for the sustainable use of fish habitats and biodiversity; and multi-lateral political commitments to enhance cooperation on fish stock and habitat management. It is anticipated that the experiences gained in this region will be suitable for application in other large marine ecosystems such as the Yellow Sea where over-fishing and the use of inappropriate fishing gear are significant impediments to more sustainable exploitation of fish stocks, their habitats, and associated biodiversity.

The project intends to build on existing investments and the policy and scientific basis for the regional system of fisheries *refugia* established through UNEP/GEF South China Sea Project. The development of the fisheries *refugia* concept as a tool for integrating fish stock and habitat management was

undertaken by the UNEP/GEF Regional Working Group on Fisheries in close collaboration with SEAFDEC, FAO, IUCN, and World Fish Center during the period 2003-2008.

The concept was elaborated and refined, and priority *refugia* sites identified, based on: the outcomes of regional and national level expert and fishing community consultations; national reports on fisheries, mangroves, coral reefs, seagrass, and wetlands from the seven participating countries of the South China Sea project; 135 habitat site characterisations prepared during the SCS Project; the SCS meta-database and GIS; and information contributed directly by fisheries and habitat focal points. This has been supported by three regional training courses and 12 national training seminars on the scientific and management aspects of operating the regional *refugia* system.

Cost effectiveness was a key criterion for development of the *refugia* initiative. The concept aims to improve the use of area-based approaches to fish stock and habitat management, whilst overcoming the problems associated with the emphasis on no-take Marine Protected Areas in the region. The latter include low fishing community acceptance, and high costs in terms of displacement of fishermen and enforcement. The fisheries *refugia* initiative addresses the present problems by drawing on fisheries management concepts that are easily understood at the fishing community level and emphasise the sustainable use of fisheries resources and their habitats rather than the prohibition of fishing.

There is consensus amongst the fisheries and habitat specialists of the SCS Project that the *refugia* concept represents an innovative approach for building fishing community support for area-based approaches to fisheries and habitat management, through which fish stock and habitat conservation objectives can be achieved simultaneously. The focus of the project on establishing operational management at 14 priority fisheries *refugia* sites will enable the efficient timing of site level activities required to ensure the transfer of lessons-learned between and amongst sites, and evaluation of the effectiveness of project interventions in achieving the medium and longer term resource and institutional objectives of the *refugia* system.

- B.3. Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF). As a background information, read Mainstreaming Gender at the GEF:

This initiative is considered of significance because of the potential fisheries and biodiversity conservation benefits associated with effective fisheries and habitat management at the local level. Fisheries management leading to sustainable levels of exploitation in the region, due to the importance of fisheries to food security, and maintenance of livelihoods. The management approaches developed and fostered through this project may also assist in curbing the trends in regional fisheries towards over-capacity and over-exploitation; the use of destructive fishing gear and practices; habitat destruction and pollution; and illegal fishing. The project implementation will also promote transparent and participatory approaches to gender interventions, particularly through gender awareness in all training and capacity building, as well as promotion of gender balanced staff profiles.

- B.4. Indicate risks, including climate change risks that might prevent the project objectives from being achieved, and if possible, propose measures that address these risks to be further developed during the project design:

Successful cross-sectorial co-ordination of activities between the fisheries and environment sectors in the participating countries is a key assumption. Many past marine protected areas in the region have been promoted in terms of their potential to improve the state of fisheries and their habitats, but have rarely included mechanisms to ensure the effective integration of fisheries considerations into management. In contrast, fisheries departments and ministries largely focus on achieving sustainable yields from fish stocks in the light of high community dependence on, and participation in small-scale fisheries. Experience in the South China Sea Project suggests that the risks that this assumption will not be met seems small as the fisheries *refugia* concept has provided an adequate platform for building the partnerships and enhancing communication between the environment and fisheries sectors to date. The

refugia concept was used successfully in 2006 to resolve a long running conflict between the fisheries and environment sectors in the Philippines regarding the utilization of fish stocks in areas of critical habitats in the Visayan Sea. Past experiences suggest therefore that this assumption will be met.

A second assumption is that small-scale fishing communities will support the initiatives and interventions proposed. At present many small-scale fishing communities, fisheries managers, and local government officials in the region equate area-based (zoning) approaches to fisheries management as the equivalent of no-take Marine Protected Areas. The latter are often viewed as unacceptable at the community level since they are rarely designed in locations of importance to the life-cycle of important fish species and neither improves fish stocks, nor the community's income. The net result of such activities has been the loss of fishing areas for small-scale fishers and non-compliance with fisheries management measures in the "protected" areas. The outcomes of extensive community and stakeholder consultations in the participating countries during 2005 and 2006 suggest that the *refugia* concept is well accepted by small-scale fishing communities and local officials. To date fishing communities in Cambodia, Indonesia, Philippines, Thailand, and Viet Nam have expressed their strong support for the establishment and management of fisheries *refugia* in areas of critical fisheries habitats. Achievements at pilot fisheries *refugia* sites in the Philippines, Thailand, and Viet Nam to date indicate that this assumption will be met.

A further assumption is that the national governments will take action to implement management plans for critical habitat areas of specific fisheries *refugia*, taking into consideration the vulnerability to climate change impacts and the need for adaptation response options. It is likely that this assumption will be met since all governments adopted habitat specific National Action Plans in support of the regional Strategic Action Programme and the further development of the system of fisheries *refugia* is part of the agreed SAP.

- B5. Identify key stakeholders involved in the project including the private sector, civil society organizations, local and indigenous communities, and their respective roles, as applicable:

Identification and management of fisheries and critical habitat linkages in the South China Sea and Gulf of Thailand are part of the project design in which 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 *Refugia*" for commercial fishes including bottom and pelagic species, will be conducted. These project activities will be developed based on consultation and recommendations during the organized regional workshops. Local people's indigenous knowledge and participation will be major factors to bring about and sustain an active fisheries habitat rehabilitation and management program. Scientific data and information will be supported by the views of the local people who will choose the right means or methods to strengthen their activities.

This project is also linked to the network, institutions (governmental, non-governmental, and private sector) and individual experts of the UNEP administered Regional Seas Programme and the Action Plan for the Protection and Development of the Marine and Coastal Areas of the East Asian Region. Involvement of SEAFDEC as an Executing Agency aims to establish greater political support and enhanced mainstreaming of fisheries habitat and ecosystem considerations with broader fisheries management initiatives in Southeast Asia. Such broader initiatives also include ASEAN, SEAFDEC, Sustainable Fisheries Partnership (SFP), and APFIC programmes on the use of subsidies in fisheries, overcapacity, illegal and unregulated fishing, co-management, and rights-based approaches to fisheries management.

- B.6. Outline the coordination with other related initiatives:

This project is designed to build on achievements of the fisheries component of the UNEP/GEF Project Entitled "Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand" (South China Sea Project) in establishing a regional system of fisheries *refugia*. The achievements include *inter alia*: the publication of UNEP/GEF Regional Working Group on Fisheries' Guidelines on the Use of Fisheries *Refugia* for Sustainable Capture Fisheries Management in Southeast Asia as part of

the ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia; identification of 52 locations in the South China Sea known as critical spawning and nursery habitats for fish species of transboundary significance; regional agreement on the inclusion of 14 sites in an initial system of fisheries *refugia*; production of a regional fisheries *refugia* information base; and prioritization of an additional nine sites from the remaining 38 sites for which further information is required. The project represents the implementation phase of the fisheries component of the revised regional Strategic Action Programme.

The UNEP/GEF Regional Working Group on Fisheries and SEAFDEC has noted the importance of close coordination with the proposed FAO/GEF Project on “*Strategies for Fisheries Bycatch Management*”. Similarly there is regional agreement that testing the *refugia* system in the South China Sea where significant preparatory work has been undertaken will provide a sound basis for the transfer of knowledge and experience on the use of *refugia* to fisheries habitat initiatives of the Western and Central Pacific Fisheries Commission and the Sulu-Sulawesi Marine Eco-Region programme in the adjacent coral triangle area. The project will also be implemented in close collaboration with the proposed coastal fisheries management project of the SEAFDEC-SIDA mechanism for the same time period (2012-2016). The latter project has been designed to link closely with actions of the fisheries component of the revised Strategic Action Programme for the South China Sea and Gulf of Thailand which this project aims to implement.

The project will actively engage in global knowledge sharing through IW:LEARN and set aside one percent (1%) of the GEF project budget from Component 3 (Information Management and Dissemination) to support IW:LEARN activities, such as setting up and running a project website consistent with IW:LEARN guidance; participation of project staff in IW Conferences and relevant regional conferences; and production of at least three IW Experience Notes.

C. DESCRIBE THE GEF AGENCY’S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:

Resolutions of the UN General Assembly and the decisions of the UNEP Governing Council that establish the mandate for the work of UNEP include sustainable fisheries; promoting the conservation and sustainable use of the marine and coastal environment, building partnerships and establishing linkages with multilateral environmental agreements; intergovernmental science-policy platform on biodiversity and ecosystem Services; promotion of sustainable consumption and production patterns; and Intensified environmental education for achieving sustainable development (Annex A, Legislative Mandates, UNEP/GC.26/13).

UNEP has been recognized by regional and international fisheries organizations as the appropriate agency to implement initiatives in Southeast Asia that focus on the integration of fisheries and environment considerations. This is due mainly to it being the only United Nations programme whose core business is the environment. UNEP is also placed well to facilitate the multi-stakeholder, intergovernmental consultations required to ensure the close cross-sectorial consultation between fisheries and environment departments in the designation and management of fisheries *refugia*. This is particularly important in relation to the designation by Ministries of Environment and of Marine Protected Areas to ensure that such areas are congruent with habitat areas of critical significance to fish stocks. This will involve the establishment of institutional mechanisms to effect the integration of habitat and marine biodiversity conservation considerations into fisheries management. UNEP has demonstrated its ability to achieve this goal and is evidenced by the intergovernmental regional guidelines on fisheries *refugia* adopted by ASEAN and SEAFDEC.

The project represents implementation of one component of the Strategic Action Programme for the South China Sea that was developed through the UNEP/GEF project entitled “*Reversing environmental degradation trends in the South China Sea and Gulf of Thailand*” and will build on the network of institutions, organizations and individuals responsible for the development of the *refugia* concept during execution of that project. SEAFDEC as the regional executing agency has collaborated with UNEP in the development and dissemination of the concept of the fisheries *refugia* and is the only regional fisheries body encompassing the South China Sea and Gulf of Thailand.

C.1 Indicate the co-financing amount the GEF agency is bringing to the project:

The agency direct in-kind co-financing value for this specific project is estimated at approximately 200,000USD over the project period and will be provided through various UNEP divisions (DEPI, DEWA, and ROAP) for the present project. In addition, UNEP DEPI, in collaboration with other partner organizations such as GRID Arendal, UNEP-Green Economy Initiative, and the Economics of Ecosystems and Biodiversity (TEEB) are also contributing other additional extra-budgetary resources (in cash and in-kind) through ongoing and planned parallel donor-funded initiatives that are directly linked and contribute to the present project. The total value of this additional contribution is estimated at approximately 265,000 USD over the project period.

Co-financing for the project will also come from the fisheries sector of participating governments both central and provincial governments and from the Southeast Asian Fisheries Development Center (SEAFDEC, an intergovernmental organisation and the regional executing entity for the project. It is anticipated that on the ground activities in the 14 identified *refugia* will be largely funded by national governments with some GEF IW funds in addition to the costs of regional co-ordination, and the sharing and transfer of lessons learned.

C.2 How does the project fit into the GEF agency's program (reflected in documents such as UNDAF, CAS, etc.) and staff capacity in the country to follow up project implementation:

The project fits within and complements the objectives and expected outcomes of the ongoing UNEP Programme of Work (PoW) 2010-2011 and upcoming POW for 2012-2013 (approved in Feb 2011), under the Resource Efficiency, Environmental Governance, Ecosystem Management, and Climate Change sub-programmes. Specific strategies under PoW include "Innovative practices in sustainable agri-food production and food supply chain management are promoted and supported by capacity-building in supplier countries and dialogue on actionable pathways to sustainability" and "[T]o build the capacities of regional, subregional, national and local entities to assess degradation, in order to slow down or reverse this trend while managing ecosystems for resilience. This implies that particular attention will be given to ecosystem functioning and the role of biodiversity. Priority will also be given to improving mechanisms for strengthening the science policy interface in the biodiversity-related multilateral environmental agreements."

UNEP, under the auspices of the Regional Office for Asia and the Pacific and the Coordinating Body on the Seas of East Asia (COBSEA) that all countries participating in this project are members, has an established and staffed office in Bangkok, and operated in close collaboration with FAO and other fishery-related agencies in the region including SEAFDEC and ASEAN. This existing set-up will provide the in-country presence and the technical, logistical and administrative support required to follow-up and facilitate liaison with national partners and project implementation in the country.

**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY (IES)**

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter(s) with this template. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Dr. Van Tai NGUYEN Mr. Dana A. KARTAKUSUMA	Director General, Institute for Strategic Policy of Natural Resources and Environment Special Advisor to the Minister on Economic and Sustainable Development Affairs	Ministry of Natural Resources and Environment, Vietnam Ministry of Environment, Indonesia	
Ms. Analiza Rebueta TEH Mr. Chote Trachu	Assistant Secretary, Department of Environment and Natural Resources, Foreign Assisted and Special Projects Office Permanent Secretary, Office of the Permanent Secretary	Department of Environment and Natural Resources, Philippines Ministry of the Natural Resources and Environment, Thailand	
Mr. Lonh HEAL	Technical Director General	Ministry of Environment, Cambodia	

B. GEF AGENCY (IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF policies and procedures and meets the GEF/LDCF/SCCF criteria for project identification and preparation.					
Agency Coordinator, Agency name	Signature	DATE (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
Ms. Maryam Niamir-Fuller, Director, GEF Coordination Office, UNEP, Nairobi					

**CONCEPT PROPOSAL
(Draft 5 Sep 12)**


Improving Methodologies and Capacity for the Collection of Capture Fishery Statistics in the Southeast Asian Region (new)

Project	Improving Methodologies and Capacity for the Collection of Capture Fishery Statistics in the Southeast Asian Region
Background and Rationale	<p>Fisheries has been recognized as an important sector providing substantial contributions to the economic development, food security and well-being of people in Southeast Asia. In 2010, the total fishery production of the region was 31.4 million metric tons, which accounted for about 20% of the global fishery production. As of the latest report, the sector must have employed more than 15 million people not including the women and young children who work in the processing industries and in marketing the fish. Despite its importance, fisheries is recognized to be among the poorest segment of the society.</p> <p>During the past decade, the sustainability of fisheries have been challenged by the over-exploitation of fishery resources and deterioration of habitats, the activities of other sectors sharing the same water resources, as well as the global initiatives to ensure sustainable utilization of fishery resources. Without adequate and reliable data and information, it is difficult for the agency responsible for fisheries to have full understanding on the status of fishery resources in order to come up with science-based management policy and plans to ensure sustainable utilization of fishery resources and sustain the contribution from fisheries to food security, as well as to communicate with public, and planners/policy makers on the importance of the sectors, and in making decision for trade-off between the emerging development projects and the necessity to secure fisheries and its habitats as important means of livelihood for the poor and disadvantage groups of people in the region.</p> <p>Fishery statistics is an important source of long-term data collected by the respective national agency responsible for fisheries. However, it is generally recognized that the available statistics figures of the region are very much under-reported due to the nature of fisheries, being multi-species fisheries, comprising large number of small-scale fishers and farmers, and the fact that large portion of the catch went directly to human consumption without being recorded anywhere. While the fishery statistics systems of some countries in the region are well developed and could provide reliable data and information, statistics collection systems in many less developed countries are not that well established, partially due to the aforementioned situation. The methodologies for collection of fishery statistics should therefore be improved, taking into consideration the specificity of fisheries of the region, so that countries would be able to come up with better quality data to serve as a basis for rationale policy planning and management measures, as well as to communicate with public, planners/policy makers and international societies to ensure sustainable development of fisheries of the region.</p> <p>In addition to the build-up of capacity of countries in the region in statistics data collection, SEAFDEC as an organization with mandate to support sustainable development of fisheries in the region also needs to build up it's competence and human capacity on fishery statistics-related aspects in order that the momentum of the work undertaken under this project could be carried on and further enhanced in the future.</p>
Project Description	The project aims to acquire external expertise to support the development of methodologies and tool kits that are appropriate for collection of fishery statistics in Southeast Asian region, and provide capacity building activities for countries in the region accordingly. In addition, the project also aims to enhance the capacity of SEAFDEC to effectively undertake statistics-related activities in the long-term basis.
Linkages to ASEAN Policy Framework	In 2011, the ASEAN-SEAFDEC Ministers responsible for fisheries adopted the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2020. This project has linkages with the specific Resolution and Plan of Action as follows:



	<p>Resolution</p> <p>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</p> <p>Plan of Action</p> <p>3. Strengthen national statistical mechanisms for fisheries and aquaculture and the exchange of statistical data and related information. Include other non-routine data and information such as fish consumption surveys as well as mobilizing local and indigenous knowledge with the aim of improving the valuation of fisheries and monitoring their performance, to address the needs of the ecosystem approach to fisheries and adaptation to climate change;</p> <p>5. Coordinate, decentralize and enhance the sharing of relevant statistics and information of fisheries-related statistical data and information between the national fisheries and other authorities including those responsible for food security, environment, trade, aquaculture, water resources, agriculture/forestry, wetlands, migration/employment and rural development;</p>
Goal	Improved quality of capture fishery statistics, better understanding on the status and trends of fisheries in the Southeast Asian region, and enhanced communication/cooperation between fisheries and other development sectors
Objective	Improved methodologies and capacity of the Southeast Asian countries for the collection of capture fishery statistics
Expected Outputs	<ol style="list-style-type: none"> 1. Handbook and tool kits for collecting capture fishery statistics for the region; 2. Enhanced capacity of officials of the Southeast Asian countries on the application of statistics data collection methodologies; and 3. Enhanced capacity of SEAFDEC staff on the statistics-related subjects.
Activities	<p>Activity 1: Development of Methodologies for collection of capture fishery statistics in the Southeast Asian region</p> <ol style="list-style-type: none"> 1.1 Regional Consultation (with members of the ASEAN Network on Fishery Statistics) to: identify problems and recommend areas for improving capture fishery statistics; identify available tools and methodologies for collection of capture fishery statistics (with pros and cons of each); identify expertise available in the region; and conclude the detailed project workplan. 1.2 Explore and acquire appropriate expert(s) in the region to support the undertaking of project activities (Activity 1 & Activity 2) 1.3 Conduct of desk study on available methodologies for collection of capture fishery statistics 1.4 Identify/select appropriate methodologies for different specificity of situations 1.5 Conduct of a series of pilot activities (in collaboration with Member Countries) to verify the applicability of methodologies 1.6 Development of draft handbook, with set of tool kits for collecting statistics from different specificity 1.7 Regional consultation workshop to finalize the handbook and tool kits 1.8 Production/dissemination of Handbook and tool kits <p>Activity 2: Capacity building on the collection of capture fishery statistics in the Southeast Asian countries</p> <ol style="list-style-type: none"> 2.1 Trainings/workshops on the application of statistics collection methodologies (following tool kits produced under Activities 1) <p>Activity 3: Enhancing capacity of SEAFDEC on fishery statistics-related subjects</p> <ol style="list-style-type: none"> 3.1 Acquiring staffs with strong competence in statistics subject 3.2 Participation of relevant SEAFDEC staffs to training courses, and activities related to fishery statistics and information <p>Activity 4: End-of-the-Project Evaluation</p>
Duration	5 years
Implementation Agency	Southeast Asian Fisheries Development Center (SEAFDEC)
Assumption /risks	Improvement of statistics is on-going process, and the application of methodologies and tool kits by responsible national agencies is subject to the policy and the availability of resources of the respective countries.

Fisheries Resources Management on Important Pelagic Species for Sustainable Fisheries in the Sulu-Sulawesi Sea (new)

Concept Note
<p>Project Title: Fisheries Resources Management on Important Pelagic Species for Sustainable Fisheries in the BIMP-EAGA Region</p>
<p>Executing Agency: The Southeast Asian Fisheries Development Center (SEAFDEC) SEAFDEC is an intergovernmental organization established in Southeast Asia responsible for the promotion of sustainable fisheries. Based on its technical competence in various disciplines of fisheries, SEAFDEC over the past 45 years has played a significant role in promoting sustainable fisheries development in the region.</p>
<p>Rationale The Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) region is identified as areas that, because their isolation, <i>i.e.</i>, distance far from capital cities, have less developed economic activities as compared to areas which are in closer proximity to large cities of the BIMP countries.</p> <p>However, special attention has been paid to these areas not only by BIMP countries but also the entire ASEAN community, because the ASEAN community recognizes that some economic sectors in the BIMP-EAGA region have a potential to be promoted in appropriate manners due to precious natural resources, and that these sectors will contribute to sustainable development of ASEAN.</p> <p>Among economic sectors to be further developed, considering that the BIMP-EAGA region contains many islands surrounded by oceans, especially pelagic fisheries such as tuna, sardine, round scads and makerel are the promising and important target sector that has high potential for utilization of abundant and precious fishereis resources in the region as well as for significant contribution to harmonious economic development of the BIMP countries.</p> <p>It is therefore imperative that sustainable development of fisheries in the BIMP-EAGA region should be addressed and enhanced. In particular, fisheries resources management based on analyses of scientific data and information is essential to a better understanding of necessity of such activities as well as to fostering consensus among fishers and local residents in the areas for implemenattion of resources management countermeasures that will result in sustainable development and poverty reduction in long term.</p>
 <p style="text-align: center;">Total Tuna Production in 2009</p>
<p>Sulu-Sulawesi sub-regional area, which this project is targeting to effectively utilize and manage resources of commercially pelagic species especially tunas, includes Sulu Sea, Mindanao Sea or Calebes Sea and Brunei-Sabah waters. This sub-regional area surrounding by BIMP countries comprises especially important fishing grounds and spawning grounds for tunas. Considering complicated sea boundaries, tuna migratory features, declining of resources, post-harvest loss, international/regional market driven and By-catch issues therefore tuna fisheries resources management becomes a common</p>



problem which should be tackled by all involved countries. In Sulu-Sulawesi sub-regional area, tunas play an important role when compare to other areas within the ASEAN region, accordingly the promotion of tuna sustainable fisheries in this area is a common regional challenge from the viewpoint of ASEAN Food Security and poverty reduction.

Project Strategy: When fisheries are well managed, fisheries provide benefits at national and local levels, providing the revenue to the country, employment to millions of fishers and people in associated trade, and food security to poor people. In fact, many challenges and the emerging issues such as impacts caused by the increasing pressures on fisheries and globalization of trade that are resulting in increased IUU fishing, the depletion of fish resources, habitat degradation, increasing conflicts among resource users including climate change and the growing gap between the increased demand for fish and fishery products and ASEAN's ability to supply these products in a sustainable maner. This will create risks to food security and livelihoods of ASEAN people, in particular the poor and disadvantaged. Accordingly, it is need to understand the status of fish resources, post harvest loss which effect to fishers' incomes, impacts of fisheries on environment/eco-system, effective fisheries management, and regional cooperation mechanism etc. For that reason, the project focuses mainly on: a) sustinable fisheries resources mangement by promoting the collaborative research program to assess tuna resources in the Sulu-Sulawesi Sea using the baseline survey data from both landing and at sea by the SEAFDEC research vessel; b) establishment of tuna stock assessment working group to facilitate development of fisheries policy planning and resources management in long term; c) improving of tuna handling and preservation techniques; d) promote RCCRF concept particularly Ecosystem Approach to Fisheries, enhance good governance; e) increasing the participation of fishers/community in development of fisheries policy; and f) strengthening sub-regional cooperation among BIMP countries to implement the effective fisheries management and to monitor the status of tuna resources.

Project Activities:

- 1) Inception Meeting for Project Planning with all BIMP countries
- 2) Regional workshop on reviewing the catch, biological data/information and environmental data for tuna fisheries in the Sulu-Sulawesi Sea
- 3) Implementation of the Collaborative Fisheries Resources and Environmental survey by SEAFDEC Research Vessel(s)
 - a. Research on fish/tuna early life history using fish larvae sampling net and Bongo net in the near shore and off shore of the sub-regional area;
 - b. Environmental/Oceanographic survey;
 - c. Inventory of FADs;
 - d. Scientific hydro-acoustic survey for biomass estimation and sampling for echo verification;
- 4) Capacity building to government officers on specific issues as follows:
 - Identification of fish larvae and utilization of research results for fishery resources management;
 - Fish stock assessment;
 - Good governance; and Effective management for sustainability.
- 5) Establishment of fish stock assessment working group from BIMP countries;
- 6) Evaluate the By-catch from tuna fisheries and assessing the impacts of FADs on the tuna populations;
- 7) Capacity building to fishers on improving of post-harvest tuna handling and preservation techniques, and value added product;
- 8) Regional Workshop on Scientific Findings from Collaborative Research Program:
Based on the progress/findings from the collaborative works, the policy recommendation on fisheries resources management could be formulated and disseminated to all BIMP-Countries; and
- 9) Organizing the Regional Consultation for BIMP countries on Strengthening the Sulu Sulawesi sub-regional cooperation for sustainable utilization & management of tuna.

How different it is for other or earlier projects?

This is collaborative research work in which the program will involve a number of participants including government staff and researchers from BIMP countries. It is expected that participants in charge of fisheries and resources management from each BIMP country will increase their abilities through the collaborative research survey and onboard training in the Sulu-Sulawesi sub-regional area. In addition, many local staff and fishers are involved in land survey activities at selected landing sites in the BIMP countries. Stock assessment working group from BIMP countries on pelagic species is established to ensure in long-term resources management for sustainable utilization. BIMP Countries accepted the agreement on the sub-regional cooperation for fisheries resources management through the high level

regional consultation.
Expected Outputs: The project's outcomes will facilitate fisheries policy planning and resources management as well as conservation of the marine diversity on "Sustainable Fisheries for Food Security" and poverty reduction in the BIMP-EAGA region. It is noted that the impacts, from the project sometimes may not direct to the poverty reduction in short term, are as follows: a) stock assessment tools for fisheries which enable appropriate management could reduce vulnerability to overexploitation, this would directly increasing fish stock and lead to increasing incomes of fishing community, b) increased government revenue from industrial fisheries that contribute to economic growth, through effective management for sustainability. It is also expected that when fisheries in the sub-region are well managed, the results will support Tuna Regional Fisheries Management Organization (RFMOs) such as WCPFC.
Project Duration: 5 Years from 2013-2017
Total Budget Requested: US\$ 1,500,000.00

STATEMENT

*By Dr. Yugraj Singh Yadava
The Bay of Bengal Programme Inter-Governmental Organization*

*Dr. Chumnarn Pongsri, Secretary-General, Southeast Asian Fisheries Development Center;
Mr. Kenji Matsumoto, Deputy Secretary-General of SEAFDEC;
Mr. Yeap Soon Eong, Chief of MFRD;
Dr. Magnus Torrell, Senior Advisor, SEAFDEC;
Distinguished SEAFDEC Member Country representatives to the Program Committee;
Distinguished colleagues from SEAFDEC;
Ladies and Gentlemen,*

I bring greetings from the Member Countries of the Bay of Bengal Programme Inter-Governmental Organization. I'm delighted to be here and on behalf of BOBP-IGO Member Countries, I express my thanks for inviting us to the 35th Meeting of the Program Committee of SEAFDEC.

Ladies and gentlemen, it is for the first time that BOBP-IGO is attending a formal meeting of SEAFDEC. Having said this, I may also like to mention that BOBP-IGO and SEAFDEC are cooperating in many other areas such as participating in workshops/seminars organized by each other. At the regional level, SEAFDEC and BOBP-IGO are members of the Asia-Pacific Fisheries Commission and collaborating partners in the Bay of Bengal Large Marine Ecosystem Project. At the international level, both SEAFDEC and BOBP-IGO are members of the Regional Fisheries Bodies Network and have the opportunity to sit together at its Bi-annual Meetings, held back-to-back with the Committee on Fisheries of the Food and Agriculture Organization of the United Nations.

Ladies and gentlemen, both SEAFDEC and BOBP-IGO have many things in common. Both are long-standing players in the region; SEAFDEC would be celebrating its 45th Anniversary from a month now and BOBP-IGO along with the former BOBP would be completing 33 years of existence in January 2013. During these long innings, both have contributed immensely to the sustainable development of fisheries and aquaculture in the region. However, the most significant and important attribute is that both the organizations are largely working for small-scale fishers, who constitute the key stakeholders of the fisheries sector in the region. The 11 SEAFDEC Member Countries and four BOBP-IGO member-countries, together, constitute an overwhelming segment of the global fisheries sector. This is not only in terms of the number of fishers, but also in fish production that contribute to both national food and nutritional security, and also to the global fish food basket.

Ladies and gentlemen, both the organizations are grappling with the twin issues of poverty alleviation on one hand and sustainable fisheries development on the other hand. To tackle them, the two Organizations are implementing many programmes, which have commonalities, thus bringing out the need for enhanced collaboration and cooperation.

Having witnessed the proceedings of the 35th Program Committee for the last two days, I'm highly impressed by the range of activities implemented by SEAFDEC. We at BOBP-IGO feel that the two Organizations can learn a lot from each other's experience, share successes and failures and cooperate in areas where our collaboration can be a win-win situation for both SEAFDEC and BOBP-IGO.

In this regard, I would like to state that while SEAFDEC is working in many seas shared by its Member Countries, it is the Bay of Bengal that brings SEAFDEC and BOBP-IGO more closely and where our cooperation can be most beneficial. While four SEAFDEC Member Countries border the eastern side of the Bay, the four BOBP-IGO Member Countries border the western side of the Bay. Together, we harvest the multi-species resources of the Bay. Therefore, together we also have the responsibility of sustainably managing the Bay's fisheries resources. Many fisheries of the Bay are not contained within the national boundaries, but straddle between two or more countries of the Bay.

Besides, outside the Exclusive Economic Zones of the Bay of Bengal countries, we also have substantial areas referred to as areas beyond national jurisdiction or ABNJ, where collective action is urgently required to safeguard the resources from Illegal, Unreported and Unregulated fishing and also unsustainable harvesting practices.

Ladies and gentlemen, there are various other areas where collaboration is desirable. In particular, I would like to mention the impact of climate change and the need to work together in planning adaptation strategies. Monitoring, Control and Surveillance; safety at sea; and management plans for sharks and rays are some of the areas where synergies can also be built. BOBP-IGO has its strength in safety at sea; providing social security nets to fishers, especially in the areas of microfinance and self-help groups; participatory approaches to fisheries management; and skills and capacity development of stakeholders at various levels. To promote MCS, we have collaborated with the Government of India in setting up an interactive web-based registry of all fishing vessels and a biometric identity card for fishermen. In social security, the Government of Bangladesh has been provided with technical assistance in setting up an indemnity programme for small-scale fishers and this is catching up with more than 20 000 fishers enrolling in the programme during the first two months of its initiation in September 2012. Sharing of information and networking in these areas can be important stepping-stones for enhanced collaboration between SEAFDEC and BOBP-IGO in the years to come.

With these words, and once again thanking for the invitation to BOBP-IGO, I wish the 35th Meeting of the Program committee all success.

STATEMENT

*By Mr. Robert Lee
Food and Agriculture Organization of the United Nations,
Regional Office for Asia and the Pacific (FAO/RAP)*

Honorable Secretary-General of SEAFDEC, *Dr. Chumnarn Pongsri*,
Distinguished Member Country Delegates to the SEAFDEC Program Committee,
Ladies and Gentlemen,

I sincerely wish to thank SEAFDEC for the opportunity participates as an observer of the 35th PCM. Firstly, I would like to thank you and our host, the Marine Fisheries Research Department for providing their warm hospitality.

FAO has had various cooperative with SEAFDEC during 2012, the most prominent being the implementation of the GEF funded regional trawl management project “Reduction of By-catch Phase II”. FAO places high importance on this project, and sincerely appropriates the strong support of the RFU in SEAFDEC/TD. We indeed look forward to continued close collaboration with SEAFDEC in this project which we are sure will contribute to the SEAFDEC Regional Programme in several key areas and which will be a major contributed to strengthening fisheries and management advice in the region.

On behalf of the APFIC secretariat I would like to thank SEAFDEC for cooperating in a number of regional consultative workshops with the Asia-Pacific Fisheries Commission (APFIC), most notably the participation in and the contributions to the APFIC Regional Forum Meeting, the 32nd Session of APFIC which was held in Da Nang, Vietnam in September this year and the FAO/NACA workshop on “The Sustainable Intensification of Aquaculture”.

Related to the Bay of Bengal Large Marine Ecosystem, FAO very much appropriates the SEAFDEC’s involvement with the Secretariat and in particularly with the SEAFDEC Member Countries of Indonesia, Malaysia, Myanmar and Thailand. FAO and BOBLME are hoping for stronger BOBLME-SEAFDEC collaboration in 2013, particularly in aspects of resources management and the roll out the regional training course in the Ecosystem Approach to Fisheries.

SEAFDEC Merits high esteem for the diverse and important range of activities carried out by the organization and is commended for its wide technical contribution to its members.

As an observer and close partner of SEAFDEC, FAO welcomes the opportunity of a more strategic SEAFDEC workplan that is provided by the ambitious the 2011 ASEAN-SEAFDEC Resolution and Plan of Action and its main thrusts. This will facilitate both our mutual planning and the identification and accessing of resources that will be required for its implementation. In this regard, we believe that the Program Committee and Members may try to build a smaller number of core programmes that involve more than one of the SEAFDEC Centres and thereby build greater cooperation between Member Countries around these core programmes and to use this opportunity to secure funding through the centres from both national budgets and international external donors.

Going into the future, FAO envisage and hopes for very close collaboration on a number of areas, namely

THE STATUS OF THE JAPANESE TRUST FUND FOR 2013 AND ONWARD

Japanese Trust Fund Program for 2013 has following 2 components.

(1) Japanese Trust Fund VI (New)
“Promotion of Sustainable Fisheries in Southeast Asian”
 This new Trust Fund will start from 2013 to follow almost Trust Fund II activities.
 This TF is composed of 2 sub components, 11 independent projects.

(Sub component 1)
“Enhancing the capability of member countries for sustainable utilization of fisheries resources”

This component projects focus on

- Capacity Building to Address International Trade-related Issues,
- Enhancing improvement of fishery statistics and information,
- Promotion of Counter Measure to IUU fisheries activities,
- Improvement of Catch Certification for International Trade

(Sub component 2)
“Strengthening the promotion of Sustainable Fisheries”

This component projects focus on

- Offshore fisheries resources exploration
- Improving post harvest technology
- Comparative Studies for Management of Purse Seine Fisheries
- Human Resource Development
- Optimizing energy use and improving safety
- Strengthening SEAFDEC Network

(2) Japanese Trust Fund V
“Promotion of sustainable aquaculture and resource enhancement in Southeast Asia”

This component will be implementing 4th year activities of 5 years plan in 2013
 This TF is composed of 7 independent projects.

This component projects focus on

- Promotion of Sustainable and Region-Oriented Aquaculture
- Promotion of Environment-friendly Resource Enhancement
- Preservation of Critical Fishing Ground
- Food Safety of Aquaculture Products

Total budget for 2013 is USD 962,056. This amount is 91.7% of total budget for 2012.

The reason of the decrease of JTF budget for 2013 is the constraint of budgetary condition in Government of JAPAN.

JTF Budget for 2013			
	(USD)		(%)
	2012	2013	2013/2012
TF II - VI	677,382	616,000	90.9
TF V	372,199	346,056	93.0
Total	1,049,581	962,056	91.7

TFV CONSOLIDATED BUDGETARY REQUIREMENT FOR THE YEAR 2013

Component / Project / Activity	Responsible Departments	2013
		Budget (USD)
Promotion of Sustainable and Region-Oriented Aquaculture Practices		83,400
1. Promotion of Sustainable and Region-Oriented Aquaculture Practices	AQD	83,400
Promotion of Environment-friendly Resource Enhancement		103,656
1. Resource Enhancement of Internationally Threatened and Over-Exploited Species in through Stock Release	AQD	48,600
2. Research and Management of Sea Turtles in Foraging Habitat in the Southeast Asian Waters	MFRDMD /TD	30,466
3. Research and Management of Sharks and Rays in the Southeast Asian Waters	MFRDMD /TD	24,590
Preservation of Critical Fishing Ground		65,500
1. Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement	TD	65,500
Food Safety of Aquaculture Products		93,500
1. Traceability Systems for Aquaculture Products in the ASEAN Region	MFRD	28,800
2. Accelerating Awareness and Capacity-Building in Fish Health Management in Southeast Asia	AQD	48,300
3. Food Safety of Aquaculture Products in Southeast Asia	AQD (MFRD)	16,400
TOTAL (PROJECT)		346,056

TFVI CONSOLIDATED BUDGETARY REQUIREMENT FOR THE YEAR 2013

Component / Project / Activity	Responsible Departments	2013
		Budget (USD)
Enhancing the capability of member countries for sustainable utilization of fisheries resources		277,000
1. Assistance for Capacity Building in the Region to Address International Trade-related Issues	SEC	82,000
2. Enhancing compilation and utilization of fishery statistics and information for sustainable development and management of fisheries in Southeast Asian region	SEC,TD	117,000
3. Promotion of Counter Measure to IUU fisheries activities	TD	45,000
4. Combating IUU Fishing in the Southeast Asian Region through Application of Catch Certification for International Trade in Fish and Fishery Products	MFRDMD	33,000
Strengthening the promotion of Sustainable Fisheries		339,000
1. Offshore fisheries resources exploration in Southeast Asia	TD	64,000
2. Improving post harvest technology	MFRD	35,000
3. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region	MFRDMD	60,000
4. Human Resource Development for Sustainable Fisheries	TD	65,000
5. Optimizing energy use and improving safety in fishing activities	TD	45,000
6. Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing related Countermeasures	SEC	70,000
TOTAL (PROJECT)		616,000

CONCEPT NOTE:

INTERGOVERNMENTAL FORUM ON LIVE REEF FOOD FISH TRADE (LRFFT)

BACKGROUND

The continuous demand for live reef fish, the methods of obtaining and rearing reef fish and the widening geographic scope of the LRFFT all pose major concerns to make the effective management of the fishery and its trade (Tsamenyi and Palma, 2012).

This Concept Note proposes a meeting among key government fisheries agencies within Coral Triangle Countries together with SEAFDEC to discuss strategies and identify pragmatic solutions to support sustainability of LRFFT industry in each country and the region. The intention of this meeting is to facilitate frank discussion on this issues leading to the development of a future management regime for LRFFT. This would be particularly focused on limiting the harvest and subsequent export of live reef fish, as well as the establishment of a Stakeholders Forum to support its implementation. This is also consistent with the Coral Triangle Initiatives' target of effectively achieving a more sustainable trade in live reef fish and reef-based ornamentals (CTI-CFF Regional Plan of Action, 2009).

OBJECTIVES

This is a two-part meeting, one involving expert inputs and the other pertaining to government-to-government dialogue. This aims to accomplish the following specific objectives:

Part 1

- To update heads of fisheries agencies on the status of LRFFT in general, and on coral trout, in particular;
- To clarify issues regarding important species harvested for LRFFT; and
- To engage governments to support appropriate measures that need to be put in place to sustain and manage LRFF resources in each country and collectively as CTI region.

Part 2

- To discuss and share country's current approach towards the management of LRFFT;
- To discuss specific country's stand on the management of LRFFT;
- To discuss potential common policies that CTI region need to advocate to support country initiatives and sustain the LRFF resources in the CTI region;
- To agree on a common approach to set fisheries control mechanisms as well as control of IUU fishing of LRFFT species; and
- To agree on tangible next steps towards government control of the exploitation of key LRFFT species including establishment of a Forum a mechanism for continuous dialogue.

PARTICIPANTS

1. 4 heads of fisheries agencies in 3 CTI countries (Indonesia, Malaysia and the Philippines) and Vietnam
2. 4 technical staff (*i.e.* quarantine, enforcement) involved in LRFFT concerns
3. 4 policy staff from fisheries agencies
4. 2 representative of the CTI-CFF regional secretariat
5. 2-3 select scientists in the region to provide information of the status resources and the trade
6. Representatives from SEAFDEC
7. Representatives from US CTI



HOSTING ARRANGEMENTS

This meeting will be hosted by SEAFDEC in collaboration with the CTI-CFF Interim Regional Secretariat. SEAFDEC will also provide a grouper scientist and a facilitator for this meeting. The US CTI will provide logistical support for this event.

PROPOSED DATE: 31 January – 1 February 2013

LOCATION: Bangkok, Thailand

**WORKSHOP ON FISH PASSAGE IN SOUTHEAST ASIA
“PRINCIPLES OF IMPROVED FISH PASSAGE AT CROSS-RIVER OBSTACLES,
WITH RELEVANCE TO SOUTHEAST ASIA”**

BACKGROUND

The Southeast Asian region is rich in freshwater fish species. In the Mekong River, more than 1,000 fish species exist. This constitutes an immense biodiversity. Migrations, be it long-distance migrations or shorter movements, are a critical lifecycle feature of many of these fish in Southeast Asia. Longitudinal and lateral fish passage in the form of movements or migrations is very important for many species to successfully complete their lifecycles. Physiological needs of fish needs to be satisfied, *e.g.* through spawning migrations to reach spawning and nursing grounds; feeding migrations to ensure food availability for growth; migrations to satisfy seasonal habitat preferences and/or the need for shelter (protection against environmental influences or predators); migrations for recolonization of river stretches after impacting events such as flooding or deterioration of water quality. All this is essential to the viability of populations of many riverine species.

Migrations and movements are also important to maintain genetic diversity. In some parts of the world, migrations even directly contribute to the influx and exchange of nutrients (*e.g.* in salmonid rivers where decaying salmonid carcasses lead to nutrient enrichments). Hence, the diversity of communities of living aquatic organisms (including fish) is very important for the productivity, stability (resistance and resilience) and aesthetics of inland water ecosystems. It is well recognized that biodiversity in fish communities is important for fisheries as only diverse fish communities and populations can form the basis of a thriving and sustainable fishery.

The construction of cross-river obstacles, *e.g.* dams and weirs, for various purposes including hydropower production, continues throughout Southeast Asia. Many of these dams and weirs have a negative impact on fish by hampering or blocking migrations. In particular, planned Mekong mainstream dams and dams at major Mekong tributaries are expected to have a major impact on the basin's fisheries and the people who depend upon them for food and income. But also dams and weirs on smaller rivers and streams negatively impact fish migration and hence biodiversity and the resilience of fish populations which, in turn, has impacts on fisheries. Stocking alone is also not a viable option. In fact, is often seen that released fingerlings had little or no chance to survive and grow due to release conditions and behavior, which is different from naturally grown-up fish. Therefore, it needs a more sustainable approach while also improving the stocking techniques. In general, it is now widely recognized that stocking cannot replace successfully the natural reproduction in the long term and therefore natural reproduction has to be fostered. In recognition of the importance of biodiversity and the role that natural reproduction plays in this respect, the protection and conservation of, and the access to, the relevant natural aquatic environment is receiving increased attention and is explicitly addressed by several international instruments, *e.g.* the Convention on Biological Diversity (CBD), the Ramsar Convention, the FAO Code of Conduct for Responsible Fisheries and related Technical Guidelines, as well as the EU Habitat and Water Framework Directives, to mention only a few.

OBJECTIVES AND SCOPES

This Workshop aims at raising general awareness of the usefulness, but also of limitations, of fish passage facilities. The WS further aims at providing information on planning, design, construction and monitoring in relation to fish passage facilities deriving from global experience, though mainly gained in temperate zones, as well as on relevant basic ecological criteria and fish behaviour at fish passes in general. The Workshop will also touch upon basic hydraulic criteria to be considered. Particular emphasis will be given to the choice of selection criteria when planning fish pass design, making reference to local circumstances (*e.g.* fish species present, hydraulic conditions, geological and geographical constraints, etc.) that need to be taken into consideration. Examples of existing design options for a wide variety of natural and technical fish passes will be presented. Upstream and downstream passage will be touched upon. Although most of the fish pass designs have been developed

in temperate zones of North America and Europe, basic principles in fish pass design can be applied also in other regions of the world, with species compositions different from those in North America and Europe. However, fish pass design can never be just copied and transposed from one location to another, but has to be thoroughly adapted to local conditions (*i.e.* both river conditions and fish species). The WS will also try to develop potential scenarios for fish passages in the region.

The Workshop is organized for fish/fisheries biologists, river ecologists, hydraulic engineers and administrators (responsible for watershed planning/management) from selected SEAFDEC Member Countries. Ideally, at least all these four categories of experts should be represented at the report to ensure a wider view on and discussions about the issues related to fish passage. It is important that both policy-relevant issues and biological issues in relation to fish passage are addressed, discussed and understood for further successful follow-up in the home countries. The Workshop intends to provide managers and fisheries biologists with a broad overview of information about the currently existing fish passage designs and monitoring methods, and their applications, the choice of the most appropriate methods and techniques. It is also important to know the legal issues related to fish passage.

DATE& VENUE

The Workshop is tentatively scheduled on 17-21 March 2013 in KhonKaen Province, Thailand.

ARRANGEMENTS

The Workshop will comprise one-day excursion to sites of scientific interest and relevance to the Workshop content; followed by 3-day workshop.

FAO will provide financial support of 21,200 USD to SEAFDEC for arrangements of the workshop, particularly for a maximum of 20 participants from the Southeast Asian countries (under FAO terms and conditions). FAO will also provide resource persons for the workshop.

In addition to funding support from FAO, SEAFDEC will also explore possibility to seek funding support from relevant projects and other organizations for additional participants from the Member Countries.

VIEWS OF THE SEAFDEC MEMBER COUNTRIES ON THE DRAFT GUIDELINES FOR THE ESTABLISHMENT OF COLLABORATING CENTRES FOR SEAFDEC

With reference to Para 83 of the Report of the 44th Meeting of Council of the Southeast Asian Fisheries Development Center (44CM) in April 2012, the Council Director for Singapore informed the Council on the Proposal for the Establishment of Collaborating Centres for SEAFDEC (appended as Annex 15 in the Report of the 39th Meeting of the SEAFDEC Council) which was considered by the SEAFDEC Council during its 39th Meeting in April 2007 (Para 43 and 44 of the Report of the 39th Meeting of the SEAFDEC Council in April 2007). Subsequently, the Council requested the SEAFDEC Secretariat to develop the guidelines in consultation with Singapore, for the collaborative arrangement between SEAFDEC and the Collaborating Centers within the Member Countries (Para 45 of the Report of the 39th Meeting of the SEAFDEC Council in April 2007). However, due to some circumstances beyond the control of the SEAFDEC Secretariat, the draft guidelines was not immediately circulated for comments of the Member Countries, but was circulated only after the 44CM. To date, eight countries (excluding Singapore) have provided feedbacks on the draft Guidelines, namely: Brunei Darussalam, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam, as shown below:

Brunei Darussalam: The guidelines are only relevant for any institutions intending to collaborate with SEAFDEC. However, if SEAFDEC wishes to collaborate with any particular institution, paragraph 13 of the draft guidelines, will be irrelevant and the paragraph had to be amended accordingly to support the collaboration.

Japan: SEAFDEC currently has some cooperative arrangements with other organizations in the member and non-Member Countries (e.g. Fisheries Research Agency (FRA) and Hokkaido University in Japan). These arrangements are quite useful for SEAFDEC, allowing the staff to participate in training programs, promoting academic exchange of information and other meaningful activities. On the other hand, since the draft guidelines had been prepared in 2007, and in order to put this issue forward, SEAFDEC could consider identifying the similarities and differences between the aforementioned arrangements and the “Collaborating Centre and that the output from the 3rd SEAFDEC Review Committee, which is examining the whole activities of SEAFDEC, is important to discuss on the aspects of the guidelines. Japan therefore suggested that issues relating to the draft guidelines could be addressed at the next Council Meeting along with the results of SEAFDEC review process, taking into consideration the current situation of co-operative works of SEAFDEC with other organizations.

Lao PDR: *No objection on the draft Guidelines*

Malaysia: *No comment on the proposed Guidelines*

Myanmar: *the conditions mentioned in the Guidelines are acceptable and no further comment.*

The Philippines: *Support the approval of the draft Guidelines*

Thailand: *Agreed with the draft Guidelines*

Vietnam: *Agreed with the draft Guidelines*

REQUIRED CONSIDERATION BY THE PROGRAM COMMITTEE

The Committee is invited to discuss the terms of reference, criteria for selection and mechanism for establishment of the “Collaborating Centre” as mentioned in the draft Guidelines. The Committee is also requested to provide guidance on the ways and means of enhancing the efforts of SEAFDEC to explore more technical cooperation with relevant agencies ensuring that highest benefit could be obtained by the Member Countries. The recommendations of the Committee will be, as appropriate, submitted to the forthcoming Meeting of the SEAFDEC Council for consideration and approval.

GUIDELINE FOR THE ESTABLISHMENT OF SEAFDEC COLLABORATING CENTRES

(Draft proposed by Singapore)

Background

1. SEAFDEC was established in 1967, and operated with an organizational structure comprising a Secretariat and four technical Departments, namely Aquaculture Department (AOD), Marine Fisheries Research Department (MFRD), Marine Fishery Resources Development and Management Department (MFRDMD), and Training Department (TD). Each Department specialised in various fields of fisheries development. The Departments are hosted by Member Countries, viz., AOD by Philippines, MFRD by Singapore, MFRDMD by Malaysia, and TD by Thailand. Over the years, these Departments have developed regional expertise in their specific fields * AOD in Aquaculture, MFRD in Fisheries Post-Harvest Practices, MFRDMD in Fisheries Resource Development and Management, and TD in Fisheries training on use of modern Fisheries Technology. Until the 31 December 2006, the operations of the Departments were based on funding from Japan and the hosting governments. Funding from Japan was in the form of annual contributions.
2. In May 2006, the SEAFDEC Council Director for Japan informed fellow SEAFDEC Council Directors that the Japanese Ministry of Foreign Affairs would cease to provide the annual regular contribution to SEAFDEC from 1 January 2007, and requested that:
 - (a) Host countries assume full financial responsibility for its Department; and
 - (b) Each Member Country secures a Minimum Regular Contribution (MRC), similar to membership fees, to SEAFDEC for 2007 and beyond. The formula used and adopted by the Council was based mainly on Gross Domestic Product (GDP) of the Member Countries and other criteria such as the size of the fisheries, whether the member country is a host country, etc.
3. At the 39th Meeting of the Council Directors of SEAFDEC, the Council approved Singapore's proposal to allow the Post-Harvest Technology Centre of the Agri-Food & Veterinary Authority of Singapore (AVA) to be the SEAFDEC Collaborating Centre for implementing SEAFDEC's programmes in fisheries post-harvest technology.
4. At the same meeting, the Council also requested SEAFDEC Secretariat in consultation with Singapore to draft a Guideline on the establishment of SEAFDEC Collaborating Centres.
5. This draft guideline was prepared by Singapore and submitted to SEAFDEC Secretariat in 2007. It identifies and establishes a mechanism for formalising and adopting institutions, in and outside SEAFDEC membership, specialising in certain fields of Fisheries as Collaborating Centres of SEAFDEC.
6. This paper describes such a Guideline, elaborating on the scope of Collaborating Centres, Terms of Reference for such a Centre, criteria for selection, and mechanism for adopting centres as Collaborating Centres"
7. The first use of national institutions as collaborating centres started in 1947 as World Health Organisation (WHO) was established and National Laboratories were first designated as reference centres for specific purposes. These reference centres became WHO collaborating centres as early as 1949 when WHO laid down the policy "that research in the field of health is best advanced by assisting, coordinating and making use of activities of existing institutions". The OIE is another international organisation that taps on the strength of their collaborating centres.

Collaborating Centres

Scope

8. Collaborating Centres are therefore centres of expertise in a specific designated sphere of competence relating to the management of a particular sector of industry, providing their expertise to an organization that the countries operating these centres are members of. In the case of Singapore's Collaborating Centre for SEAFDEC, the specific designated sphere of competence is Fisheries Post-Harvest Technology, the particular sector of industry is Fisheries in Southeast Asia, and the organization is SEAFDEC.

9. A SEAFDEC Collaborating Centre will therefore form part of an inter-institutional collaborative network of SEAFDEC to support its programme at the country, inter-country, regional, inter-regional and global levels, as appropriate, with the approval of the Council of SEAFDEC.

Terms of Reference

10. Following Terms of Reference (TOR) shall apply for a Collaborating Centre of SEAFDEC:

- To serve as a centre of research, expertise and dissemination of research and development programmes within its sphere of competence for Member Countries of SEAFDEC;
- To operate independently from SEAFDEC, both financially and administratively, and have such operations solely governed by the Government of the nominating country; and
- To propose or develop any research and development activities which will enhance sustainable tropical fisheries development in the Southeast Asian region for the consideration of the Council of SEAFDEC.

11. Serving as a centre of research and expertise, the Collaborating Centre would provide facilities to personnel of Member Countries of SEAFDEC for attachments to undertake studies on specific projects at the Collaborating Centre and advice Member Countries on issues related to the competence of the Collaborating Centre, with the cost of both services being borne by Member Countries concerned.

12. The mechanism of dissemination of research and development programmes by the Collaborating Centre would include the following, and whether the cost of such dissemination would be borne by the recipients would be decided by the Collaborating Centre on a case-by-case basis:

- Training of personnel from Member Countries of SEAFDEC;
- Publications of scientific findings and technologies developed; and
- Workshops and seminars on specific topics which the Collaborating Centre has expertise in advice to Member Countries of SEAFDEC on the specific field of expertise

13. Although operating independently from SEAFDEC, the Collaborating Centre would report its activities and plans at SEAFDEC's annual Program Committee Meetings and Council Directors Meetings and any other appropriate forums as organised by SEAFDEC. However, the Collaborating Centre would decide on which SEAFDEC programmes it would be able to implement for the year, based on its financial and manpower resources, and may exercise the option of not executing all programmes that have been decided by the Council of SEAFDEC for that particular Collaborating Centre.

14. In proposing or developing research and development activities for Member Countries of SEAFDEC, the Collaborating Centre would bear in mind the needs of the Member Countries in particular and the Southeast Asian region in general, so that the technologies resulting from such research and development studies would be applicable and practical to these countries.

15. The Government or its agency operating the Collaborating Centre and/or the Council of SEAFDEC may decide to withdraw the centre as a Collaborating Centre for SEAFDEC, and under such a situation, the former must serve 3 months notice to the Council of SEAFDEC of such an intent, and vice-versa, whereby a formal acceptance and/or notification of the withdrawal would be issued by the Council of SEAFDEC.

Criteria for selection

16. As a rule, SEAFDEC Collaborating Centres must be selected from centres, which could be institutions, laboratories and establishments, that are renown and specialised in fields that are relevant and can contribute to the implementation of SEAFDEC programme activities. They must fulfil one or several essential functions in support of SEAFDEC programmes and key priorities, as identified by Council of SEAFDEC. These centres need to be national centres operated by Governments of Member Countries of SEAFDEC or countries that are non-members of SEAFDEC, and the Government concerned or its agency must offer the centre to SEAFDEC as a Collaborating Centre under the TOR outlined above.

17. Within this context, the criteria to be applied in selecting a centre for designation as a SEAFDEC Collaborating Centre are:

- The scientific and technical standing of the centre concerned at the national and international levels, with particular reference to its recent record of achievements, its ongoing activities, expertise of its staff, and facilities available to SEAFDEC Member Countries;
- The financial standing of the centre vis-a-vis support to SEAFDEC and Member Countries, in terms of carrying out the programmes of SEAFDEC;
- The network which the centre has developed with other institutions in the country as well as at the inter-country, regional and global levels;
- The technical and geographical relevance of the centre and its activities to SEAFDEC's mandate and programme priorities.

Mechanism for adoption

18. The following internal rules are suggested for incorporation in SEAFDEC's operating guidelines for adoption of Collaborating Centres:

Article 1

Applications for a centre to be a Collaborating Centre of SEAFDEC shall be submitted to the Council of SEAFDEC through the Secretary General of SEAFDEC by the Council Director of a Member Country or Director General of Fisheries (or its equivalent) of a nonmember Country to which the centre belongs. The Secretary General will in turn inform the applicant of the Terms of Reference (TOR) of a SEAFDEC Collaborating Centre.

Article 2

Applications received shall be presented to the Council of SEAFDEC, after consultation with the appropriate Expert Advisory Committee and/or Program Committee at its annual meetings. Applications shall be selected solely on the basis of scientific and technical competence of the candidate centre and its acceptance to meet the TOR outlined.

Article 3

After approval by the Council of SEAFDEC, the Secretary-General of SEAFDEC shall notify the applicant through a letter of notification of the decision of Council of SEAFDEC.

Article 4

Notification shall entitle the Centre to use the name of "SEAFDEC Collaborating Centre" and the use of SEAFDEC logo on all documents issued by the Centre in its official capacity in executing SEAFDEC programmes.

Article 5

The rights conferred by Article 4 shall require full compliance by the Collaborating Centre with its mandate, within the limits of facilities and manpower resources available, and provision of a brief annual report of its activities and plans at the end of each calendar year of its mandate at the Program Committee Meeting and SEAFDEC Council Meeting. This report will be distributed to all Member Countries.

Article 6

The designation "Collaborating Centre" shall be valid for four years, at the end of which the Secretary-General may propose to the Council of SEAFDEC that it be renewed for the same or shorter periods, if warranted by programme requirements and results of evaluation. Either party may revoke this designation at any time, serving 3 months notice.

Article 7

The Director of the Collaborating Centre and his alternative will be members of SEAFDEC's Program Committee and are to attend all Program Committee Meetings organised by SEAFDEC to discuss the research and development activities and plans of the Centre in relation to the programmes of SEAFDEC.

Article 8

The Director of the Collaborating Centre and his alternative shall attend all SEAFDEC Council Meetings representing its Collaborating Centre, and present the activities the Centre has conducted during the year and plans of future activities for the following year.

19 The Expert Advisory Committee and/or Program Committee shall provide the Council of SEAFDEC with its evaluation on the degree that the centre can meet the criteria outlined in Para 17, and the following assessment:

- a. The impact of the service that the centre can make as a Collaborating Centre to SEAFDEC's programmes and development, both immediate and in the long term;
- b. The political risk, if any, in adopting the centre as a Collaborating Centre; and
- c. The alternatives of not accepting the centre's application to serve as a Collaborating Centre;

20 Designation must be by agreement with the administrative head of the centre after consultation with national authorities.

Conclusion

21 Singapore's proposal to re-designate MFRD to a Collaborating Centre that is nationally operated has been approved by Council Directors at their 39th SEAFDEC Council Meetings. A guideline on the scope, Terms of Reference (TOR), selection criteria, and mechanism for adoption of Collaborating Centres has been drafted.

Date drafted: 4th November 2007

Drafted by: Singapore

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!

The adoption of the Report of this Meeting brings us to the conclusion of the official business of this Meeting. Overall, the results of our deliberations lead us to conclude this Meeting with much satisfaction and for that, I wish to express our deep appreciation and gratitude to all of you for your active participation especially for expressing your ideas and comments as well as your valuable suggestions on the various issues that we discussed. All of you have indeed contributed your parts that made the Meeting achieved its objectives. I would also wish to thank our Secretariat staff that worked hard to make this Meeting successful. SEAFDEC is also grateful to the Marine Fisheries Research Department for making this Meeting possible here in Chiang Mai.

As you are already aware of, your valuable inputs and recommendations on the projects and activities of SEAFDEC adopted at this Meeting would be presented to the next Meeting of the FCG/ASSP and to the forthcoming SEAFDEC Council Meeting as appropriate, for final endorsement. We must recall that during our three-day discussion, a wide range of issues on the SEAFDEC programs had been put forward especially with regards to the appropriateness and effectiveness of the program implementation in response to the needs and requirements of the Member Countries. SEAFDEC is therefore thankful for all your efforts.

The outputs and recommendations at this Meeting will be submitted to the FCG/ASSP Meeting, which will be convened from tomorrow until Friday. After their deliberations, the suggested changes relevant to the implementation of the programs will be presented during the next Meeting of the SEAFDEC Council for approval and inclusion in the overall activities of SEAFDEC.

Finally, Ladies and Gentlemen, 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 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-fifth Meeting of the Program Committee closed.

Thank you.