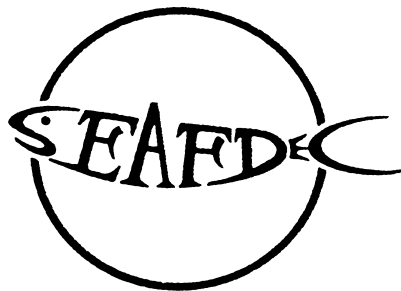


**REPORT OF  
THE THIRTIETH MEETING OF THE PROGRAM COMMITTEE  
OF THE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

**Iloilo City, the Philippines  
26-28 November 2007**



**THE SECRETARIAT  
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

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## EXECUTIVE SUMMARY

1. The Thirtieth Meeting of the Program Committee of SEAFDEC was organized in the Philippines from 26 to 28 November 2007, and hosted by the Aquaculture Department. The objective of the Meeting was to review the results of the programs implementation during the year 2007. The Committee Members also discussed on: overview of Japanese Trust Fund Programs for 2008; progress for establishment of the Regional Fisheries Advisory Committee for Fisheries Management in Southeast Asia. The outcomes of the program scrutiny, and agreed recommendations of the Committee will be submitted to the forthcoming meeting of the Council for consideration and approval. Outcomes and recommendations of the Meeting are:

### **Departmental Programs**

2. The Committee reviewed/endorsed 9 existing programs [including: (1) *Center-wide Information Network* (SEC), (2) *Information and Communications Technology* (TD), (3) *Integrated Mollusc Production* (AQD), (4) *Mud Crab and Shrimp Domestication* (AQD), (5) *Marine Fish* (AQD), (6) *Small-holder Freshwater Aquaculture* (AQD), (7) *Seaweed Strain Improvement* (AQD), (8) *Aquatic Ecology* (AQD), and (9) *Other Research & Development Activities*, implemented during 2007, and to be continued in 2008], and 1 new proposed programs for 2008 namely *Tailor-made Training and Study Tour* (TD).

3. The Committee Member from Thailand supported the establishment of the Global Small-Scale Fisheries Website, as the information would be useful for the development of small-scale fisheries in the region and as reference during the forthcoming Small-scale Fisheries Conference to be convened in Bangkok in 2008.

4. Due to the need for the compilation and production of timely and accurate Fishery Statistical Bulletin, new framework of fishery statistics in Southeast Asia was finalized in December 2007. Noted that questionnaires for the compilation of fishery statistics in Southeast Asia will be harmonized and streamlined with those of the FAO.

5. TD and the Australian Maritime College are developing a Master's Degree Program through e-learning (Responsible Fishing, Coastal Fisheries Management, and Ecology). A certain number of scholarships for such training courses may be provided to the Member Countries.

6. Since many activities that related to data and information are implemented under several programs, the overall framework and linkages of such relevant programs should be provided to the Committee Members. The forthcoming Workshop on Fisheries Information and Database to be organized by TD could be an appropriate opportunity to discuss this matter.

7. Under the program on *Information and Communications Technology*, TD was requested to compile and disseminate information on climate change and its impacts to fisheries.

8. The Committee Member from Myanmar requested AQD to extend its assistance to Myanmar, i.e. conservation and management of mud crab, mud crab fattening, GAP for freshwater species (e.g. tilapia to meet the requirements of importing countries), and culture of high value species of marine fishes (e.g. grouper).

9. The Committee Member from Vietnam requested AQD to extend the mechanism regarding AQD's Agree-Build-Operate-Transfer (ABOT) project to other Member Countries. AQD agreed to communicate with Vietnam on the procedures and necessary arrangements of the ABOT project.

10. Noted that the proposed new Departmental Program on *Tailor-made Training and Study Tour* will be funded from extra-budgetary sources.

11. Although the Departmental Programs are supported by the Governments hosting the Departments and non-traditional sources of funds, the Meeting suggested that these programs should be regional in nature, reflecting regional priority and providing benefits to the Member Countries.

### **Programs under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) Mechanism**

12. The Committee reviewed progress and achievements of FCG Programs in the year 2007 (totally 23 programs), and endorsed activities for 2008 (totally 26 programs).

#### ***Existing ASEAN-SEAFDEC FCG Programs (implemented in 2007, and to be continued in 2008)***

- 1) *Regionalization of the Code of Conduct for Responsible Fisheries (RCCRF) (SEC)*
- 2) *Assistance of Capacity Building in the Region to Address International Trade Related Issues (SEC)*
- 3) *Strengthening Small-scale Fisheries Management through the Promotion of Rights-based Fisheries and Co-management (TD)*
- 4) *Improvement of Fishery Statistics and Information for Planning and Management of Fisheries in the ASEAN Region (SEC)*
- 5) *Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature) (TD)*
- 6) *Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement (TD)*
- 7) *Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses (TD)*
- 8) *The Use of Indicators for sustainable Development and Management of Capture Fisheries in the ASEAN Region (MFRDMD)*
- 9) *Development of Integrated Inland Fisheries Management in ASEAN Countries (MFRDMD)*
- 10) *Development of Technologies and Human Capacity Building for Sustainable Aquaculture (AQD)*
- 11) *Quality Assurance Systems for Small and Medium-sized Fish Processing Establishments in ASEAN Member Countries (MFRD)*
- 12) *Utilization of Freshwater Fish in ASEAN Member Countries (MFRD)*
- 13) *Good Laboratory Quality management in ASEAN Member Countries (MFRD)*
- 14) *Environmental Related Tasks in Southeast Asia (SEC)*
- 15) *Establishment of Disease Surveillance System of Aquatic Animals (AQD)*
- 16) *Chemical and Drug Residues in Fish and Fish Products in Southeast Asia (MFRD)*
- 17) *Research and Development (R&D) of Stock Enhancement of Species under International Concerns (AQD)*
- 18) *Research for Stock Enhancement of Sea Turtles (MFRDMD)*
- 19) *Capacity Improvement of Fisheries community for Fisheries Management and Alleviation of Poverty (TD)*
- 20) *Support to Tsunami Rehabilitation of Affected Countries in the ASEAN Region (SEC)*
- 21) *Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2 (TD)*
- 22) *Deep Sea Fisheries Resources Exploration in the Southeast Asia (TD)*
- 23) *Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea (MFRDMD)*

### ***New Proposed ASEAN-SEAFDEC FCG Programs***

- 1) *Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in ASEAN Region (SEC)*
- 2) *Development of Regional Database for Fishery Management (TD)*
- 3) *Information Collection of Highly Migratory Species in Southeast Asia Waters (TD)*

### **ASEAN-SEAFDEC FCG Program**

#### **• Secretariat**

13. The program on *RCCRF* will be renamed to *Support to the Implementation of the Code of Conduct for Responsible Fisheries (CCRF) in the ASEAN Region*. SEAFDEC was requested to continue to provide assistance to the Member Countries to implement CCRF, and to facilitate/implement Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU fishing in the Region.

14. By the program on *Assistance of Capacity Building in the Region to Address International Trade Related Issues*, noted that the consultation on International Fisheries-Related Issues will be organized in early 2008, and its outcomes will be submitted to the Council and the ASWGF<sup>1</sup> Meetings. It will also be useful for participation of the Members and SEAFDEC at the FAO Sub-Committee on Fish Trade in June 2008. The Committee further suggested that important fisheries-related issues i.e. climate change, fishery subsidies, traceability, small-scale fisheries as well as other issues to be discussed at the FAO Sub-Committee on Fish Trade and Sub-committee on Aquaculture in 2008 should be incorporated in the SEAFDEC's program.

15. With regards to the program on *Improvement of Fishery Statistics and Information for Planning and Management of Fisheries in the ASEAN Region*, the Committee Member from Thailand expressed the willingness to be one of the pilot countries to develop the national status and trends of fisheries and aquaculture in 2008.

16. Under the program on *Environmental Related Tasks in Southeast Asia*, the Committee Member from Japan requested SEAFDEC to continue supports to the Member Countries in developing the National Plan of Action – Sharks, as shark species may be listed in appendices at the next Conference of Parties of the Convention on Trade in Endangered Species of Wild Flora and Fauna in 2010.

17. SEAFDEC was requested to actively involve in the International Small-scale Fisheries Conference to be organized by FAO and co-hosted by Thailand in collaboration with SEAFDEC and WorldFish Center (e.g. deliver keynote speech, arrange small panel discussions, put up exhibition booths and disseminate information materials as well as having strong intervention during the conference).

#### **• Training Department**

18. Noted that the program on *Strengthening Small-scale Fisheries Management through the Promotion of Rights-based Fisheries and Co-management* will replace *Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management*, starting in 2008.

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<sup>1</sup> ASEAN Sectoral Working Group on Fisheries

19. Under the program on *Responsible Fishing Technologies and Practices*, noted that the Philippines completed a series of experiments on the use of JTEDs in various areas of the country. The policy on the use of JTEDs was drafted and consulting with stakeholders before its approval. Noted also that the Philippines will also conduct experiment of a new gear for small-scale shrimp trawlers. However, the assistance from TD was sought in the implementation of such experiment. The Meeting was also informed of the completion of publication on Fishing Gear and Methods in Brunei Darussalam which is ready for distribution.

20. By the program on *Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement*, noted that activities in following up to this program are now replicated in several areas of the Philippines. Subsequently, TD was requested to continue implement this program.

21. With regards to the program on *Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2*, the Committee Member from Myanmar requested TD to conduct a bottom vertical longline survey in the untrawlable fishing grounds in Myanmar. And the Committee Member from Vietnam proposed to extend deadline for finalization of the proposals on the use of M.V. SEAFDEC 2 until the end of 2007.

22. The program on *Information Collection of Highly Migratory Species in Southeast Asian Waters*, the Committee Member from Vietnam suggested TD to collect information from all countries bordering the South China Sea for the program implementation.

23. The new program on *Development of Regional Database for Fishery Management*, the Committee Member from Thailand suggested that the database directory should be established based on the Member Countries agreed minimum data requirements. Thailand proposed to be the lead country for database directory establishment.

- **Marine Fisheries Research Department**

24. With regards to the program on *Chemical and Drug Residues in Fish and Fish Products in Southeast Asia*, MFRD was requested to explore the possibility to extend the program beyond 2008. In addition, the Committee Member from the Philippines anticipated in collaborating on analysis of antibiotic residues in aquaculture products.

25. With regards to the implementation of the ASEAN Roadmap for Integration of Fisheries Sector specifically on food safety, MFRD was requested to assist Myanmar in dispatching experts on food safety practices (e.g. HACCP and GMP/SSOP guidelines) in order to effectively implement laws, updated regulations, and standards in line with the requirements of importing countries as well as for their local consumption.

- **Aquaculture Department**

26. With regards to the program on *R&D of Stock Enhancement of Species under International Concerns*, the Committee Member from Thailand suggested that the involvement of the Member Countries in the program should be intensified through the conduct of a regional workshop on assessment of the existing methodologies.

27. With regards to the *Development of Technologies and Human Capacity Building for Sustainable Aquaculture*, the Committee Member from Vietnam proposed that funds (e.g. from the Japanese Trust Fund) to support the participation of the Member Countries in such training courses should be provided.

28. Regarding the AQD programs, the Committee Member from Myanmar requested for the transfer of technology on mud crab fattening. This would be an effective way to protect/nurse the under-sized mud crab collected from the landing sites into marketable size.

29. In order to strengthen the implementation of activities on sustainable aquaculture development, AQD was recommended to coordinate closely with the NACA<sup>2</sup> on areas of common interest.

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

30. With regards to the program on *Research for Stock Enhancement of Sea Turtles*, the Committee Member from the Philippines suggested that follow-up actions on the interaction between sea turtles and fisheries should be conducted. In addition, the Committee Member from Brunei Darussalam suggested that this program should be implemented in all Member Countries.

31. The Committee from Myanmar requested for the continuation of the activities in Myanmar on the installation of Platform Transmitter Terminals for Olive Ridley Turtle and Green Turtle. In addition, he suggested SEAFDEC to conduct awareness and educational program for the local people and the fishermen in various sites of Myanmar to make them aware on the importance of sea turtles and for them to avoid killing the sea turtles.

32. Under the program on *Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea*, and the Philippines will communicate with MFRDMD and TD on their proposed activities for 2008.

33. As there are inactive programs but considered important, SEAFDEC was requested to seek funding support from possible donors e.g. ADB<sup>3</sup>, the Australian Centre for International Agricultural Research, etc. The Meeting agreed that tailor-made activities may be arranged to address the priorities and requirements of the Member Countries. For the financial support to such programs, the forthcoming Department Chiefs' Meeting will further explore the potential sources of funds. Subsequently, the Meeting dropped the 4 programs until funding becomes secured, including: (1) *The Use of Indicators for sustainable Development and Management of Capture Fisheries in the ASEAN Region (MFRDMD)*; (2) *Development of Integrated Inland Fisheries Management in ASEAN Countries (MFRDMF)*; (3) *Utilization of Freshwater Fish in ASEAN Member Countries (MFRD)*; and (4) *Good Laboratory Quality Management in ASEAN Member Countries (MFRD)*.

**Other Programs**

34. The Meeting noted of the other existing 5 programs implemented in 2007, 1 new programs for 2008, and the plans of programs in 2008 These include: (1) *Promotion of Set-Net; an Eco-friendly Fishing Gear of Sustainable Coastal Fisheries Management (TD)*; (2) *Information Collection for Economical Important Species: as Surimi Raw Materials (TD)*; (3) *Cetacean Research in Southeast Asian Waters*; (4) *Whale Watching Program (new, TD)*; (5) *Collection of Information about International Support in the Region (TD)*; and (6) *Promotion of Sustainable Freshwater Aquaculture for Rural Communities (SEC)*.

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<sup>2</sup> Network of Aquaculture Centres in Asia-Pacific

<sup>3</sup> Asian Development Bank

35. With regards to the program on *Promotion of Set-Net an Eco-friendly Fishing Gear of Sustainable Coastal Fisheries Management*, noted that the Workshop on Set Net was organized by the Department of Fisheries of Thailand in collaboration with JICA and TD in 2007, and TD has planned to conduct a training course on eco-friendly fishing gear for representatives from the Member Countries in April 2008.

36. With regards to the program on *Information Collection for Economical Important Species: as Surimi Raw Materials*, the Meeting suggested that investigation on new species and use of inland capture fisheries and aquaculture for its raw materials should also be conducted and studied. Subsequently, TD was requested to collaborate with MFRD and AQD when implementing such activities.

37. With regards to the program on *Cetacean Research in Southeast Asian Waters: Whale Watching Program*, noted that the activities aim to collect scientific information on Cetacean species composition by using the M.V. SEAFDEC 2 based on her existing cruise plans. The Committee Member from Cambodia requested to also include the collection of information on freshwater for conservation purposes.

38. Considering the proposed program on *Collection of Information about International Support in the Region*, the Meeting indicated that the objectives, expected outputs and proposed activities were unclear. Therefore, TD was requested to provide relevant information of the program for further review by the Member Countries. The Meeting indicated that there is missing information from other sources e.g. the ADB, Norad, Danida, Sida, Japan, etc.

39. Noted that the program on *Promotion of Sustainable Freshwater Aquaculture for Rural Communities* has been implemented by SEC as an ad-hoc project which aims to reduce development disparity among Member Countries, and the emphasis is given to countries that inland fisheries and freshwater aquaculture are important for rural development.

40. Since there are limited number activities at present focusing on inland and freshwater fisheries, the Meeting therefore suggested that programs on development of rural communities, e.g. aquaculture and fisheries in inland waters, can be proposed under the ASSP framework to the forthcoming ASEAN-SEAFDEC FCG and ASWGFi Meetings for consideration.

### **Overview of Japanese Trust Fund (JFT) Programs for 2008**

41. Noted that some of the proposals, submitted to the program planning meeting of JFT held in 2007, have been accommodated in the regional programs to be implemented in 2008 under the new JTF-2 and JTF-3 and JTF-4. In order to finalize the JFT Programs for 2008, the Program Lead Departments in coordination with the Lead Countries were requested to make changes into the annual plan and submit the revised annual plan to the Secretariat by 2007 for submission to the Fisheries Agency of Japan as early as possible. Noted that after the approval of the budget for the Japanese Fiscal Year 2009, a Program Planning Meeting for the TF5 will be organized in 2009 to discuss the activities' plan for 2010 and onwards.

### **Pipeline Projects and Emerging Needs for Preparation of Future Project Proposal**

42. Noted that there are 4 pipeline projects are still under discussion and being in the negotiation process with donor agencies, including: (1) *Community Fisheries – Strengthening Organization of Communities for Sustainable Livelihoods in Coastal Areas* (SEC/Islamic Development Bank-IDB); (2) *Human Resource Development on Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region* (SEC/ASEAN Foundation); (3) *Awareness Building on sustainable Development of Fisheries in the ASEAN Region*



(SEC/ASEAN Foundation); and (4) *Transboundary Collaborative Arrangement Supporting Aquatic Resources and Habitat Management for Sustainable Fisheries* (TD/Wetland Alliance).

43. With regards to the program on *Community Fisheries – Strengthening Organization of Communities for Sustainable Livelihoods in Coastal Areas*, Indonesia will submit the proposal to IDB, and appoint the focal point to follow-up this matter.

44. Regarding to the program on *HRD on Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region*, the agreement between SEAFDEC and ASEAN foundation is expected to be signed by the end of 2007 or early 2008, and the detailed project activities will be discussed and finalized at the Project Inception Meeting to be held in 2008.

45. Regarding to the program on *Awareness Building on Sustainable Development of Fisheries in the ASEAN Region*, noted that the proposal is now in preparatory process, and subject to be submitted for comments and consideration by ASEAN Foundation.

46. Suggested that in order to seek more funding support from donor agencies, the issues of human resources development, poverty alleviation, and gender issues, etc. should be given more emphasis.

#### **Establishment of Regional Scientific Advisory Committee for Fisheries Management in Southeast Asia (RSAC)**

47. The proposal on Establishment of RSAC was reviewed and adopted. Noted that RSAC is proposed to serve as subsidiary body of the SEAFDEC Council by providing a regional framework and scientific/technical advice and options for improving fisheries management. Suggested that the outcome of the discussion on the proposal at this Meeting would be submitted to the Meeting of the SEAFDEC Council for consideration.

#### **Other Matters**

48. SEAFDEC was requested to disseminate of outcomes of the Departmental Programs through Websites, and to provide information on the training courses to the Member Countries in advance.

49. To effectively implement the programs in a holistic approach and to facilitate sourcing of funds, SEAFDEC was requested to establish a clear program framework, outlining directions or thrusts for the programs/activities formulation, by considering SEAFDEC competence and priorities/needs of the Members. Considered that RSAC can be a program thrust for fisheries management. The Meeting requested that the SEAFDEC program framework should be drafted and submitted to the next meeting of the Program Committee for consideration.

50. Suggested that the presentations during the future meetings of the Program Committee should be simple and concise by avoiding technical terms and too detailed information, focusing only on the main results of the programs.



## CONTENTS

	<b>Paragraph No.</b>
<b>I. INTRODUCTION</b>	1
<b>II. OPENING OF THE MEETING</b>	2-3
<b>III. ADOPTION OF THE AGENDA</b>	4
<b>IV. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2007 AND PROPOSED PROGRAMS FOR THE YEAR 2008</b>	
4.1 Departmental Programs	5-15
4.2 Programs under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) Mechanism	16-39
4.3 Other Programs	40-47
4.4 Overview of Japanese Trust Fund Programs for 2008	48-51
<b>V. PIPELINE PROJECTS AND EMERGING NEEDS FOR PREPARATION OF FUTURE PROJECT PROPOSALS</b>	52-56
<b>VI. OTHER MATTERS</b>	
6.1 Establishment of Regional Scientific Advisory Committee for Fisheries Management in Southeast Asia (RSAC)	57-62
6.2 Others	63-65
<b>VII. RECOMMENDATIONS OF THE THIRTIETH MEETING OF THE PROGRAM COMMITTEE</b>	
7.1 Adoption of Report of the Meeting	66
7.2 Date and Venue of the Thirty First Meeting of the Program Committee	67
<b>VIII. CLOSING OF THE MEETING</b>	68

## ANNEXES

<b>Annex</b>		<b>Page</b>
1.	List of Participants	13
2.	Opening Statement by Dr. Siri Ekmaharaj, SEAFDEC Secretary-General	21
3.	Agenda	23
4.	SEAFDEC Departmental Programs of Activities for the Year 2007-2008	25
5.	Programs of Activities under ASEAN-SEAFDEC Fisheries Consultative Group for the Year 2007-2008	87
6.	Other Programs/Activities Implemented by SEAFDEC	237
7.	Overview of Japanese Trust Fund Programs for 2008	251
8.	Review Of SEAFDEC Pipeline Projects	255
9.	Draft Proposal on the Establishment of SEAFDEC Regional Scientific Advisory Committee on Fisheries Management in Southeast Asia (RSAC)	265
10.	Closing Speech by Dr. Siri Ekmaharaj, SEAFDEC Secretary-General	269

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

**Iloilo City, the Philippines  
26-28 November 2007**

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**I. INTRODUCTION**

1. The Thirtieth Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Iloilo City, the Philippines from 26 to 28 November 2007, and hosted by the Aquaculture Department. The Meeting was attended by the National Coordinators from Brunei Darussalam, Cambodia, Indonesia, Japan, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam as members of the Program Committee together with their respective delegates. The SEAFDEC Secretary-General, Deputy Secretary-General, Department Chiefs and Deputy Chiefs as ex-officio members also attended the Meeting together with officers from the Secretariat and the Departments. The List of Participants appears as **Annex 1**.

**II. OPENING OF THE MEETING**

2. The Secretary-General of SEAFDEC, Dr. Siri Ekmaharaj, in his capacity as Chairman of the Program Committee, welcomed the participants to the Meeting. He cited the importance of the discussions at this Meeting, particularly in scrutiny of the SEAFDEC programming exercises to ensure that issues and concerns of the Member Countries would be reflected in the programs. He also informed the Meeting of several SEAFDEC achievements during the year 2007, i.e. the SEAFDEC 40<sup>th</sup> Anniversary celebration, the Margarita Lizárraga Medal awarded to SEAFDEC by FAO as a global recognition of the SEAFDEC activities in support to the implementation of the Code of Conduct for Responsible Fisheries (CCRF) in Southeast Asia, and the strengthened cooperation between SEAFDEC and ASEAN through the ASEAN-SEAFDEC Strategic Partnership (ASSP).

3. Dr. Siri announced and congratulated the appointment of Ms. Mahyam Mohd. Isa as the new Chief of SEAFDEC Marine Fishery Resources Development and Management Department (MFRDMD). He then declared the Meeting open. His Opening Address appears as **Annex 2**.

**III. ADOPTION OF THE AGENDA**

4. The Agenda which appears as **Annex 3** was adopted. To utilize the opportunity of this Program Committee Meeting, the Meeting also agreed that the proposal on the Establishment of SEAFDEC Regional Scientific Advisory Committee on Fisheries Management in Southeast Asia (RSAC) could be discussed as part of the Agenda at this Meeting.

**IV. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR  
2007 AND PROPOSED PROGRAMS FOR THE YEAR 2008**

**4.1 Departmental Programs**

5. The Meeting took note of the existing Departmental Programs implemented in 2007 and proposed for 2008 including new programs for 2008 (**Annex 4**). The Meeting endorsed the programs after recommending ways and means to ensure that such programs address the needs

of the Member Countries and also noted that MFRD and MFRDMD did not implement any Departmental Programs in 2007 nor propose for 2008 due to the unavailability of extra funding. The programs are as follows:

***Existing Departmental Programs***

- 1) Center-wide Information Network (Secretariat)
- 2) Information and Communications Technology (TD)
- 3) Integrated Mollusc Production (AQD)
- 4) Mud Crab and Shrimp Domestication (AQD)
- 5) Marine Fish (AQD)
- 6) Small-holder Freshwater Aquaculture (AQD)
- 7) Seaweed Strain Improvement (AQD)
- 8) Aquatic Ecology (AQD)
- 9) Other Research & Development Activities

***New Proposed Departmental Program***

- 1) Tailor-made Training and Study Tour (TD)

6. With regards to the program on *Center-wide Information Network*, the Meeting was informed that the program's budget comes from the Minimum Regular Contribution (MRC) and that the Regional Fisheries Policy Network (RFPN) members stationed at the Secretariat is being funded by the collaborative projects between SEAFDEC and the Swedish International Development Cooperation Agency (Sida). However, the expenses on communication for the RFPN members with the Member Countries are covered by the program.

7. The Committee Member from Thailand supported the establishment of the Global Small-Scale Fisheries Website. The Meeting was informed that information on small-scale fisheries from the other regions would also be included in the website as the information would be useful for the development of small-scale fisheries in the region and as reference during the forthcoming Small-scale Fisheries Conference to be convened in Bangkok in 2008. In this regard, the Meeting was also informed that regional websites on small-scale fisheries are also being constructed by respective Regional Fishery Bodies to support the global small-scale fisheries website.

8. With regards to the comments of the Committee Member from the Philippines, there is a need for the compilation and production of timely and accurate Fishery Statistical Bulletins. The Meeting was informed that the new framework of fishery statistics in Southeast Asia will be finalized during the forthcoming Regional Technical Consultation on Fishery Statistics to be organized in December 2007 under the ASEAN-SEAFDEC Fishery Consultative Group program on *Improvement of Fishery Statistics and Information for Planning and Management of Fisheries in the ASEAN Region*. In addition, the questionnaires for the compilation of fishery statistics in Southeast Asia will be harmonized and streamlined with those of the FAO to lessen the burden of the Member Countries in providing fishery statistics to SEAFDEC and FAO. This will facilitate timely production of the Bulletin.

9. With regards to the collaboration between TD and the Australian Maritime College (AMC) to develop a Master's Degree Program through e-learning, the Meeting noted the progress that included the formulation of the curriculum focusing on Responsible Fishing, Coastal Fisheries Management, and Ecology and that the curriculum is now being reviewed by AMC for finalization. The Meeting was also informed that the estimated cost for participating in this course would be only about one third of the cost for taking the same course in Australia. In this regard, the Meeting suggested that certain number of scholarships may be provided to the Member Countries to encourage their participation to the said course. The Meeting requested that the progress made be reported to the next meeting of the Program Committee.

10. The Meeting also suggested that since many activities related to data and information are implemented under several programs, the overall framework and linkages of such relevant programs should be provided to the Committee Members. In this regard, the forthcoming Workshop on Fisheries Information and Database to be organized by TD could be an appropriate opportunity to discuss this matter, and the outcomes should be summarized and presented at the next Program Committee Meeting.

11. The Committee Member from the Philippines suggested that the issue on climate change and its impacts to fisheries, aquaculture and the ecology should also be given due consideration. He further requested TD to compile and disseminate information on the impacts under the program on *Information and Communications Technology*. The Meeting was informed that information related to global warming and its effect on fisheries is in the process of a video production by TD in collaboration with the UNEP/GEF South China Sea environment program.

12. With regards to the Departmental Programs of AQD, the Committee Member from Myanmar requested AQD to extend again its assistance to Myanmar, i.e. technical assistance for conservation and management of mud crab, technology transfer on mud crab fattening, Good Aquaculture Practice (GAP) for freshwater species, e.g. tilapia to meet the requirements of importing countries, and on culture of high value species of marine fishes, e.g. grouper. In response, AQD suggested to provide assistance in 2008 under the sustainable aquaculture development project in Myanmar considering the same level of assistance as that of 2007, which was suspended due to the US sanction imposed on Myanmar.

13. In response to the request of the Committee Member from Vietnam on the mechanism regarding AQD's Agree-Build-Operate-Transfer (ABOT) project and that such mechanism should be extended to other Member Countries, AQD agreed to communicate with Vietnam on the procedures and necessary arrangements of the ABOT project.

14. The Meeting supported the proposed new Departmental Program on *Tailor-made Training and Study Tour*. While noting that the program will be funded from extra-budgetary sources, the Meeting requested that the activities should also accommodate the regional requirements.

15. The Meeting suggested that although the SEAFDEC Departmental Programs are supported by the Governments hosting the Departments and non-traditional sources of funds, such programs should be regional in nature, reflecting regional priority and providing benefits to the Member Countries. The Meeting also took note of the suggestion by the Committee Member from Indonesia for the Secretariat and Departments to demarcate their responsibilities in submitting proposals for the Departmental Programs.

#### **4.2 Programs under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) Mechanism**

16. For the programs under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) Mechanism, the Meeting considered and endorsed progress and achievements made in the year 2007 and proposed activities for 2008, including the new programs proposed for 2008, which appears as **Annex 5**. These programs are as follows:

##### ***Existing ASEAN-SEAFDEC FCG Programs***

- 1) Regionalization of the Code of Conduct for Responsible Fisheries (Secretariat)
- 2) Assistance of Capacity Building in the Region to Address International Trade Related Issues (Secretariat)

- 3) Strengthening Small-scale Fisheries Management through the Promotion of Rights-based Fisheries and Co-management (TD)
- 4) Improvement of Fishery Statistics and Information for Planning and Management of Fisheries in the ASEAN Region (Secretariat)
- 5) Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature) (TD)
- 6) Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement (TD)
- 7) Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses (TD)
- 8) The Use of Indicators for sustainable Development and Management of Capture Fisheries in the ASEAN Region (MFRDMD)
- 9) Development of Integrated Inland Fisheries Management in ASEAN Countries (MFRDMD)
- 10) Development of Technologies and Human Capacity Building for Sustainable Aquaculture (AQD)
- 11) Quality Assurance Systems for Small and Medium-sized Fish Processing Establishments in ASEAN Member Countries (MFRD)
- 12) Utilization of Freshwater Fish in ASEAN Member Countries (MFRD)
- 13) Good Laboratory Quality management in ASEAN Member Countries (MFRD)
- 14) Environmental Related Tasks in Southeast Asia (Secretariat)
- 15) Establishment of Disease Surveillance System of Aquatic Animals (AQD)
- 16) Chemical and Drug Residues in Fish and Fish Products in Southeast Asia (MFRD)
- 17) Research and Development (R&D) of Stock Enhancement of Species under International Concerns (AQD)
- 18) Research for Stock Enhancement of Sea Turtles (MFRDMD)
- 19) Capacity Improvement of Fisheries community for Fisheries Management and Alleviation of Poverty (TD)
- 20) Support to Tsunami Rehabilitation of Affected Countries in the ASEAN Region (Secretariat)
- 21) Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2 (TD)
- 22) Deep Sea Fisheries Resources Exploration in the Southeast Asia (TD)
- 23) Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea (MFRDMD)

***New Proposed ASEAN-SEAFDEC FCG Programs***

- 1) Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in ASEAN Region (Secretariat)
- 2) Development of Regional Database for Fishery Management (TD)
- 3) Information Collection of Highly Migratory Species in Southeast Asia Waters (TD)

**Secretariat**

17. While noting that in 2008, the program on *Regionalization of the Code of Conduct for Responsible Fisheries* will be renamed to *Support to the Implementation of the Code of Conduct for Responsible Fisheries in the ASEAN Region*, the Meeting complimented the efforts made by SEAFDEC and the Member Countries in implementing the program and congratulated SEAFDEC for receiving the Margarita Lizarraga Medal Award (2006-2007) for its efforts in the promotion of responsible fisheries in Southeast Asia. The Meeting requested SEAFDEC to continue to provide assistance to the Member Countries in the implementation of the CCRF, including the development of regional guidelines to facilitate the implementation of Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating IUU fishing in the Region.



18. On the program on *Assistance of Capacity Building in the Region to Address International Trade Related Issues*, the Meeting was informed that a Regional Technical Consultation on International Fisheries-Related Issues would be organized by SEAFDEC in early 2008. The outcomes of the Consultation would be submitted to the forthcoming SEAFDEC Council and the ASEAN Sectoral Working Group on Fisheries (ASWGFi) Meetings for consideration, and to be used as a basis for the Member Countries' participation to the FAO Sub-Committee on Fish Trade to be organized in June 2008.

19. The Meeting suggested that important fisheries-related issues i.e. climate change, fishery subsidies, traceability, small-scale fisheries as well as other issues to be discussed at the FAO Sub-Committee on Fish Trade and Sub-committee on Aquaculture in 2008 should be incorporated in the program. The Meeting also reiterated that the program should be developed considering the existing SEAFDEC competence on the issues.

20. With regards to the program on *Improvement of Fishery Statistics and Information for Planning and Management of Fisheries in the ASEAN Region*, the Committee Member from Thailand expressed the willingness of Thailand to be one of the pilot countries for the development of the National Status and Trends of Fisheries and Aquaculture (STF) in 2008.

21. Regarding the program on *Environmental Related Tasks in Southeast Asia*, the Committee Member from Japan requested SEAFDEC to continue its activities on the conservation and management of sharks and support the development of NPOA-Sharks by the Member Countries, as shark species may be subjected for listing in appendices at the next Conference of Parties of the Convention on Trade in Endangered Species of Wild Flora and Fauna (CITES) in 2010. In line with this, the Committee Member from Vietnam also requested SEAFDEC to provide assistance in organizing a national planning meeting to draft the National Plan of Action on Conservation and Management of Sharks.

22. With regards to the new program on *Promotion of "One Village, One Fisheries Products (FOVOP)" System to Improve the Livelihood for the Fisheries Communities in ASEAN Region*, the Meeting was informed that the Project Inception Meeting will be organized in early 2008, and that the detailed activities under the program would be discussed during the said Inception Meeting.

23. The Meeting took note of the "International Conference on Securing Sustainable Small-scale Fisheries: Bring together responsible fisheries and social development" to be organized by FAO and co-hosted by Thailand in collaboration with SEAFDEC and the WorldFish Center. The tentative themes for discussion are: 1) Human Rights, 2) Fishing Rights, and 3) Post-harvest Technology and Trade. In this regard, the Meeting requested SEAFDEC to actively involve in the Conference, e.g. delivering the keynote speech at the Conference, arranging small panel discussions, putting up of exhibition booths and disseminating information materials as well as having strong intervention during the Meeting.

### **Training Department**

24. Regarding the program on *Strengthening Small-scale Fisheries Management through the Promotion of Rights-based Fisheries and Co-management*, the Meeting was informed that the program will be replaced by the program on *Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management* starting in 2008.

25. On the *Responsible Fishing Technologies and Practices* program, the Committee Member from the Philippines informed the Meeting that the Philippines has already completed a series of experiments on the use of JTEDs in various areas of the country. The policy on the

use of JTEDs has been drafted and consultations among stakeholders will be conducted before its approval. The Philippines would also conduct experiment of a new gear for shrimp trawlers, which are used by small-scale fishermen. The meeting was further informed that the outcomes of this experiment would be reported during the forthcoming meetings of the Program Committee and be disseminated to all Member Countries. However, the assistance from TD was sought in the implementation of such experiment. The Meeting was also informed of the completion of publication on Fishing Gear and Methods in Brunei Darussalam which is ready for distribution.

26. The Committee Member from the Philippines also commended the success of TD in implementing the program on *Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement*, which are now replicated in several areas of the Philippines, and requested that the activities under this program should be continued.

27. With regards to the program on *Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2*, the Committee Member from Myanmar requested TD to conduct a bottom vertical longline survey in the untrawlable fishing grounds in Myanmar. He informed the Meeting that his country has already imposed closed season and closed areas for fish conservation purposes as well as restrictions on mesh size of trawlers and drift nets, and banned the use of illegal fishing practices. In this connection, he reiterated the request of Myanmar for technical assistance from TD to conduct a survey in the area where the closed season for the set net has been implemented and that he would communicate with TD on the required activities to be incorporated under the program. The Committee Member from Vietnam requested to extend deadline of finalization of proposals for the use of M.V. SEAFDEC 2 until the end of 2007.

28. Regarding the program on *Information Collection of Highly Migratory Species in Southeast Asian Waters*, the Committee Member from Vietnam requested that TD should try to collect information from all countries bordering the South China Sea in implementation of the program.

29. As for the new program on *Development of Regional Database for Fishery Management*, the Committee Member from Thailand supported the development of a regional database system which is envisaged to be very useful for fisheries management, and suggested that the database directory should be established. The Member Countries could agree on minimum data requirements and provide their list of databases to the directory. In addition, he also proposed that Thailand could serve as the lead country for database directory establishments.

### **Marine Fisheries Research Department**

30. With regards to the program on *Chemical and Drug Residues in Fish and Fish Products in Southeast Asia*, the Meeting took note that the project activities would be completed by the end of 2008. In this connection, the Meeting requested MFRD to explore possibility to extend the program beyond 2008. The Committee Member from the Philippines informed the Meeting of their interests to collaborate, as activities on analysis of antibiotic residues in aquaculture products are currently being implemented by the Bureau of Fisheries and Aquatic Resources.

31. The Committee Member from Myanmar informed the Meeting that in relation to the implementation of the ASEAN Roadmap for Integration of Fisheries Sector specifically on food safety, the Department of Fisheries of Myanmar has been tasked to effectively implement laws, updated regulations, and standards in line with the requirements of importing countries for fish and fishery products as well as for traditional fishery products for local consumption. In order for Myanmar to comply with such requirements, he therefore requested MFRD to provide

technical assistance, e.g. dispatch the expert specifically on the harmonization of food safety practices in the ASEAN region as well as in the implementation of management systems such as the Hazard Analysis of Critical Control Points (HACCP) and Good Manufacturing Practices/Sanitation Standard Operating Procedures (GMP/SSOP) guidelines.

### **Aquaculture Department**

32. With regards to the program on *Research and Development (R&D) of Stock Enhancement of Species under International Concerns*, the Committee Member from Thailand suggested that the involvement of the Member Countries in the program should be intensified through the conduct of a regional workshop to assess the existing methodologies.

33. With regards to the *Development of Technologies and Human Capacity Building for Sustainable Aquaculture*, the Committee Member from Vietnam requested that funds to support the participation of the Member Countries in such training courses should also be provided, e.g. from the Japanese Trust Fund.

34. Regarding the AQD programs, the Committee Member from Myanmar informed the Meeting that the mud crab resource in Myanmar is almost over-exploited due to high demand from the importing countries and irresponsible fisheries practices and that the exploitation rate of mud crab is increasing while the size of landing is getting smaller. For conservation purpose, the country has banned the export of under-sized mud crabs and encourages the release of under-sized mud crabs to the natural waters. In this regard, he reiterated his request for the transfer of technology on mud crab fattening as this would be an effective way to nurse the under-sized mud crab collected from the landing sites into marketable size. He added that technical assistance could be in the form of experts visit, training for trainers, etc. which could be essential to address the concerns of the country's mud crab industry.

35. In order to strengthen the implementation of activities on sustainable aquaculture development, the Meeting suggested AQD to coordinate closely with the Network of Aquaculture Centres in Asia-Pacific (NACA) on areas of common interest.

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

36. With regards to the program on *Research for Stock Enhancement of Sea Turtles*, the Committee Member from the Philippines suggested that follow-up actions be conducted on the interaction between sea turtles and fisheries, and that the Philippines intend to participate in the satellite telemetry and turtle tagging programs conducted by SEAFDEC. While agreeing with the suggestion, the Committee Member from Brunei Darussalam suggested that this turtle program should be implemented in all Member Countries where possible.

37. The Committee Member from Myanmar requested that activities on the installation of Platform Transmitter Terminals (PTTs) should be continued in Myanmar for Olive Ridley Turtle and Green Turtle in order to observe their nesting and foraging habitats. He informed the Meeting on the need to conduct awareness and educational program for the local people and the fishermen in various sites of the country to make them aware on the importance of sea turtles and for them to avoid killing the sea turtles.

38. The Committee Member from the Philippines expressed his appreciation of the activities implemented under the program on *Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea*, and informed the Meeting that the Philippines would further communicate with MFRDMD and TD on the activities to be proposed by the Philippines for 2008.

39. The Meeting noted that there are inactive programs but considered important for the Member Countries and fisheries development of the region. The Meeting requested SEAFDEC Secretariat and Departments to seek funding support from possible donors e.g. the Asian Development Bank (ADB), the Australian Centre for International Agricultural Research (ACIAR), etc., in order to address such important issues. The Meeting also agreed that tailor-made activities may be arranged to address the priorities and requirements of the Member Countries, if funding is available/provided. The Meeting agreed that in order to secure these financial supports, the forthcoming Department Chiefs' Meeting (DCM) will explore the potential sources of funds through the arrangement of one day special seminar on the issue. The Meeting therefore recommended dropping the following programs until funding becomes secured:

- The Use of Indicators for sustainable Development and Management of Capture Fisheries in the ASEAN Region (MFRDMD);
- Development of Integrated Inland Fisheries Management in ASEAN Countries (MFRDMD);
- Utilization of Freshwater Fish in ASEAN Member Countries (MFRD); and
- Good Laboratory Quality Management in ASEAN Member Countries (MFRD).

#### 4.3 Other Programs

40. The Meeting took note of the other SEAFDEC programs/activities implemented in 2007 and proposed for 2008 (**Annex 6**), as follows:

- 1) Promotion of Set-Net; an Eco-friendly Fishing Gear of Sustainable Coastal Fisheries Management (TD)
- 2) Information Collection for Economical Important Species: as Surimi Raw Materials (TD)
- 3) Cetacean Research in Southeast Asian Waters: Whale Watching Program (new) (TD)
- 4) Collection of Information about International Support in the Region (TD)
- 5) Promotion of Sustainable Freshwater Aquaculture for Rural Communities (Secretariat)

41. With regards to the program on *Promotion of Set-Net an Eco-friendly Fishing Gear of Sustainable Coastal Fisheries Management*, the Meeting took note of the Workshop on Set Net to be organized by the Department of Fisheries of Thailand in collaboration with the Japan International Cooperation Agency (JICA) and TD in 2007, in Rayong Province, Thailand. The Meeting was informed that TD has planned to conduct a fellowship training on eco-friendly fishing gear for representatives from the Member Countries in April 2008.

42. With regards to the program on *Information Collection for Economical Important Species: as Surimi Raw Materials*, the Meeting suggested that in addition to the collection of information on the fishery resources, investigation on new species as Surimi raw materials should also be conducted. In addition, the use of species from inland capture fisheries and aquaculture for Surimi production should also be studied. In this connection, TD was requested to further collaborate with MFRD and AQD in the implementation of such activities based on the availability of fund.

43. With regards to the program on *Cetacean Research in Southeast Asian Waters: Whale Watching Program*, the Meeting took note that the activities would be conducted to collect scientific information on Cetacean species composition. The Meeting was also informed that the data would be collected using the M.V. SEAFDEC 2 based on her existing cruise plans. The Committee Member from Cambodia requested SEAFDEC to also include the collection of information on freshwater porpoises for conservation purposes.

44. While considering the program proposal, the Meeting indicated that the objectives, expected outputs and proposed activities were unclear and requested TD to provide relevant information of the program for further review by the Member Countries.

45. While noting the importance of the information collection as the results would provide a picture of the funding support provided to various scopes of fisheries-related programs/activities in the Member Countries, the Meeting supported the implementation of the program on the *Collection of Information about International Support in the Region*, and requested to take further efforts to comprehensively collect additional information from other missing sources e.g. the Asian Development Bank (ADB), the Norwegian Agency for Development Cooperation (Norad), the Danish International Development Assistance (Danida), the Swedish International Development Cooperation Agency (Sida), Japan, etc. The result of information update will be reported to the next meeting of the Program Committee.

46. The Meeting took note of the program on *Promotion of Sustainable Freshwater Aquaculture for Rural Communities*, which has been implemented by the Secretariat as an ad-hoc project to reduce development disparity among Member Countries, with emphasis given to countries that inland fisheries and freshwater aquaculture are important for rural development. The Meeting was also informed that the nature activities implemented focuses mainly on coordination and mobilization of expertise and experience from AQD, the Member Countries and relevant international/regional organizations in the region.

47. The Meeting supported the program and the suggestion of the Committee Members from Thailand and Indonesia as there are limited number activities at present focusing on inland fisheries and freshwater aquaculture. The Committee Member from Cambodia also reiterated that inland fisheries and freshwater aquaculture play very important roles in many countries in the region, e.g., Lao PDR and Cambodia. The Meeting therefore suggested that programs aiming at development of rural communities e.g. aquaculture and fisheries in inland waters could be proposed under the ASSP framework to the forthcoming ASEAN-SEAFDEC FCG and ASWGFi Meetings for consideration.

#### **4.4 Overview of Japanese Trust Fund Programs for 2008**

48. The Meeting was informed on the Overview of the Japanese Trust Fund Program for 2008 (**Annex 7**) and noted that the implementation of the Japanese Trust Fund (JTF) projects and activities is in line with priorities and needs of the Member Countries. Furthermore, the Meeting was also informed that the SEAFDEC Program Planning Meeting for the Japanese Trust Fund for 2008 and Onwards was organized in Thailand in June 2007. In the Program Planning Meeting some of the proposals submitted to the Meeting, which were considered to meet the JTF criteria and the objectives of relevant JTF components have been accommodated in the SEAFDEC regional programs to be implemented in 2008 under the new JTF2 and JTF3 and JTF4.

49. The Meeting expressed its appreciation to the support provided by the Japanese Trust Fund and suggested that the Japanese Trust Fund should continue to provide a clear scope and priority areas of each JTF Component to the Member Countries to facilitate understanding of the JTFs among the Member Countries.

50. In the finalization of the Japanese Trust Fund Program for 2008, the Program Lead Departments had been already requested to consider and reflect the suggested changes into the annual plan and submit the revised annual plan to the Secretariat by 5 December 2007 for submission as early as possible to the Fisheries Agency of Japan.

51. In addition to the annual plan for 2008, the formulation of the new JTF5 is now under the process of finalization and submission to the Secretariat by the Lead Departments by the first quarter of 2008 for negotiation with the Japanese Government. The Program Lead Departments are requested to coordinate with the Lead Countries as well as the participating countries in finalizing the project proposals before submission to the Secretariat. After the approval of the budget for the Japanese Fiscal Year 2009, a Program Planning Meeting for the TF5 may be organized in 2009, for the Member Countries to discuss the activities to be implemented in 2010 and onwards, while the Member Countries could also communicate directly with the SEAFDEC Secretariat and Departments on the activities of interest.

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

52. The Meeting took note of a number of pipeline projects (**Annex 8**) which are still under discussion and negotiation process with donor agencies, as follows:

- 1) Community Fisheries – Strengthening Organization of Communities for Sustainable Livelihoods in Coastal Areas (Secretariat/Islamic Development Bank-IDB)
- 2) Human Resource Development (HRD) on Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region (Secretariat/ASEAN Foundation)
- 3) Awareness Building on sustainable Development of Fisheries in the ASEAN Region (Secretariat/ASEAN Foundation)
- 4) Transboundary Collaborative Arrangement Supporting Aquatic Resources and Habitat Management for Sustainable Fisheries (TD/Wetland Alliance Program)

53. With regards to the program on *Community Fisheries – Strengthening Organization of Communities for Sustainable Livelihoods in Coastal Areas*, the Concept Proposal has been prepared by the Secretariat, and Indonesia was requested to submit the proposal to IDB and appoint the focal point to follow-up this matter. The Meeting suggested that in the elaboration of the project proposal, activities in inland areas could also be looked into.

54. With regards to the program on *Human Resource Development (HRD) on Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region*, the proposal is under finalization process by the ASEAN Foundation and the project agreement is expected to be signed by the end of 2007 or early 2008. However, the detailed project activities would be discussed and finalized at the Project Inception Meeting to be held in 2008.

55. With regards to the program on *Awareness Building on Sustainable Development of Fisheries in the ASEAN Region*, the Meeting noted that the proposal has been prepared upon the request of the ASEAN Foundation, and will be submitted to the ASEAN Foundation for comments and consideration.

56. The Meeting suggested that in order to seek more funding support from donor agencies, the issues of human resources development, poverty alleviation, and gender issues, etc. should be given more emphasis.

## **VI. OTHER MATTERS**

### **6.1 Establishment of Regional Scientific Advisory Committee for Fisheries Management in Southeast Asia (RSAC)**

57. The Meeting reviewed the draft proposal on Establishment of Regional Scientific Advisory Committee for Fisheries Management in Southeast Asia (RSAC), however stressed that RSAC is not part of the Program Committee although the outcome of the discussion on the proposal at this Meeting would be submitted to the forthcoming Meeting of the SEAFDEC Council for consideration.

58. Since there was no consensus on the proposal to include in the Terms of Reference of RSAC “to advise on the delineation and coordination among the SEAFDEC programs related to fisheries management”, the Meeting suggested that such proposal will be subject to further reviews by the SEAFDEC Council. The Meeting also suggested that there should be communication between RSAC and the Program Committee.

59. Considering that RSAC is proposed to be established as a subsidiary body to the SEAFDEC Council to provide a regional framework for discussion and provide scientific/technical advice and options for improving fisheries management, the Meeting pointed out that outcomes from the existing SEAFDEC programs could be used as inputs for RSAC to analyze and formulate scientific/technical advice to SEAFDEC Council. In addition, the recommendations of RSAC would also form as guiding principles for the formulation and harmonization of the activities related to fisheries management for implementation by SEAFDEC.

60. The Meeting agreed that the Chairman of RSAC will be elected from the representatives of the Member Countries on an annual rotational basis. The Committee Member from Singapore further suggested that membership of RSAC should have a fixed term. The Meeting also requested the Secretariat to furnish the Member Countries the proposed organizational structure to be discussed with their Council Directors before the next meeting of the Council.

61. The Meeting noted the concern expressed by some Member Countries on the potential implication of RSAC to existing SEAFDEC Minimum Regular Contribution (MRC) and therefore requested the Secretariat to prepare a detailed information to facilitate discussion and consideration at the Council Meeting including the amount of financial requirement from the MRC for the organization of RSAC meetings, both under option 1 (to be fully fund by the MRC) and option 2 (to be partially funded by the MRC).

62. The Meeting, after deliberation, adopted the Draft Proposal on Establishment of Regional Scientific Advisory Committee for Fisheries Management in Southeast Asia (**Annex 9**), to be submitted to the SEAFDEC Council for consideration.

### **6.2 Others**

63. The Meeting requested that information and publications on the outcomes of the SEAFDEC Departmental Programs should be disseminated to all Member Countries specifically through the Departmental Websites. The Meeting also requested that information on the training courses to be organized by SEAFDEC should be provided to the Member Countries in advance to allow time for the Member Countries to make the necessary arrangements for their participation in the courses.

64. The Committee Member from Thailand suggested that in order that all programs are implemented in a holistic approach and to facilitate sourcing of funds for the implementation of the activities, a clear SEAFDEC program framework (or guiding principle), outlining directions or thrusts for the formulation of programs/activities should be established. The program framework should take into consideration the technical competence of SEAFDEC as well as the priorities and needs of the Member Countries in fisheries development and management. Along this line, RSAC can be considered as a program thrust for fisheries management to comprehensively review the existing management related programs/projects to find duplicated and/or missing priority area to have a holistic view of SEAFDEC fisheries management related programs. The Meeting requested that the draft SEAFDEC program framework be submitted to the next meeting of the Program Committee for consideration.

65. The Meeting also suggested that the presentations during the future meetings of the Program Committee should be simple and concise by avoiding technical terms and too detailed information, focusing only on the main results of the programs.

## **VII. RECOMMENDATIONS OF THE THIRTIETH MEETING OF THE PROGRAM COMMITTEE**

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

66. The Committee adopted the report of the Thirtieth Meeting on 28 November 2007, which would be submitted to the next SEAFDEC Council Meeting and high authority of ASEAN through the ASEAN-SEAFDEC Fisheries Consultative Group (FCG).

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

67. The Chief of MFRD expressed her Department's willingness to host the Thirty-first Meeting of the Program Committee in Singapore. She would further seek the guidance of the Secretariat in finalizing the schedule and related arrangements for the Meeting including the date and venue of the Meeting.

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

68. In his Closing Remarks, SEAFDEC Secretary-General, Dr. Siri Ekmaharaj, in his capacity as Chairman of the Program Committee, thanked the Committee Members and other participants for their active participation and contributions to the Meeting. He then declared the Meeting closed. His closing speech appears as **Annex 10**.



**Annex 1**

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## OPENING STATEMENT

*By Dr. Siri Ekmaharaj, SEAFDEC Secretary-General*

Distinguished Members of the SEAFDEC Program Committee,  
Deputy Secretary-General,  
SEAFDEC Department Chiefs, and Senior Officials,  
Representatives from Partner Organizations,  
Ladies and Gentlemen,

Good morning and welcome to the Thirtieth Meeting of the SEAFDEC Program Committee. Before we start I would like to thank AQD for hosting this year's Meeting, which is significant because of many reasons.

Firstly, we will review during this meeting the implementation of various activities that are funded through non-regular funding sources. We must recall that during the 29<sup>th</sup> Meeting of the Program Committee in 2006, I announced that the programming exercises starting in 2007 will be influenced by the policy change in the annual contribution to SEAFDEC from traditional donors. This is therefore an opportune time for us to review the impact of such policy change on the programs of SEAFDEC and importantly to identify ways to improve the program scrutiny by the Committee.

Secondly, this year SEAFDEC will turn 40 and many activities have already been promoted since the 39<sup>th</sup> Meeting of the SEAFDEC Council in April 2007. For the information of everybody, TD will celebrate the SEAFDEC 40<sup>th</sup> Anniversary by way of an Open House of its facilities during the last week of December. The Secretariat has been promoting the achievements of SEAFDEC through the various promotional materials produced during the past few months. I am sure the other Departments have also their respective activities to commemorate the 40 years of SEAFDEC's existence in the region.

Thirdly, as relayed earlier to the SEAFDEC Member Countries, SEAFDEC is the recipient of the Margarita Lizárraga Award for the biennium 2006-2007 given by FAO for our efforts in promoting the implementation of the Code of Conduct for Responsible Fisheries in the region.

Together with Dr. Kato and on behalf of SEAFDEC and the Member Countries, I received the Medal and Award Certificate last week in Rome. This Award is for all of us, for the whole SEAFDEC family, and for all our efforts in promoting responsible fisheries in our respective countries and in the region.

Finally, it is also in 2007 that we have formally strengthened our relationship with the ASEAN. Early this month during the 29<sup>th</sup> SOM-AMAF held in Bangkok, the Letter of Understanding formalizing the ASEAN-SEAFDEC Strategic Partnership or ASSP was signed by SEAFDEC and the ASEAN Secretariat. The ASSP is envisaged to pave the way for strengthened cooperation between SEAFDEC and the ASEAN, and herald a new phase of ASEAN-SEAFDEC collaboration for the benefit of our member countries.

This year's Program Committee Meeting is therefore very important and as the Chairman of the Program Committee I would wish to request for your full cooperation and active participation in the discussions to ensure that the needs of the Member Countries are considered in the programming and implementation of the SEAFDEC activities.

The outcome of this Meeting including the recommendations will be submitted to the forthcoming Meeting of the SEAFDEC Council for final endorsement through the 10<sup>th</sup> ASEAN-SEAFDEC Fisheries Consultative Group Meeting which will be convened starting on Thursday of this week.

Being a subsidiary body of the SEAFDEC Council, the Program Committee should carefully scrutinize the SEAFDEC programs of activity, to make sure that issues and concerns that hold back the sustainable development of fisheries in the region, are addressed through such programs.

With this note, I wish to declare the 30<sup>th</sup> Meeting of the SEAFDEC Program Committee open. Thank you and good day!

## AGENDA

- Agenda 1** Opening of the Meeting
- Agenda 2** Adoption of Agenda and Arrangement of the Meeting
- Agenda 3** Review of SEAFDEC Program Implementation for the Year 2007 and Proposed Programs for the Year 2008
- 3.1 Departmental Programs<sup>1</sup>
    - 3.1.1 Secretariat
    - 3.1.2 Training Department
    - 3.1.3 Aquaculture Department
  - 3.2 Programs under ASEAN-SEAFDEC Fisheries Consultative Group (FCG) Mechanism
    - 3.2.1 Secretariat
    - 3.2.2 Training Department
    - 3.2.3 Marine Fisheries Research Department
    - 3.2.4 Aquaculture Department
    - 3.2.5 Marine Fishery Resources Development and Management Department
  - 3.3 Other Programs
- Agenda 4** Pipeline Projects and Emerging Needs for Preparation of Future Project Proposals
- Agenda 5** Other Matters
- 5.1 Establishment of Regional Scientific Advisory Committee for Fisheries Management in Southeast Asia (RSAC)
  - 5.2 Others
- Agenda 6** Cooperation with Donors, Non-Member Government and International/Regional Organizations
- Agenda 7** Recommendations of the Thirtieth Meeting of the Program Committee
- 7.1 Adoption of Report of the Meeting
  - 7.2 Date and Venue of the Thirtieth Meeting of the Program Committee
- Agenda 8** Closing of the Meeting

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<sup>1</sup> Marine Fisheries Research Department (MFRD) and Marine Fishery Resources Development and Management Department (MFRDMD) have no Departmental Programs for the year 2006 and 2007.

## Annex 4

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES  
FOR THE YEAR 2007-2008**

**INTRODUCTION**

SEAFDEC programs for the year 2007-2008 are listed below, and proposed activities which detailed of their projects as attached as *Appendix 1* and *Appendix 2*.

<b>Programs</b>	<b>Responsible Departments</b>
<b>Programs Implemented in the year 2007</b>	
1. Center-wide Information Network	Secretariat
2. Information and Communications Technology	TD
3. Mollusc	AQD
4. Mud Crab and Shrimp	AQD
5. Marine Fish Program	AQD
6. Small-Holder Freshwater Aquaculture	AQD
7. Seaweed	AQD
8. Aquatic Ecology	AQD
9. Other Research and Development Activities	AQD
<b>Proposed Programs Implemented in the Year 2008</b>	
1. Center-wide Information Network	Secretariat
2. Information and Communications Technology	TD
3. Tailor Made Training and Study Tour	TD
4. Integrated Mollusc Production	AQD
5. Mud Crab and Shrimp	AQD
6. Marine Fish	AQD
7. Small-Holder Freshwater Aquaculture	AQD
8. Seaweed Strain Improvement	AQD
9. Aquatic Ecology	AQD
10. Other Research and Development Activities	AQD



## **OVERALL REVIEW OF THE DEPARTMENTAL PROGRAM IMPLEMENTATION IN THE YEAR 2007**

### **1. Center-wide Information Network**

The program aims at keeping the Member Countries, other organizations and public well informed of SEAFDEC activities; raising public awareness and visibility of SEAFDEC; and providing various forms of fisheries information to support decision-making, management and development of fisheries sector. In order to achieve the objectives, the program aims to produce materials to promote activities and visibility of the Center, enhances communication among the SEAFDEC staffs and communication with the Member Countries and other organizations, as well as providing HRD opportunities for the relevant SEAFDEC staff in order to improve the activities.

The activities include production of organizational promotional publications, SEAFDEC Annual Report, reports of SEAFDEC annual meetings, Special Publication “Fish for the People”, as well as the Fishery Statistical Bulletin. The SEAFDEC Integrated Website was maintained and links to the departmental websites were provided. In addition to SEAFDEC Website, the Secretariat also initiated the Small-Scale Fisheries Global Website, upon the recommendations from the first Regional Fishery Bodies Secretariat Network (RSNs) held at FAO in March 2007. To monitor the implementation of information-related activities, and provide platform for SEAFDEC Secretariat and Departments to formulate activities for the following year, the Information Staff Exchange Program (ISEP) Meeting was regularly organized. The Meeting also aimed to monitor achievement and progress in the implementation of the Information Strategies for Enhancing SEAFDEC Visibility and Communication, to be further reported to the forthcoming SEAFDEC Council Meeting for consideration and endorsement.

As part of the Center-wide Information Network framework, the Regional Fisheries Policy Network (RFPN) was included. Currently, the RFPN comprises representatives from Cambodia, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam to station at the SEAFDEC Secretariat; and virtual members from Japan, Myanmar and Singapore. Under the program framework, the RFPN’s role will emphasize on coordination with Member Countries in enhancing SEAFDEC Visibility and implementation of activities.

### **2. Information and Communications Technology**

Concerning public relations and the promotion of SEAFDEC visibility, TD has joined in national exhibitions and presented SEAFDEC roles in Sustainable Fisheries Development in the ASEAN Region. In celebration of the 40<sup>th</sup> SEAFDEC anniversary, TD is planning to organize an “open house” project for public relations of TD activities. Moreover, TD plastic bags and cotton bags were produced as promotional materials to raise awareness about global warming crisis and distributed via exhibitions, training courses, seminars and workshops.

Nine VCDs are produced and five are in the process of production to support relevant TD projects and activities and to meet requirement from SEAFDEC member countries. Four research paper series, one special publication and six reports of activities implemented by TD were printed and distributed to target groups in SEAFDEC member and non-member countries.

Furthermore, TD emphasizes the promotion of TD activities via TD homepage (<http://td.seafdec.org>). It is frequently updated to disseminate TD news timely. In 2007, more

web travelers in the world show an interest in TD website. Since January until September 2007, 4,283 web travelers had visited TD website and 647 web travelers downloaded TD databases.

### 3. Mollusc

The program has continued to focus on: (i) refining the seed production techniques for donkey ear abalone, *Haliotis asinina*, (ii) pilot testing the propagation and use of diatoms for larval settlement of the donkey ear abalone, (iii) comparing the economic viability of producing advanced abalone juveniles in tanks and sea cages set in open waters and (iv) developing viable technology packages for the intermediate nursery culture and marketable abalone production.

Experiments were done to improve the techniques for broodstock maturation, larvae management and transport protocols for larvae and juveniles. Results on broodstock maturation in indoor and outdoor holding tanks were similar in terms of gonadal maturation and rematuration frequency, and spontaneous spawning. In larval management, stocking of larvae immediately after collection or 6 hour later gave better survival at day-10. Delaying the stocking or holding the larvae for 12-24 hour after retrieval resulted in higher mortalities (range was 20-40%).

For simulated larval transport experiments, trochophore larvae loaded at 50,000/liter and transported within 6 hours in oxygenated plastic bags at 20-22°C had better survival than those loaded at 25 or 100 larvae/liter or when transported at higher temperature (24-25°C). Higher survival was obtained in bigger juveniles and transported at temperature of 24-25 after simulated transport within 30 hours than in small juveniles and transported at 18-21°C.

The effects of light intensity and photoperiodicity on the settlement rate, feeding behavior, growth and survival of abalone post-larvae were assessed. No ingestion was observed on day 1 to day 4 larvae under standard hatchery rearing conditions. The presence of food in the gut was observed from day 5 until day 15.

Two experimental runs were conducted one-liter plastic container to assess the settlement of larvae. Both runs resulted in high mortality and very low larval settlement. To assess the cause, four treatments were tested: no aeration, with aeration, no aeration + flow through on the 3<sup>rd</sup> day, and with aeration + flow through on the 3<sup>rd</sup> day. Percent settlement of larvae after 3-5 days of rearing was similar in treatments without aeration and with aeration plus flow through on the 3<sup>rd</sup> day. Percentage settlement of larvae at different locations (light intensity) and reared in 1 liter plastic container was not distinct.

The lipid and essential fatty acid requirements of juvenile abalone were evaluated. Analysis of proximate composition of abalone meat showed 67% protein, 3% crude fat, 16% nitrogen-free extract, and 11.4 crude ash. .

Studies to verify the hatchery techniques for the donkey's ear abalone were continued. During the third quarter, more than 25 million veligers (61.3% survival) were produced from 48.87 million trochophore eggs. Early juvenile production during the period was 46,418 individuals.

A modular system of rearing abalone juveniles in mesh sea cages was evaluated in two runs. Both batches exhibited high growth and survival rates and good food conversion ratio after 5 months culture period .

A Pilot-testing of abalone hatchery technology in collaboration with a private sector was conducted from August 2006 to August 2007. The cooperators availed a total of 10 million veliger larvae which produced around 116,557 early and advanced juveniles (range of survival: 0 - 6.4%).

*Training.* An International Training course on Abalone Hatchery and Seed Production was conducted in September 2007. Eighteen participants from Malaysia, Myanmar, Indonesia and Philippines from both the government and the private sector, completed the course. On-the-Job and Internship training programs on Abalone hatchery and nursery were also conducted.

#### 4. Mud Crab and Shrimp

**Mud Crab:** Activities have focused on domestication, refinement of broodstock management and seed production techniques, and improving the culture techniques during nursery and grow-out phases and in different production systems.

*Scylla serrata* stocks from Cagayan, Camarines Norte, Northern Samar and Surigao were assessed for their genetic diversity and screened for presence of viral diseases. Stocks from all sites were negative for viruses, except for 2 crabs from Cagayan found to be positive for IHNV.

The reproductive performance of broodstock maintained in outdoor and indoor maturation tanks with sand substrate was compared. The number of females whose eggs hatched was 60% for outdoor maturation tanks and 40% for indoor maturation tanks.

Two experimental runs were conducted to compare the commercial and SEAFDEC-developed probiotic and with antibiotic (control) in crab larviculture. Survival from zoea to megalopa was 3.8% in probiotic with antibiotic.

Various shrimp larval formulated diets available commercially and SEAFDEC formulated diets were tested for crab larviculture. After 30 days, highest survival was noted at 6 g/ton/day feeding. This level of formulated diet was used in the succeeding run in comparison with natural food (fish and mussel) alone or in combination. Highest survival was obtained in crabs fed mussel + formulated diet and lowest, in crabs fed trash fish + formulated diet.

The production of mud crab juveniles in different nursery systems was evaluated. Highest production was found in megalopae stocked in cages provided with ribbon-like zigzag net substrates hung in water column compared to those stocked in cages with net substrates positioned on the bottom.

The use of formulated diet in grow-out rearing of *S. serrata* juveniles in brackishwater ponds was tested. After 3 months, specific growth rate of crabs fed fish alone was higher than those fed fish and formulated diet.

Grow-out production in pond and mangrove pens in Dumangas Brackishwater Substation was compared. *S. serrata* juveniles stocked in pond grew better than those in mangrove pen.

As part of the initiative to disseminate and facilitate adoption of AQD technologies on mud crab, the following have been identified for implementation in Northern Samar: (i) Capacity building, (ii) Refinement of mud crab culture practices, (iii) Stock assessment and policy, (iv) monitoring and evaluation, and (v) marketing.

**Shrimp:** The program on shrimp focuses on: (i) developing the technology to produce viable *P. monodon* and *P. indicus/P. merguensis* broodstock in captivity and determining the economic viability of such activity; (ii) maintaining the family lines of the 3 species; (iii) refining the techniques for broodstock management of *P. monodon* and *P. indicus/P. merguensis*; and (iv) refining the techniques and evaluating the commercial viability of *P. indicus* and *P. merguensis* hatchery and grow-out culture.

To help monitor the incidence of diseases of crustaceans, GIS mapping of target diseases has been a regular activity. A draft webpage has also been constructed for fish and crustacean diseases.



As part of the initiative to develop a specific pathogen-free shrimp (*P. monodon* and *P. vannamei*) broodstock, the status of *P. monodon* captive broodstock development in Southeast Asian region and the possible impact of the introduction of *P. vannamei* in the region have been monitored.

*P. monodon* breeding program: Multiplication centers were established in Thailand, Vietnam and India for SPF *P. monodon* fry produced in Hawaii. Indonesia has not gone into breeding program. In Malaysia, the performance of SPF *P. monodon* improved 50-80% in grow-out pond. In the Philippines, maturation in captivity was achieved even without ablation but spawning was attained only after ablation. Two batches of F<sub>1</sub> have been produced.

*P. vannamei* and other exotic shrimps: Various countries in Southeast Asia have already gone into the breeding and culture of white shrimp as an alternative to *P. monodon*. In Indonesia, fry were produced from stocks imported legally, grown in ponds and from these broodstocks were selected for use of private hatcheries. In Thailand, legal importation of *P. vannamei* has been allowed since mid 2002 on the condition that stocks are free of viruses. In Brunei Darussalam, after the successful verification trials on *P. stylirostris*, farmers had started growing this species in their ponds in 2000. In Singapore, biosecure facility has been established, postlarvae are grown to broodstock size and sold to operators in Malaysia, Indonesia and Myanmar. Vietnam has also joined the league of white shrimp producers.

In the Philippines, postlarvae of specific pathogen-free *P. vannamei* broodstocks have been distributed to accredited shrimp farmers. Since lifting of the ban that prohibits the entry of exotic shrimps and prawns in the country, there has been an increased demand of postlarvae and this has led to selection of market size stocks from ponds by private sectors and use of these broodstock in local hatcheries. This poses a risk of possible spread of exotic diseases if proper screening is not done.

Characterization of *P. monodon* broodstock. Pleopod samples from *P. monodon* collected from Bohol, Roxas and Bacolod in November 2006 are being processed. Restriction morphs obtained from RFLP analysis using *RsaI* and *HaeIII* showed monomorphic patterns in all the three stocks.

Studies on improvement of maturation of pond-reared *P. monodon* broodstock. A total of 2 batches of F<sub>1</sub> have been produced, but the fecundity and hatching rate were low. Separation of males and females was done for the first batch to observe its effect on percent mating. Males and females previously separated then mixed had 50-60 % mating and those that were mixed from the start of culture had 67-100%.

Refinement of broodstock management and larval rearing of *P. indicus/merguiensis* . Two runs were conducted to compare the effects of SEAFDEC-developed probiotics with antibiotics and other commercial water treatments in prawn larval rearing. The first run showed that survival until day 15 of postlarvae was similar for all treatments; however, survival rates were low. In the second run, 2 more treatments were included (commercial probiotic and a probiotic from France). Luminescent bacteria were found in all stocks except in those treated with the SEAFDEC-developed probiotic.

Verification of *Penaeus indicus* grow-out diets in ponds using environment-friendly scheme. Due to lack of enough white shrimp *P. indicus* postlarvae, *P. vannamei* postlarvae were stocked in ponds and fed with SEAFDEC shrimp diet (29% crude protein) and commercial *P. vannamei* feed (52% crude protein). Biosecurity measures and the use of biomanipulators (i.e. milkfish, tilapia and siganids) were employed.

## 5. Marine Fish

The Program aims to refine broodstock management, seed production, and grow-out technologies for marine fishes and promote marine fish hatcheries for livelihood in coastal areas. The following studies were continued in 2007: (i) breeding and seed production of 5 species of marine fish namely milkfish, rabbitfish, grouper, snapper and seabass, as well as of seahorses; (ii) the potential use of insulin-like growth factor II (IGF-II) mRNA expression as molecular marker for egg quality in fish; (iii) verification studies on the use of SEAFDEC AQD formulated grow-out diets for milkfish cultured in marine cages, and for grouper, snapper and sea bass cultured in ponds; (iv) verification study on the use of a low grade metaldehyde to control snail population in milkfish grow-out culture ponds; and (v) production runs for milkfish fingerlings production in ponds, grow-out culture for milkfish, rabbitfish and grouper in brackishwater ponds, and grouper culture in floating net cages. The studies on fish seed production focused on the use of SEAFDEC AQD-formulated larval diets for milkfish, rabbitfish, grouper, red snapper and sea bass. .

A study was initiated to develop the strategies that will extend the spawning season of the Asian sea bass (*L. calcarifer*) in captivity. With regard to studies using SEAFDEC AQD-formulated feed for rearing of milkfish and rabbit fish, it was found that newly installed recirculating system has improved the water quality and consequently increased the spawning frequency in milkfish.

A study aimed to evaluate if IGF-II gene could be used as a molecular marker to determine the quality in fish eggs and larvae of grouper, milkfish and rabbitfish was continued.

The study to understand the reproductive biology of pompano, *Trachinotus blochii* was initiated. Maturing gametes have been detected in adult fish but no spontaneous spawning has been observed. .

The use of PUFA-rich thraustochytrids as enrichment diets for live foods (rotifers and Artemia) in the larviculture of sea bass, *L. calcarifer* was evaluated. Fatty acid analysis of *Schyzochytrium* strain of thraustochytrids from Leyte showed high levels of PUFA. Proximate analysis of mysid shrimps showed high crude protein, EPA and DHA levels.

Experiment was also initiated to improve the nutritional value of locally available feed resources for practical aquatic feeds. *Bacillus* sp and *Lactobacillus* sp are among the non-pathogenic microorganisms present in milkfish anterior and mid intestine and these can be used in fermentation of feed ingredients.

The influence of environmental stress on innate immunity and resistance to bacteria in grouper fed various immunostimulants was evaluated. Results showed that immunostimulants protect stressed fish from *Vibrio* infection. Analysis of in vitro immune parameters is ongoing.

The seed production technique of high value marine fish species was verified. New larval feed formulation for marine fish was easily accepted by larvae starting at day 15. Grouper can be weaned to artificial diet at day 45 and sea bass at day 21.

Studies to improve the cage nursery rearing techniques for sea bass (*Lates calcarifer*), grouper (*Epinephelus* spp) and mangrove red snapper (*L. argentimaculatus*) were undertaken. Zooplankton was cultured in ponds for food of fry (grouper/ sea bass); dominant genera observed were *Acartia*, *Calanus*, *Oithona*, and *Pseudodiaptomus*.

Two trials involving production of milkfish fingerlings showed high survival (greater than 90%) and low incidence of abnormalities of fry from batch obtained in early season spawning. Fry from off-season spawning had low survival and high incidence of abnormality.

The experiment aimed to assess the effect of metaldehyde to control snail population in milkfish grow-out culture pond showed that molluscicide metaldehyde (75% META) was effective in treating moderate and heavy snail infestation in milkfish ponds. However, if cost is to be considered the nicotinamine sulfate, or ammonium sulfate/lime was found a good alternative.

Experiments were conducted to verify the use of AQD formulated diet for grow-out culture of grouper, snapper and seabass in ponds. Growth and survival of fish fed SEAFDEC diet compared well or were even better than those of fish fed commercial grouper/snapper diet. In grouper, growth and survival of sea bass on SEAFDEC diet compared well with those fed commercial diet. Lower survival rates of grouper and sea bass were due to cannibalism.

In a study which evaluated the production of sea bass, grouper and mangrove red snapper in brackishwater ponds, it was found that these species grew better when fed zooplankton than the trash fish. Grouper survival was low (3-8%) due to cannibalism.

The use of SEAFDEC formulated diet for grow-out of marine fishes (sea bass and grouper) in production ponds and for milkfish in marine cages was tested and compared with commercial milkfish feed. Grouper grown in floating sea cages using SEAFDEC diet for 120-day culture period was also evaluated. After 120 days, the fish attained 260g average body weight, specific growth rate of 1.1 and food conversion ratio of 2.3.

The use of white cowpea as an alternative source of protein for grouper, *E. coioides* was evaluated. Initial finding showed that it is a promising alternative plant protein source.

A study was initiated on the reproductive biology of pompano, *Trachinotus blochi*. Maturing gametes were detected in adult fish but no spontaneous spawning was observed.

## **6. Small-holder Freshwater Aquaculture**

The main objective of the Program is to improve the seed production and grow-out technologies for tilapia, catfishes, carps, and freshwater prawn and promote freshwater aquaculture for livelihood. Activities have focused on: (i) refining the seed production methods of selected freshwater commodities (e.g. giant freshwater prawn, catfish, carp, tilapia and milkfish); (ii) developing grow-out production of giant freshwater prawn in lakes using cages; (iii) improving the production of both the hatchery and grow-out of the aforementioned freshwater commodities; (iv) assessing the social and economic impact of aquaculture in Laguna de Bay region; (v) verifying and commercializing the freshwater aquaculture technologies; and (vi) disseminating the verified freshwater aquaculture technologies through publications and conduct of seminars, workshops and hands on-training.

To help address the dwindling stocks of the Asian catfish (*Clarias macrocephalus*) in the Philippines, efforts are being made to develop protocol for induced breeding and nursery techniques. In line with this, growth and survival of fry in net cages with and without supplemental feeding in Laguna de Bay was evaluated. After 6 weeks rearing in hapa net cages, growth of fry was higher among those that received artificial diet compared to those fed exclusively on natural food available in the lakes. Specific growth rate and weight gain were highest in the fry offered ration of 25%/day of the fish biomass. Survival rate was highest in those fry given 15%/day feed ration.

Verification studies on hatchery seed production technology for the native catfish, *C. macrocephalus* were conducted. The last spawning trial produced more than 45,000 fry (day-4). Two collaborations on nursery in hapa cages installed in ponds are on-going; one each in Guimbal and Dumangas in Iloilo and in Tibiao, Antique. Fish are being fed SEAFDEC-formulated feeds.

A study is being conducted to develop *M. rosenbergii* seedstock tolerant to low salinity and/or freshwater and to reduce the cost of giant freshwater prawn seedstock production. Several female breeders were spawned and batches of larvae were reared separately in 12 ppt and 6 ppt salinity levels. Larvae previously hatched and nursed in reduced salinity (6ppt) showed better growth and survival, indicating that reducing the hatchery/nursery salinity does not negatively affect the performance traits in the freshwater prawn. A 5-month growth experiment in tanks and cages is on-going to determine the growth and survival of the selected and control prawns. Heritability values after the first round of selection shall be determined at the end of the 5-month rearing period.

Experiments are in-progress to determine the effect of horizontally oriented shelters on growth and survival of *Macrobrachium rosenbergii* in modular cages in Laguna de Bay. Better growth and survival, daily growth rate, and specific growth rate were observed in cages provided with net shelters but the differences were not statistically significant.

The reproductive performance and fry production of bighead carp *Aristichthys nobilis* net cages installed in Laguna de Bay and using different feeding regimes have been assessed. Female and male bighead carp broodstock fed for 2 months before spawning had highest average gonadal maturity while those female carp broodstock fed for only 1 month had lowest gonadal maturity. Among those induced to spawn females fed for 1 month had significantly higher fertilization rate and hatching rate. Growth performance evaluation of fry obtained from the different treatments is in progress.

Survey to assess the economic impacts of aquaculture development in Laguna Lake over time was conducted and data are being analyzed. Interview with the key informants to gather information on issues affecting the Laguna Lake and aquaculture respectively is also on-going.

The Aquaculture and Water Quality component of the project 'Integrated Fisheries Resource Management' in Rinconada Lakes, Philippines and New South Wales, Australia was initiated. Nile tilapia stocking density experiments with fish farmer cooperators in Lake Bato resulted in tilapias with average body weight of 180 to 200 grams after 4 months for those fish given artificial feed, regardless of stocking density. Those not given any formulated feed had average body weight of 100 g.

Commercially important Philippine stocks of freshwater prawn, *Macrobrachium rosenbergii* were genetically characterized using DNA markers. Preliminary results showed distinct genetic differences between hatchery and wild stocks based on restriction morphs obtained after digestion with restriction enzymes. Parameters estimating genetic variation can only be computed after all the samples have been analysed. Work on mtDNA sequencing using representative samples from different stocks (hatchery stock from Thailand, wild stocks from Leganes, Iloilo, Pampanga, Zambales and Liguasan Marsh. The wild stocks from Leganes and Pampanga are taxonomically *M. rosenbergii* while the Zambales stock's identity has yet to be confirmed as either *M. rosenbergii dacqueti* or an interspecific hybrid. Work on mtDNA sequencing using representative samples from each stock will be continued with the sequencing of samples from Mindanao.

Morphometric characterization and performance evaluation in terms of reproductive efficiency of *M. rosenbergii* stocks and closely related species found in the Philippines were continued. Prawn samples from several sites in Luzon and Mindanao were obtained and identities of some of the samples were determined and validated. To date, 14 *Macrobrachium* species found in almost all Philippine regions have been identified. Scientific manuscript and field identification guide based on the data generated from this study are being prepared.

With regard to experiment aimed to evaluate the reproductive performance of *M. rosenbergii* stocks, differences in the reproductive efficiency of hatchery and wild stocks were found. BFAR stocks fed low protein fish feed *ad libitum* had the highest number of hatchlings while Calumpit stocks fed low protein fish feed at 2% prawn biomass had the most number of hatchlings per gram female body weight..

The performance of different strains of *M. rosenbergii* during grow-out in lake-based cages using 2 mesh types (hapa vs. B-net), with or without shelter, and various types of feed (shrimp feed, tilapia feed and catfish feed) was assessed. After 6 months culture, the growth and survival rates were higher among those reared in hapas than those in B-net cages. The effects on growth and survival with regard to feed type and presence or absence of shelter were not significant.

The bioeconomics of hatchery production of freshwater prawn (*Macrobrachium rosenbergii*) using two culture systems (either green water and clear water) were assessed. Those reared in green water took only 28 days to reach post larval stage and had higher survival rate (34.1%). Survival was lower among those reared in clear water and took longer days (33 days) to reach post larval stage.

An experiment aimed at improving the carcass traits in Nile tilapia (*Oreochromis spp*) through farm-based mass selection and interspecific hybridization was continued. The second generation broodstock selected for improved fillet yield have spawned and F<sub>3</sub> fingerlings are now being reared and monitored for growth. Results will form the basis for deciding whether selection for increased fillet yield is a heritable trait.

## **7. Seaweed**

The Program focuses on production of ‘new’ and improved varieties of *Kappaphycus* through tissue culture, sporulation, and protoplast fusion techniques.

The following activities were undertaken in 2007: (i) development of young plantlets of three varieties of *Kappaphycus* from tissue culture using new culture media at different concentrations; (ii) development of new shoots from *in situ* callus were developed from three varieties of *Kappaphycus*, and (iii) grow-out culture of *Kappaphycus* from spores in tanks.

## **8. Aquatic Ecology**

The program focuses on (a) Institutional arrangement in local governance in selected municipalities in Western Visayas, Philippines, (b) Determination of environmental capacity of Igang Bay and other aquaculture sites, and (c) ecological studies for sustainable aquaculture. Technologies developed from other SEAFDEC/AQD programs will be adapted in the studies under this program. Results of nutrition studies from marine fish and crustacean programs will be considered in estimating the environmental capacity of the sites.

During 2007, two studies were initiated: (i) Environmental capacity of Humaron Cove, Igang, Guimaras and Bugang River, Pandan, Antique; and (ii) The tangab fishery in Iloilo Strait: Operations, catch volume and species composition, economic importance and ecological impact.

With regard to the first study, the sites selected were Humaron Cove, Igang, Guimaras and Bugang River, Pandan, Antique. Analysis of water quality suggest that the environmental capacity of the sites may not have been reached yet. The other study gathered qualitative and

quantitative information to enable appropriate regulation of the tangab fishery<sup>1</sup>. Survey showed that tangab operations were concentrated and the catch landed at four sites in Iloilo Strait. About 200 species of fishes, crustaceans, mollusks and other invertebrates have been identified in the tangab catch in 4 sites.

## 9. Other R&D Activities

### *Institutional Capacity Development on Sustainable Aquaculture*

This collaborative program aims to institutionalize the practice of sustainable and responsible aquaculture through capacity building of local government units and community-based organizations in the Philippines. The collaborating partners are the SEAFDEC team which comprises the scientists/researchers, technologists, trainers and information specialists; the NGO-partners who undertake the social preparation through community organizing, values formation, enterprise development, and other activities; and the local government units (LGUs) and donors (ACIAR, Petron) who provide the financial and logistical support. The basic strategies used in the Program are: community-based approach, co-management approach and networking and partnerships.

In 2007, the following activities were done in Antique, Capiz and Samar Provinces:

#### Antique

- Hands-on training on seabass cage culture in ponds (Hamtik)
- Mud crab pond culture (Pandan), in collaboration with Polytechnique State College of Antique –Tibiao
- Consultation with different stakeholders on the problems related to aquaculture and coastal resources; and with fisherfolk community of Anini-y on sea-ranching of abalone
- Farm demonstration on seabass cage culture in ponds (Hamtik), floating cages (Pandan), and freshwater hatchery systems (PSCA)
- Research on socioeconomics of fisherfolk in Anini-y and searching of abalone in Anini-y

#### Capiz

- Season long training on mudcrab and grouper culture in brackishwater ponds.
- Consultation with rural community in Dumarao on freshwater aquaculture livelihood and seeding of carp
- Season-long training course on freshwater aquaculture in Dumarao
- Farm demonstration of brackishwater pond culture of mudcrab and grouper (Capiz State University) and cage culture of freshwater species in Dumarao river.
- Research on breeding of angel wings (*diwal*) for stock resources management in the near future.

#### Northern Samar

- Season-long training course on mudcrab nursery and grow-out for fisherfolk from various municipalities)
- Training for NGO-partners on stock assessment of mudcrab seed stock in the wild
- Farm demonstration on mudcrab pond nursery and grow-out and farm-based feed formulation for mudcrab fattening
- Research on stock assessment of mudcrab seed stock and market study of mudcrab in Northern Samar
- Social preparation activities by NGO-partner

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<sup>1</sup> A tangab is a large fixed filter net many of which are set and operated along Iloilo Strait.

### ***ABOT AquaNegosyo***

The initiative on 'Agree-Build-Operate-Transfer' (ABOT) AquaNegosyo showcases the complete packages on viable aquaculture technologies (hatchery, nursery and grow-out culture of various economically important aquatic species) developed by AQD for private sector investors and aquaculture farmers in the Philippines. Since its inception in September 2006, discussions and visit to farms have been made with several clients. Formal agreement has been signed with one client. Three other site assessment tasks have been completed in Zambales, Pangasinan, and Tarlac.

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES  
FOR THE YEAR 2007-2008:**

**SECRETARIAT**

In 2007, SEAFDEC Secretariat implemented one departmental program namely the Center-wide Information Network. The program aims at keeping the Member Countries, other organizations and public well informed of SEAFDEC activities; raising public awareness and visibility of SEAFDEC; and providing various forms of fisheries information to support decision-making, management and development of fisheries sector. In order to achieve the objectives, the programs aims to produce materials to promote activities and visibility of the Center, enhance communication among the SEAFDEC staffs and communication with the Member Countries and other organizations, as well as providing HRD opportunities for the relevant SEAFDEC staff in order to improve the activities.

The activities include production of organizational promotional publications, SEAFDEC Annual Report, reports of SEAFDEC annual meetings, Special Publication “Fish for the People”, as well as the Fishery Statistical Bulletin. The SEAFDEC Integrated Website was maintained and links to the departmental websites were provided. In addition to SEAFDEC Website, the Secretariat also initiated the Small-Scale Fisheries Global Website, upon the recommendations from the first Regional Fishery Bodies Secretariat Network (RSNs) held at FAO in March 2007. To monitor the implementation of information-related activities, and provide platform for SEAFDEC Secretariat and Departments to formulate activities for the following year, the Information Staff Exchange Program (ISEP) Meeting was regularly organized. The Meeting also aimed to monitor achievement and progress in the implementation of the Information Strategies for Enhancing SEAFDEC Visibility and Communication, to be further reported to the forthcoming SEAFDEC Council Meeting for consideration and endorsement.

As part of the Center-wide Information Network framework, the Regional Fisheries Policy Network (RFPN) was included. Currently, the RFPN comprises representatives from Cambodia, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam to station at the SEAFDEC Secretariat; and virtual members from Japan, Myanmar and Singapore. Under the program framework, the RFPN’s role will emphasize on coordination with Member Countries in enhancing SEAFDEC Visibility and implementation of activities.



## PROGRAM DOCUMENT

**Program Category:** Departmental Program

**Program Title:** Center-wide Information Network

**Responsible Department:** SEAFDEC Secretariat

**Total Duration:** Since 1998

### 1. INTRODUCTION

Considering vital role of information as a tool in the development and management of fisheries sector, a 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. In addition, during the 38<sup>th</sup> Meeting of SEAFDEC Council, the 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. Framework and activities under the program has been adjusted to be in-line with the Information Strategy.

### 2. PROGRAM

The program on Center-wide Information Network aims at keeping the Member Countries, other organizations and public well informed of SEAFDEC activities; raising public awareness and visibility of SEAFDEC; and providing various forms of fisheries information to support decision-making, management and development of fisheries sector. In order to achieve the objectives, the programs aim to produce materials to promote activities and visibility of the Center, enhance communication among the SEAFDEC staffs and communication with the Member Countries and other organizations, as well as providing HRD opportunities for the relevant SEAFDEC staffs in order to improve the activities.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

Information-related activities undertaken by the Secretariat in collaboration with all SEAFDEC Departments during the year 2007 under the Center-wide Information Network framework are as follow:

Project/Activity Title	Duration	Remarks
<b>Production and dissemination of reports of SEAFDEC annual meetings</b> <ul style="list-style-type: none"> <li>• Report of the 29<sup>th</sup> SEAFDEC Program Committee Meeting</li> <li>• Report of the 9<sup>th</sup> ASEAN-SEAFDEC FCG Meeting</li> <li>• Report of the 39<sup>th</sup> SEAFDEC Council Meeting</li> </ul>	Feb 2007 Feb 2007 Sep 2007	100% 100% 100%
<b>Production and dissemination of Annual Report 2006</b> SEAFDEC Annual Report publishes highlighted activities and achievement of SEAFDEC, as well as summary of progress of SEAFDEC programs, activities undertaken in a year. Number of production is 1,000 copies, distributed to Member Countries, Network Libraries, fisheries-related institutions/organizations, collaboration organizations, and interested people.	Aug 2007	100%

<p><b>Production and dissemination of Newsletter Volume 30 Number 1-4</b>  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 1,800 copies, distributed to Member Countries, Network Libraries, fisheries-related institutions/organizations, collaboration organizations, and interested people. The target distribution has been updated in 2007, and Newsletter is also available through SEAFDEC Integrated Website.  In addition to the English version, approx 200 copies of Japanese version Newsletter were also produced for distribution in Japan.</p>	<p>Q1, Q2, Q3, Q4</p>	<p>75%</p>
<p><b>Production and dissemination of Special Publication “Fish for the people” Volume 5, Number 1-3</b>  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. Number of production is 1,300 copies per issue. The Special Publication may also extend to donors and technical institutions that can be potential collaborators for the promotion of sustainable fisheries in ASEAN region. The target distribution has been updated in 2007, and the Special Publication is available through SEAFDEC Integrated Website.</p>	<p>Q2, Q3, Q4</p>	<p>100%</p>
<p><b>Fishery Statistical Bulletin for the South China Sea Area</b></p> <ul style="list-style-type: none"> <li>• Production of Statistical Bulletin for 2004</li> <li>• Development of New Framework for the Fishery Statistical Bulletin for Southeast Asia (for Bulletin 2005 and onwards)</li> </ul>	<p>Q4 Q4</p>	<p>80%</p>
<p><b>Maintaining and improving of the SEAFDEC Integrated Website</b>  SEAFDEC Integrated Website was restructured based on recommendation at the 6<sup>th</sup> Information Staff Exchange Program Meeting. In the future, the Homepage will contain information on progress of SEAFDEC programs, updated news, regional fisheries issues, SEAFDEC publications, event calendar, and press release from SEAFDEC meetings. Information e.g. brochures, exhibition posters, meeting reports, etc. is also available for download.   In addition to SEAFDEC Website, the Secretariat also initiated the Small-Scale Fisheries Global Website upon the recommendations from the first Regional Fishery Bodies Secretariat Network (RSNs).</p>	<p>Q1-Q4 2007</p>	<p>100% On-going</p>
<p><b>Other promotional activities</b></p> <ul style="list-style-type: none"> <li>• Exhibition at the COP14-CITES (The Netherlands)</li> <li>• Exhibition to commemorate 120 Year Thai-Japan Relationship (Thailand)</li> <li>• Exhibition at the 29<sup>th</sup> AMAF Meeting (Thailand)</li> </ul>	<p>3-15 June 2-5 July 29 Oct-2 Nov</p>	<p>100% 100% 100%</p>

<ul style="list-style-type: none"> <li>• SEAFDEC Brochure (40<sup>th</sup> Anniversary Edition) – 2,000 copies</li> <li>• SEAFDEC Information Catalogue 2007 – 1,000 copies</li> <li>• Brochure on SEAFDEC in Promotion of Responsible Fisheries, and CD-Rom compiling Regional Guidelines on Responsible Fisheries in Southeast Asia – 2,000 copies</li> </ul>	<p>October October November</p>	<p>100% 100% 100%</p>
<p><b>Eighth SEAFDEC Information Staff Exchange Program Meeting</b> ISEP is organized annually on a rotation basis (hosted by Secretariat and each SEAFDEC Department) Main objectives of the 8<sup>th</sup> ISEP Meeting are 1) to review and monitor progress of implementation of SEAFDEC information activities and Information Strategy for Enhancing Visibility and Communication; 2) To introduce and exchange view on initiatives in information aspects undertaken by MFRDMD (as host department) among information officers as part of developing SEAFDEC human resources in production and promotion of the information; and 3) To discuss activities to be incorporated under the Center-wide Information Network Program framework for the following year.</p>	<p>13-15 November</p>	<p>100%</p>
<p><b>Regional Fisheries Policy Network (RFPN)</b> The Regional fisheries Policy Network comprises members from Cambodia, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam to station at the SEAFDEC Secretariat; and virtual members from Japan, Myanmar and Singapore have also been designated by their respective countries.</p> <p>The main roles or the RFPN are to identify fisheries-related issues related which may have potential impacts on fisheries in the region, initiate studies and activities, and promote the formulation of regional fisheries policies and recommendations on the issues. The RFPN also assist in coordination with Member Countries to obtain views and information as basis for such activities, and to promote closer collaboration between SEAFDEC and Member Countries.</p> <ul style="list-style-type: none"> <li>• Involve in establishment of RSN-SSF Website and development of Small-scale Fisheries Profile of each ASEAN Member Country for the website</li> <li>• In-House Training on Writing Fisheries Policy Briefs</li> </ul>	<p>Jan-Dec</p>	<p>On-going</p>

#### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

The Information activities proposed to be undertaken in the year 2008 are:

	<b>Remarks</b>
1. Production of SEAFDEC Annual Report 2007	1,000 copies
2. Information Compilation 2007 CD Rom 2007	50 copies
3. Production of SEAFDEC Newsletter Vol. 31 No. 1-4	1,700 copies
4. Production of the reports of SEAFDEC Annual Meetings (PCM, FCG, Council)	150 copies each
5. Production of Special Publication: "Fish for the People" Vol. 6 No. 1-3	1,300 copies

6. Production of 10-Year Trust Fund Publication	1,000 copies
7. Maintaining and updating SEAFDEC Integrated Homepage	
8. Development of Global Small-scale Fisheries Website	
9. Production of SEAFDEC Calendar 2009 (TD)	4,000 copies
10. Compilation and Production of Stat Bulletin 2005, 2006	400 copies each
11. Ninth SEAFDEC Information Staff Exchange Program (ISEP) Meeting	
12. Production of other promotional materials e.g. brochures, posters, etc.	
13. Regional Fisheries Policy Network (RFPN)	

In addition, based on the discussion and recommendation at the 8<sup>th</sup> Meeting of the SEAFDEC Information Staff Exchange Program, the following activities would also be explored and may be accommodated under the Program on Center-wide Information Network, based on availability of budget:

1. Exchange program among departmental information staff
2. Organization of workshop to enhance capacity of information officers, and editors in providing inputs to the Special Publication "Fish for the People"
3. Development of tool for e-distribution of SEAFDEC information
4. Promotion of SEAFDEC Documentary Video through television or cable TV

#### Tentative Timeframe

Activity	J	F	M	A	M	J	J	A	S	O	N	D
1. Annual Report 2007												
2. Information Compilation CD Rom												
3. Newsletter (4 issues)												
4. 30 <sup>th</sup> PCM Report												
5. 10 <sup>th</sup> FCG Report												
6. 40 <sup>th</sup> Council Meeting Report												
7. Special Publication (3 issues)												
8. 10-Year Trust Fund Publication												
9. Maintaining and updating Homepage	---	---	---	---	---	---	---	---	---	---	---	---
10. Development of SSF Website	---	---	---	---	---	---	---	---	---	---	---	---
11. SEAFDEC Calendar 2009												
12. Statistical Bulletin 2005 and 2006	---	---	---	---	---	---	---	---	---	---	---	---
13. 9 <sup>th</sup> ISEP Meeting												
14. Other promotional materials/activities	Base on requirement											
15. Regional Fisheries Policy Network	---	---	---	---	---	---	---	---	---	---	---	---
16. Other activities as suggested by the Eight ISEP Meeting	---	---	---	---	---	---	---	---	---	---	---	---

#### Remarks

--- On-going activities

## **SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES FOR THE YEAR 2007-2008**

### **TRAINING DEPARTMENT**

#### **1. OVERALL REVIEW**

In the year 2007, TD strengthened public relations of TD organization and activities by means of exhibitions, souvenirs and so on. Integrated information and extension packages were produced and disseminated worldwide. The technology media as website was used to promote TD activities and information online. Those activities facilitate the target audience and public to access TD information easily, which contributes to the enhancement of its visibility.

In the year 2008, TD will continue to implement a program related to Information and Communication Technology under the Departmental program. However, some program activities will be continued while some will be adjusted and modified. Under the program, the public relations to promote TD activities will continue to be emphasized and implemented. TD online, information communication and technology were internally and externally improved and developed. TD will produce an electronic newsletter to disseminate reports and the progress of TD activities to organization network and members.

TD will develop and produce Multimedia Packages to support not only TD projects and activities but also those which are conducted by other departments to meet their requirements. The human capacity building via training courses is also implemented and development.

Furthermore, the Tailor made Training and Study Tour Program will be proposed under departmental program. The training and study tour program will be designed and created in fishery field as required and supported by the budgetary of other organization donor.

#### **2. LIST OF PROGRAMS**

- 1) Information and Communication Technology
  - Public Relation
  - Information and Communication Development
  - Development and Production Multimedia Packages
  - Human Capacity Development
- 2) Tailor made Training and Study Tour Program

## PROGRAM DOCUMENT

**Program Category:** Departmental Program  
**Program Title:** Information and Communication Technology  
**Responsible Department:** Training Department  
**Total Duration:** 1 year (Jan-Dec 2008)

### 1. INTRODUCTION

Information and communication technology is essential for the current information, extension and training programs of the Training Department to successfully give publicity to its information service and training courses around the world. Information data and equipment such as Internet and multimedia are developed and improved just in time to support SEAFDEC and Training Department activities.

The Department will carry out information activities such as compiling, designing, producing, disseminating, acquiring and exchanging of printed and non-printed information. The information is provided for the user's benefit and training purposes through the Integrated Information and Extension Packages. Various databases and information files will be designed and compiled to serve as effective tools. The Department's homepage will be updated in time to present department activities worldwide including upgrading of online library to provide effective library services for users both inside and outside the Department. The information data warehouse on web related to fishery fields will also be upgraded and increased. Moreover, SEAFDEC Public Relations will be emphasized and promoted through every channel.

### 2. PROGRAM

#### 2.1 Objectives:

- 1) To promote TD's public relations to publicize its activities and roles in the development of sustainable fisheries.
- 2) To manage and develop TD's information communication technology
- 3) To design, produce and disseminate multimedia information to all ASEAN member countries and interested users.
- 4) To collaborate with other related institutes/organizations in the development of human capacity building activity.

#### 2.2 Program Description:

In 2008, an information and communication technology program will emphasize the implementation of activities related to the department's strategy of enhancing the organization's visibilities and community worldwide. For this purpose, four main activities are designed. The first is public relations to promote TD's activities via multimedia equipment such as website, publications and active participation in fisheries events and exhibitions at both national and international levels. The second is ICT development. The activity will cover updating, reviews and improvement of TD's online website, online library, TD's news as well as producing and disseminating TD's electronic newsletter to its network and the public. The third is to continue the design and production of multi audio-visual materials and brochures in the forms of print and other medias to disseminate them to member/non-member countries. The fourth is human capacity building for the improvement of skill and experience of staff concerned for their work.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

In 2007, the Training Department continued to implement a project on Information and Communications Technology under the Departmental Program. The following activities were implemented:

#### 1) Public Relations

To enhance SEAFDEC visibility, TD took part in a number of exhibitions relating to fisheries to present and promote SEAFDEC roles in sustainable fisheries development in the ASEAN region as follows:

Date	Exhibition
13 January 2007	Children's Day
2 February 2007	Fishery Exhibition in Rajpracha High School
27 February 2007	Fishery Exhibition for Thailand Fishery Association Meeting
22 March 2007	Fishery Exhibition for Deep Sea Fishery Association Meeting
23 June-1 July 2007	Thailand Fishery Exhibition "Pramong Nomkloa"

During 28 November – 2 December 2007, TD is planning to join the national exhibition of the Celebrations on the Auspicious Occasion of His Majesty the King's 80<sup>th</sup> Birthday. Moreover, to celebrate the 40<sup>th</sup> anniversary of the establishment of SEAFDEC, TD is planning to organize an "open house" project for public relations of TD activities during 25 – 27 December 2007. This year, TD produced promotion materials such as TD plastic bags and cotton bags to raise public awareness about global warming crisis. All promotion media are disseminated to the public via exhibitions, training courses, seminars, and workshops and so on.

TD always extends a warm welcome to delegations and guests from member countries and other organizations. TD considers it as an important channel for public relations of SEAFDEC. Visitors to TD total 209 so far in the year 2007.

#### 2) Production of Integrated Information and Extension Packages

In the year 2007, nine VCDs were produced and five are in the process of production to support relevant TD projects and activities and to meet requirements from SEAFDEC member countries. They have been distributed to target groups, participants in SEAFDEC meetings, fisherman and so on. Those VCDs are as follows:

- Forty Years SEAFDEC and Fisheries Development in Southeast Asia
- Global National Coordinators Review Meeting Manila and Calbayog City, Philippines.
- The study of luring light effect to the squid's behavior (in process)
- Regional Training Workshop on Larval Fish Identification and Fish Early Life History Science
- The International Training Course in Coastal Fisheries Management for Fishery Managers
- The International Training Course on Coastal Fisheries Management and Extension Methodology.
- Training Course on Fishery Technology and Responsible for university students (No.43)
- Training Course on Fishery Technology and Responsible for university students (No.44)
- Integrated Coastal Resources Management in Sihanoukville
- Promotion of JTEDs in Perak, Malaysia (in process)
- Demonstration and Core Expert Meeting on Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea.

- The Regional Training Course on the Establishment and Management of Fisheries Refugia. (in process)
- Fisheries Refugia. (in process)
- 39th Council Meeting. (in process)

As well as the production the above VCDs, four series of research papers, one special publication and six reports of activities implemented by TD were printed and distributed to target groups in SEAFDEC member and non-member countries. Moreover, all publications are served as new information to develop capacity of those who are engaged in the fisheries field on all occasions to share and exchange information among fisheries related organizations and through networks.

<b>Title of Publication</b>
Research paper series <ul style="list-style-type: none"> <li>• The new experience of sub-district Administrative Organization in coastal resource management: the case of Chumphon Province, Thailand.</li> <li>• Tuna Purse Seine</li> <li>• Study on JTEDs in Vietnam</li> <li>• Study on JTEDs in Cambodia</li> </ul>
Special Publication <ul style="list-style-type: none"> <li>• Final Project Evaluation of Integrated Coastal Resources Management in Pathew District.</li> </ul>
Report <ul style="list-style-type: none"> <li>• Bi-annual Project Progress Report of Integrated Coastal Resources Management in Sihanoukville (ICRM-SV) July-Dec.2006.</li> <li>• Bi-annual Project Progress Report of Integrated Coastal Resources Management in Pulau Langkawi July-Dec.2006.</li> <li>• Bi-annual Project Progress Report of Integrated Coastal Resources Management in Pathew District July-Dec.2006.</li> <li>• Bi-annual Project Progress Report of Integrated Coastal Resources Management in Sihanoukville (ICRM-SV) Jan.-June 2007.</li> <li>• Woman's Group Activities in Production of Mushroom Community Fisheries Pre-survey in, Sihanoukville, Cambodia.</li> <li>• Proceeding of the Regional Seminar on Integrated Coastal Resources Management in Southeast Asia.</li> </ul>

### 3) Up date of TD Information Online

The TD Homepage (<http://td.seafdec.org>), emphasizing the movements within TD including TD activities and events, was frequently updated. The web-based technology was used as a tool for the announcement of forthcoming training activities, workshops and meetings. Interested people can apply for some training programs through the web site. Moreover, web pages of fishery information warehouse that contains knowledge and information in the fishery field and information collected through TD research projects continued to be developed.

In 2007, more web travelers in the world showed an interest in TD website. Since January until September 2007, 4,283 web travelers had visited TD website and 647 web travelers downloaded TD databases

### 4) Collaboration among SEAFDEC and AMC-Australia on Human Capacity Building

There was a consulted among SEAFDEC and AMC for collaboration on Human Capacity Building through the program of "Master of Applied Science in Living Marine Resources" The ASEAN student is the target group of this program. The course will take 1.6 years as 3 semesters for duration. The 1<sup>st</sup> and 3<sup>rd</sup> semester, student will take courses at AMC, SEAFDEC will be responded for the practical session/on the study training for some students at the 2<sup>nd</sup>



semester of their educational. There are mainly three subject categories which SEAFDEC will provide the knowledge and practical sessions to the student : 1). Advance Fishing Technology, 2). Coastal Fishery Management, and 3). Aquaculture Management. All course syllabus were prepared and complied as well as sent to the AMC for further development.

#### **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008**

The following activities will be implemented in 2008:

##### **1) Public Relations**

TD will continue public relations to promote TD activities through the production of brochures and souvenirs relating to TD projects and the dissemination of them to the public via exhibitions, training courses, seminars, etc. In addition, TD will produce interactive VCD media on the progress of TD projects and activities and then distribute them worldwide. Furthermore, TD will join in a number of exhibitions relating to fisheries both at national and international levels as well as a warm welcome to visitors

##### **2) Information and Communication Technology Development**

TD will develop and improve information and communication technology system. TD web site will be designed and modified and available for worldwide users in every location. The information database, data links, news and activities/events on TD website will be updated in time. The intranet network system will be developed to support for hi-speed usage. Moreover, TD plans to produce an electronic newsletter to disseminate reports and the progress of TD activities to organization networks and members.

##### **3) Development and Production Multimedia Packages**

TD will develop and produce multimedia packages such as VCDs, brochures, booklets and posters. TD is planning to produce VCD to promote TD projects and so on. The VCD of “Set Net Fishing and Global Warming Impact to Fisheries” will be produced. Moreover, brochures of responsible fisheries will also be designed and produced. The information and extension packages will be distributed to SEAFDEC members/non-member countries and publicity.

##### **4) Collaboration among SEAFDEC and other organizations/ institutions on Human Capacity Building**

As well as the collaborative program of “Master of Applied Science in Living Marine Resources” between TD and AMC, another program for the human capacity building through the e-learning on the Marine Ecology and Coastal Fisheries Management for Southeast Asian Student will be conducted in Australia and student’s home countries while TD will provide them with knowledge and information through the e-learning process. Furthermore, in the year of 2008, TD will negotiate with UNEP/GEF South China Sea Program for co-organizing a regional workshop on Fisheries Information and Fisheries Data Base Utilization in this region.

**Program Title: Information and Communications Technology**

<b>Projects/Activities Title</b>	<b>J</b>	<b>F</b>	<b>M</b>	<b>A</b>	<b>M</b>	<b>J</b>	<b>J</b>	<b>A</b>	<b>S</b>	<b>O</b>	<b>N</b>	<b>D</b>
1. Public Relation												
• Exhibitions												
• Souvenirs												
2. Information Communication and Technology Development												
• Update TD website information												
• Modify and design TD website												
3. Development and Production Multimedia Packages												
• Produce “Set Net Fishing” VCD												
• Produce “ Global Warming Impact to Fisheries” VCD												
• Series of Brochures for Responsible Fishery												
4. Collaboration among SEAFDEC and other organizations/ institutions on Human Capacity Building												
• Education and Training in Marine Ecology and Coastal Fisheries management through E-learning												
• Workshop on Fisheries Information and Fisheries Data Base Utilization in this region.												

## **PROGRAM DOCUMENT**

**Program Category:** Departmental Program

**Project Title:** Tailor-made Training Courses and Study Tour Programs

**Funding Agency:** Partner organizations

**Lead Department:** SEAFDEC/TD

**Duration:** 1 years (January-December 2008)

### **1. BACKGROUND/INTRODUCTION**

In each year TD has conducted several regional training courses. They are one of channels to transfer to it's member countries activities outcomes and technology which are found out or developed by SEAFDEC. Therefore the participants will come back home with a knowledge about "how they learn and how they do in SEAFDEC/TD, Thailand". However in recent years, SEAFDEC/TD has been requested to conduct some tailor made courses and study tour programs that are a direct follow-up of its advisory activities with and for, organizations in this region. Such courses/programs are referred to as tailor-made courses/programs because they are set up at the request of an organization (e.g. UNEP/GEF, Coastal Resource Management Project -Sri-Lanka, Poly-technique of Agriculture-Indonesia, etc.) and their content is tailored to meet 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 and 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 on practical application.

### **2. OBJECTIVES**

1. To provide a wide range of tailor-made training course and study tour programs in the field of fisheries and other relevant aspects at the national and international levels
2. To fully utilize the training facilities of the TD and make use of them for the member countries and the region
3. To raise fund which supports the training or study tour programs from other donors/organizations

### **3. PROJECT DESCRIPTION**

As training is at the heart of developing human and institutional capacity, TD proposes continuing tailor-made courses and study tours programs (on demand training and study tour program) as part of the training activities of the department. At the request of individual countries and/or in partnership with intergovernmental organizations, TD will organize and implement specifically designed courses on themes related to the demand /need of the partner organization. The duration, content and structure of the courses are tailored to meet the specific needs and level of the participants, and defined in close consultation with the beneficiaries and partner organizations.

### **4. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

In the year 2007, TD conducted about 11 tailor made training courses and study tour programs and will carry out another 2 tailor made study tour programs by the request of CRMP-Sri-Lanka in December 2007. They are summarized as follows:

- A study tour program on Tilapia Aquaculture in Thailand: The course was conducted from 4-15 March, 2007. The program focused upon the Tilapia aquaculture in Thailand, and

mainly dealt with visits to places related to Tilapia aquaculture and farming of government fisheries office and private sectors. Various types of Tilapia farms such as simple, semi-industrial, intensive, pond and cage systems, as well as the fish nourishment both from homemade and industrial were visited by two participants from Japan and Gabon.

- Short term training courses for University students: Two training courses of this title were held at SEAFDEC/TD, were conducted from 18 April – 1 May, and 15-26 October, 2007, respectively. The courses focused on the awareness raising and the understanding on sustainable coastal fisheries management to the new generation as young university students. Courses consisted of the presentation/discussion sessions and the ship-board training. About 40 University students attended each training course.
- The regional training course on larval fish identification and fish early life-history science: This training course was carried out under the collaboration among UNEP/GEF and SEAFDEC/TD. This joint training workshop aimed to build national teams and a regional network of fisheries practitioners with skill in the collection, processing and identification of larval and juvenile fish. It is intended that these individuals will play an important role in the processing of larval and juvenile fish samples required to enhance the scientific basis for the identification of important fish spawning and nursery areas to be included a regional system of fisheries *refugia*.
- Responsible fishing technology for instructors from Department of Pangkep State Polytechnic of Agriculture in South Sulawesi-Indonesia: The training program was designed for 2 instructors on responsible fishing gear technologies. The program was mainly focused on the discussion among the participants and TD's fishing gear technologists and instructors as well as study tour to visit related places including fishing villages for the specific fishing gears and methods observation.
- The training course on Coastal Fisheries Management for Thai Fishery Managers: This course was requested from Thailand /DOF to conduct for the Thai fishery Managers, for about 14 days of the training duration: 1-14 July 2007. This course aimed to assist managers to practice in acquiring and analyzing information from several pilot projects for their policy formulation, also to design coastal resource/fisheries management plans that suit their local areas.
- A study tour program in Community-based Coastal Fisheries Management in Thailand: Actual, TD was requested from the CRMP-Sri-Lanka to repeat the same content of this tailor made study tour program which was conducted for the CRMP officer in the year 2006. The study tour program was focused upon the community-based and coastal fisheries management in Thailand. Activities included mainly visits to the related places specially to learn about the community-based, co-management, locally-based coastal fisheries management from several successful pilot projects which are conducted under different organizations/sectors.
- A Skipper study and training course for student from Pramong Tinasulanon Collage: This five-month training course is designed for students from a fisheries collage. The aim of this tailor made training course is to foster seamen and navigators for the fisheries industrial or other related sectors both at the national and inter national levels.
- A study tour program on Lake and River Basin Management in Thailand: The study program was conducted at TD during 1-11 October, 2007. 15 of CRMP officers, Sri-Lanka, participated in this program. The study tour program focused on the lake and river basin management, mangrove conservation, alternative livelihood for coastal resource abusers and community education and awareness for coastal resources. The program consisted of

the presentation/discussion including visits to places really relevant to the program title according to interests of the participants.

- Regional Training Workshop on the Establishment and Management of Fisheries *Refugia* in the South China Sea and Gulf of Thailand: This regional training workshop was conducted in the corporation between UNEP/GEF/SES and SEAFDEC/TD with the aim to build regional capacity for the future development of the regional system of fisheries *refugia* in the South China Sea and Gulf of Thailand. There were 25 participants from 9 different countries in this workshop. The financial support for the tailor made training course was from the UNEP/GEF, Japanese Trust Fund and SIDA Sweden.
- A study tour program on Aquaculture and Fisheries Product/Processing in Thailand: There are two participants in this program. The program was focused upon the aquaculture, including fisheries products of quality control, development of value-added fisheries and aquaculture products. The program consisted of the concept on the Good Aquaculture Practice Auditor for Shrimp Farm Standard, Develop of value added processed fisheries products as well as some special techniques for aquatic animal and plant genetic development, plant tissue cultivation, making fish source, shrimp paste, and etc.
- The study visit to Thailand of the Secretary, Ministry of Fisheries & Aquatic Resources: The study tour is planed to be held at TD during 11-15 December, 2007. The study tour will focus upon the discussion with high level/senior resource persons of DOF/Thailand and SEAFDEC. The discussion topic will be on the possibility of the collaboration amount SEAFDEC, DOF with the Ministry of Fisheries & Aquatic on the training activities as well as the coastal fisheries management in Thailand.
- The study tour on the Coastal Resource and Fisheries Management in Thailand and Australia of the Director of CRMP-Sri-Lanka: The study tour will be conducted in Thailand and Australia, The eight-day program is planned to be conducted in this coming December. It will include visits to several places as well as some discussion sessions on overview of coastal fisheries management projects which are implemented under SEAFDEC and Department of Environment and Heritage Commonwealth Marine Protected Areas, NSW Department of Fisheries Industry and Conservation, etc.

There will be about 155 participants in the tailor-made training courses and the study tour program conducted by SEAFDEC/TD in the year of 2007.

## **5. PROPOSE FUTURE ACTIVITIES FOR THE YEAR 2008**

At least five tailor made training courses and study tour programs will be conducted in the year 2008, the training course and study tour program which event where all aspects are defined by the partner in consultation with the training partners. This includes the choice of subjects, duration, location, and the target group). Courses/programs can be constructed by combining existing training programs or a totally new topic will be developed.

The following activities will be implemented in the year 2008

**Program Title: Tailor made training courses and study tour programs**

<b>Projects/Activities Title</b>	J	F	M	A	M	J	J	A	S	O	N	D	<b>Remarks</b>
1. University student training course 2008													
• University student training course' 45													
• University student training course' 46													
2. Skipper study and training course for student from Pramong Tinasulanon Collage													5 months: From October 2007 – March 2008
3. On demand training and study tour program													



## SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES FOR THE YEAR 2007-2008

### AQUACULTURE DEPARTMENT

#### 1. OVERALL REVIEW

The Research and Development (R&D) programs of the Southeast Asian Fisheries Development Center Aquaculture Department (SEAFDEC/AQD) which have been approved for implementation during 2006-2010 (28<sup>th</sup> SEAFDEC Council Meeting Report, 2005) are the: (i) Departmental Programs; and (ii) Programs under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) Collaborative Mechanism. Under the Departmental Programs, AQD, in 2007 continued implementing the following Programs: (i) Marine fish, (ii) Mud crab and shrimp, (iii) Mollusk, (iv) Small-holder freshwater aquaculture, (v) Seaweed and (vi) Aquatic ecology. The activities under these have focused on research and verification of aquaculture technologies in support of the intensified FCG Programs in the ASEAN region. The following provide the highlights of achievements of AQD Departmental programs in 2007.

Marine Fish Program conducted studies aimed at refining the breeding and seed production of milkfish, rabbitfish, grouper, snapper and seabass. The development of breeding and seed production technologies for pompano (*Trachinotus blochii*) has also been added to the program in 2007 and initial work was done to study its reproductive biology. The Program also continued investigating the potential use of insulin-like growth factor II (IGF-II) mRNA expression as molecular marker for quality of fish eggs and larvae of grouper, milkfish and rabbitfish. As part of the activity to develop and refine the grow-out culture techniques for the production of marine fishes, studies have also been conducted to assess the effectivity of AQD formulated diets in the performance of milkfish in marine cages; snapper and sea bass cultured in ponds, and grouper, in ponds and floating net cages. To improve the production during various growth phases of marine fishes, efforts were also made to improve the nutritional value of live foods and locally available feed resources for practical aquatic feeds. The effects of various immunostimulants on innate immunity and resistance to bacteria of grouper were also evaluated. Experiment was also continued to assess the effects of metaldehyde to control the snail population during grow-out culture of milkfish.

Under the Mud Crab and Shrimp Program, the 2007 studies on mud crab focused on domestication of *Scylla serrata*, refinement of broodstock management and seed production techniques, and improvement of culture techniques during the nursery and grow-out phases. Concerning the shrimps, activities were continued to monitor the status of *P. monodon* captive broodstock development in the Southeast Asian region and the possible impact of the introduction of *P. vannamei* in the region. Assessment was also made on the genetic quality of *P. monodon* broodstocks collected from different Philippine sites as well as improvement of maturation of pond-reared broodstocks. As part of the initiative aimed to refine the broodstock management and larval rearing of *P. indicus/merguiensis*, experimental runs were conducted to compare the SEAFDEC-developed probiotics with antibiotics and other commercial treatments. During this run, luminescent bacteria were found in all broodstocks except in those treated with SEAFDEC-developed probiotics. The use of SEAFDEC-formulated shrimp diet was also tested during grow-out of *P. vannamei* in brackishwater ponds using environment-friendly scheme.

Mollusk Program conducted experiments aimed at improving the techniques for broodstock maturation, larval management and transport protocols of donkey ear abalone, *Haliotis asinina*. The effects of light intensity and photoperiodicity on the settlement rate, feeding behaviour, growth and survival of post-larvae were assessed. The lipid and essential fatty acid requirements of juvenile abalones were also evaluated. Efforts were continued to verify the hatchery



techniques and grow-out culture using mesh sea cages in a modular system. This also includes pilot testing of abalone hatchery technology in collaboration with a private sector.

With regard to the Small-holder Freshwater Aquaculture Programs, studies in 2007 focused on improving the seed production and grow-out technologies for commercially important freshwater commodities (tilapia, catfishes, carps and freshwater prawn). Experiment was done to compare the growth and survival performance of native catfish fry in hapa net cages with or without supplemental feeding. The reproductive performance and fry production of bighead carp in net cages installed in Laguna de Bay using different feeding regimes were also assessed. An experiment aimed to improve the carcass traits in Nile tilapia through farm-based mass selection and interspecific hybridization was also continued. Concerning the freshwater prawn, studies were conducted to characterize genetically and morphometrically the hatchery stocks from Thailand and wild stocks from different sampling sites in the Philippines. To reduce the cost of giant freshwater prawn seedstock production, AQD has also conducted trials to develop stocks that are tolerant to low salinity. Initiation of the studies that will assess the bioeconomics of freshwater prawn hatchery production in different larval rearing systems has also been made. The performance of different strains of *M. rosenbergii* during grow-out culture in lake based cages was also assessed. Survey to assess the social and economic impacts of aquaculture development in Laguna Lake was conducted and data are being analyzed.

Concerning the Seaweeds Program, activities were continued to produce 'new' and improved varieties of *Kappaphycus* through tissue culture, sporulation, and protoplast fusion techniques. Growth experiment in concrete tanks was undertaken from spores .

In order to address the issues related to sustainability of the aquatic environment, AQD initiated in 2007 the program on the Aquatic Ecology. Preliminary assessment was made on the environmental capacity of Humaron Cove, Igang, Guimaras and Bugang River, Pandan, Antique; and the operations, catch volume, species composition, economic importance and ecological impact of the tangab fishery in Iloilo Strait (Western Visayas).

Apart from research and verification studies, significant efforts were also made to facilitate the transfer of viable technologies to various stakeholders through training and information dissemination. Activities comprised the conduct of international/local training and other institutional capacity building programs, participation of researchers in scientific conferences, various technology fora and exhibitions, and publication of information materials.

As of November 2007, AQD has conducted 17 formal training programs on various aspects of aquaculture and has trained over 200 participants, mainly government workers, private sector practitioners from the Philippines and representatives of partner countries from the ASEAN region. Apart from this, 156 students, mainly from the Philippines, and some foreign interns have also been trained during the year.

To enhance visibility locally and internationally and disseminate viable technologies, AQD participated in five exhibits/fairs in the Philippines which were organized as a complementary activity to industry or government-led congress. Apart from publication in peer-reviewed journals, AQD produced and disseminated five farmer-friendly how-to manuals on various commodities (giant clam, tilapia and seaweed), three flyers and nine large-format posters. About 70 news articles on AQD or SEAFDEC have also appeared in the Philippine mass media. AQD also published in-house information materials such as the AQD annual report (*Highlights 2007*), newsletter (*AQD Matters*) and contributed 8-10 news articles of *SEAFDEC Newsletter* which is circulated to SEAFDEC member-countries. Apart from publications, efforts were also made to improve the AQD website. During the year, this was updated six times and received an average of 877 to 2,298 web hits per month. The AQD Library served over 5,560 library users, both outsiders and from the AQD community. The Library also answered 22 queries from 13 countries and delivered 15 titles to outside users.

To ensure that many will benefit from products of AQD's research, efforts were made to expand and enhance collaborations. As of November 2007, AQD has established new collaborative arrangements with 13 different stakeholder groups (i.e. government agencies, local government units, international organizations, private companies, private sector entrepreneurs).

Another activity that AQD has just embarked on and will cater to interested entrepreneurs in the Philippine aquaculture is the ABOT (Agree-Build-Operate-Transfer) AquaNegosyo. This initiative develops science-based aquaculture business packages that are suitable to the needs, interests and capacity of its clients. As part of this activity and to help support the government's goal of increasing fish production through aquaculture, AQD held a 2-day AquaNegosyo Forum in October 2007 in Quezon City, Philippines. About 200 participants from the private and government sectors attended the Forum.

To ensure relevance of AQD's work and position itself with respect to present and future environment and partners, in-house workshops were held to review the existing mandate, management operations, and work programs. The main outputs of these meetings are the revised mandate of AQD and a new Strategic Plan which sets forth the program of work for each Division from 2007 until 2010.

Most of the activities conducted in 2007 will be continued in 2008. The Departmental Programs for next year will comprise the following: (i) Marine Fish; (ii) Mud Crab and Shrimp; (iii) Mollusk; (iv) Seaweed; (v) Small holder Freshwater Aquaculture; and (vi) Aquatic Ecology. The year 2008 is also expected to see significant progress in other R&D activities, specifically on 'ABOT AquaNegosyo and Institutional Capacity Development on Sustainable Aquaculture'. To facilitate the transfer of viable aquaculture technologies to various stakeholder groups in the Philippines and elsewhere in the ASEAN region, AQD will provide greater focus on verification and packaging of these technologies for uptake of various stakeholder groups.

## **2. LIST OF PROGRAMS**

### **Departmental Programs Implemented by AQD in the year 2007:**

- a) Marine Fish
- b) Mud Crab and Shrimp
- c) Mollusk
- d) Small-holder Freshwater Aquaculture
- e) Seaweed
- f) Aquatic Ecology

### **Proposed Departmental Programs of AQD for the year 2008:**

- a) Marine Fish
- b) Mud Crab and Shrimp
- c) Mollusk
- d) Small-holder Freshwater Aquaculture
- e) Seaweed
- f) Aquatic Ecology

## PROGRAM DOCUMENT

**Program Category:** Departmental Program

**Program Title:** Mollusk

**Responsible Department:** Aquaculture Department

**Duration of Program:** Five years (2006-2010)

### 1. INTRODUCTION

In recent years, there was a fast decline in abalone production from the natural fishery of major abalone producing countries including the Philippines due to heavy exploitation of this resource. The decreasing commercial catch and the high price of abalone both in the domestic and export markets have stimulated interests in the development of its aquaculture for commercial production and for restocking purposes to enhance its fishery resource.

To help address the needs of the aquaculture industry on abalone, the Mollusk Program of SEAFDEC/AQD focuses its work on tropical abalone, *Haliotis asinina*. AQD has been in the forefront of developing the technology for controlled hatchery seed production and culture of *H. asinina*. Significant results have been achieved in terms of consistent spawning of captive broodstock year-round, improved larval settlement and survival due to improved techniques in large-scale production of diatoms as food for larvae resulting in increased early juvenile production.

In addition to abalone, studies on the biology and fishery as well as developing the hatchery seed production techniques of indigenous mollusk species such as the angelwing *Pholas orientalis* and sea cucumber *Holothuria* sp. are being conducted.

### 2. PROGRAM

#### 2.1. Objectives

The main objective of the Program is to develop and demonstrate economically viable mollusk production technologies and make mollusk production an important industry in suitable coastal communities. The specific objectives are to: (1) refine management and spawning techniques for captive broodstock, (2) improve seed production technology through environment manipulations and enhancement of growth of natural food (mainly diatoms) favored by the abalone, and by understanding the role of microbial communities in the survival of newly settled larvae; (3) determine the nutritional requirements of juveniles in view of the development of alternative feeds for nursery as well as for grow-out; (4) compare the economic viability of producing advanced juveniles in tanks and sea cages set in open waters and develop viable technology package for the intermediate nursery culture of abalone; and (5) develop a technology package for marketable abalone production.

#### 2.2. Program Description

The Integrated Mollusks Program has the following components: (1) broodstock management and breeding to refine the spawning and egg and larvae production techniques, (2) primary nursery rearing and natural food production to improve on larval settlement and metamorphosis, increase early juvenile production and develop protocols for sufficient natural food (mainly epiphytic diatoms) production, (3) intermediate nursery culture to develop a rearing technology package for juveniles and assess its economic viability under land-based nursery tank system as well as in floating net cages in open-waters, (4) nutritional studies to determine the nutritional requirements of abalone juveniles in view of developing artificial diets as replacement for seaweeds; and (5) grow-out culture in bottom-set and suspended cages to demonstrate the

technical and economic viability of abalone marketable-size production. This program has a linkage with the Stock Enhancement/Sea Ranching Program in that it provides hatchery-produced juveniles or seeds for stocking.

### **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

#### **Improvement of hatchery techniques for the donkey's ear abalone *Haliotis asinina***

Experiments were conducted on broodstock maturation, larvae management and transport protocols for larvae and juveniles. Results on broodstock maturation in indoor and outdoor holding tanks were similar in terms of gonadal maturation and rematuration frequency, and spontaneous spawning. In larvae management, stocking of larvae immediately after collection or 6 hours later showed better survival at day-10 than those larvae held for 12 or 24 h after retrieval. Delaying the stocking or holding the larvae for 12-24 h after retrieval induced higher mortalities ranging from 20-40%, respectively.

For simulated larval transport experiments, trochophore larvae loaded at 50,000/liter and transported within 6 h in oxygenated plastic bags at 20-22°C had better survival than those loaded at 25 or 100 larvae/liter or when transported at higher temperature (24-25°C). For juveniles, higher survival (80-95%) was obtained in bigger juveniles (20-23 and 25-29 mm shell length) and transported at temperature of 24-25 after simulated transport within 30 h than in small juveniles (10-19 mm shell length) or transported at 18-21°C.

#### **The effects of light intensity and photoperiodicity on the settlement rate, feeding behavior, growth and survival of abalone (*Haliotis asinina*) post-larvae**

Under standard hatchery rearing conditions, microscopic examinations were done on day1 to day 15 larvae to examine the presence of food in the gut. No ingestion was observed on day 1 to day 4 larvae. The presence of food in the gut was observed starting day 5 until day 15.

The number of swimming larvae was monitored on day 1 to day 4. On day 1 – day 2, swimming larvae were found in the water column. On day 3, some larvae were swimming in the water column and some larvae had settled in the plate. Starting day 4 no larvae can be observed in the water column.

Two fifteen days experiments were conducted in one-liter plastic container. During the first run, mass mortality occurred a day after stocking, while a very low settlement (insignificant) was recorded on the second run. To evaluate the cause of poor settlement in the above runs, a five-day experiment was conducted indoor in the same rearing container. The four parameters tested are as follows; A-no aeration, B-with aeration, C-no aeration + flow through on the 3<sup>rd</sup> day and D-with aeration + flow through on the 3<sup>rd</sup> day. Results showed higher percentage of swimming larvae (8.6%) in treatment A after 3-5 days of rearing. The percent settlement of larvae after 3-5 days of rearing was similar (3.4-3.5%) in treatments A and D. The percentage settlement of larvae at different location (light intensity) and reared in 1 liter plastic container is not distinct. At different locations, ingestion of diatoms starts at day 3.

#### **Lipid and essential fatty acid requirements of juvenile abalone, *H. asinina***

Preliminary results showed the proximate composition of the abalone meat in percent dry basis: 67% protein, 3% crude fat, 16% nitrogen-free extract, and 11.4 crude ash. Feed formulation is in process.

## **Verification of some hatchery techniques for the donkey's ear abalone *H. asinina***

During the third quarter (July-August only), more than 25 million veligers were produced from 48.87 million trochophore eggs collected or about 61.3% survival. A total of 147 females were spawned during the two-month monitoring of spontaneous spawning. Total early juvenile production during July-August was 46,418 individuals. Production of pure cultures of diatoms amounted to 287 liters from where the 51 tons of *Navicula* and *Amphora* were produced in outdoor culture tanks at Phycology Wet Lab. At the abalone nursery outdoor tanks 62 tons of diatoms were produced that were used for seeding in abalone.

### **A modular system of culturing abalone, *H. asinina* in mesh sea cages**

Abalone juveniles with initial body weight of 0.84 g and shell length of 16.4 mm were stocked at 600 per unit of circular mesh cage. After three months, the stocks were reduced to 300 stocking density/cage and were distributed to similar cages. After 5 months of culture, abalone attained an average body weight and shell length of 17.2 g and 42.3 mm, respectively. Average daily growth rates in weight and shell length were 109 mg day<sup>-1</sup> and 172.67 µm day<sup>-1</sup>, respectively. FCR is estimated at 14 with mean survival rate of 80 %.

The second batch of juveniles attained after a 60-day culture period a mean daily growth rate of 73.5 mg day<sup>-1</sup> and 208.33 µm day<sup>-1</sup>. FCR is estimated at 8 with mean survival rate of 96 %. Both batches exhibit high growth rates, good FCR and SR.

### **Other Activities**

*Extension.* A Pilot-testing of abalone hatchery technology in collaboration with a private sector was conducted from August 2006 to August 2007. The cooperator was selected on his capacity to provide basic facilities for the rearing of abalone postlarvae until the advanced juvenile stage and has undergone intensive internship training at the SEAFDEC abalone hatchery. From September 2006 until June 2007, the cooperator availed a total of 10 million veliger larvae that produced around 116,557 early and advanced juveniles or an average survival of 1.64% (range: 0 - 6.4%).

*Training.* A 21-day International Training course on Abalone Hatchery and Seed Production was conducted on 6-26 September 2007. A total of 18 participants from Malaysia, Myanmar, Indonesia and Philippines from both the government and the private sector, attended the course. Two of the foreign trainees SEAFDEC-member countries and two from Philippines were funded by the Government of Japan-Trust Fund while the rest were paying participants.

On-the-Job and Internship training are conducted at the Abalone Hatchery and Nursery Facility in coordination with the Training & Information Division. Students from nearby colleges and universities as well as private individuals had their summer job training and internships at the Hatchery.

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

##### 4.1. Planning for project activities

Project/Activity Title	Duration	Remarks
Improvement of hatchery techniques for the donkey's ear abalone <i>Haliotis asinina</i>	2 years	This activity will involve the rearing of broodstock under different controlled conditions to determine some bio-physical factors that regulate spontaneous maturation, rematuration and spawning of captive broodstock. Another activity will determine some environmental factors causing heavy mortalities in settling larvae on artificial substrates prior to metamorphosis.
Verification of some hatchery techniques for the donkey's ear abalone <i>H. asinina</i>	2 years	This activity will standardize some existing hatchery techniques to demonstrate an economically viable abalone seed production technology.
The effects of light intensity and photoperiodicity on the settlement rate, feeding behavior, growth and survival of abalone ( <i>H. asinina</i> ) post-larvae	1 year	This activity aims to establish illumination levels and the appropriate photoperiodic regime that will enhance settlement and promote better growth and higher survival in abalone postlarvae.
The effect of water chlorination and plastic sheet enclosure in the larval rearing of abalone larvae (hatchery phase)".	1 year	This activity aims to find alternative water treatment that is cheaper and easier to adopt by the abalone hatchery operators.
Lipid and essential fatty acid requirements of juvenile abalone, <i>H. asinina</i>	2 year	This activity provides the option for alternative feeding regimes for abalone juveniles using formulated diets. Feed formulations shall be based on the nutritional requirements of the animal at specified growth stages.
A modular system of culturing the tropical abalone, <i>H. asinina</i> in mesh cages	3 years	This activity will develop the technology for marketable-size production of abalone in floating sea cages. Juveniles will be stocked in a modular system to optimize the use of rearing cages and a regular harvest schedule every three months after the first 9-10 months of culture

##### 4.2. Envisaged Outcomes of the Proposed Projects/Activities

- 1) A more thorough understanding of the effects of environmental, biological and physical factors regulating spontaneous spawning in captive abalone broodstock. Results of these studies shall explain about the phenomenon of asynchronous but regular and year-round spontaneous spawning among tank-held broodstock.

- 2) Improved spawning efficiency in terms of higher percentage successful spontaneous group spawning of tank-held broodstock, thus a corresponding increase in egg and trochophore and veliger larvae production
- 3) Increased percentage of egg hatching and survival of creeping veligers through proper larvae retrieval and improved water management during incubation.
- 4) Improved techniques on larval settlement and metamorphosis through proper feeding techniques using cultured diatoms and proper combinations of some environmental factors conducive to better growth and survival.
- 5) A cost-effective nursery rearing techniques for land-based and sea cage nursery systems by using good quality designed cages and following efficient rearing protocols.
- 6) A grow-out culture technology in floating sea cages utilizing indigenous materials and wild and/or cultured seaweed resources. A modular rearing strategy will be developed in order to have harvest schedules every three months after the first 9-10 months of culture.

## PROGRAM DOCUMENT

**Program Category:** Departmental Program  
**Program Title:** Mud Crab and Shrimp  
**Responsible Department:** Aquaculture Department  
**Duration of Program:** 4 years

### 1. INTRODUCTION

The culture of native species, particularly *Penaeus monodon* has continued to rely totally on the use of wild-caught broodstock and spawners. Good quality wild broodstock and spawners have become scarce due to overexploitation and higher prevalence of diseases. Hence, the use of domesticated exotic species like *P. vannamei* became attractive. However, the relatively faster growth rate and larger size of *P. monodon* still makes it the most ideal species for culture.

The use of wild shrimp stock results in unpredictable production outcomes attributable to inconsistent quality of the source of nauplii. A breeding program where only those with beneficial heritable traits are selected for reproduction can improve the quality of broodstock and seed. Previous works in *P. vannamei* indicated that reproductive quality could be improved by selective breeding. However, before a breeding program can be initiated, a technology for the sustainable production of captive broodstock must first be developed.

The entry of exotic shrimp *P. vannamei* into the country reflects the need to augment the supply of good quality source of shrimp nauplii or look for alternative species. The breeding of *P. indicus* and *P. merguensis*, both white shrimp indigenous to the Philippines, are worth investigating. Past experience on larval rearing and pond culture trials can be used as basis for future studies and for establishing a breeding program similar to *P. monodon*.

The other focus of work of AQD under the Program is on Mud crabs. *Scylla* spp. support one of the most valuable fisheries in the Indo-Pacific region. The significant decrease in both landings and mean capture of mud crabs highlights the need to manage the resources and develop commercially viable hatchery techniques. The basic hatchery-nursery protocol has been developed at SEAFDEC/AQD. However, there is still a need to refine the existing technology to ensure economic viability. Nutrition, disease and water quality and cannibalism are the major areas that need to be investigated to improve the survival in the hatchery and nursery phases.

Production of crabs in nursery and grow-out ponds and pens are dependent on fish by-catch. However, fish can be expensive and is not always available. Likewise, the fish as aquafeed reduces the available low cost protein needed by local people. Therefore, the dependence on use of fish for crabs should be reduced by developing or improving existing formulated diets

Since all aspects of culture phases (broodstock, hatchery, nursery and grow-out) are now being done, these can be integrated to produce domesticated broodstock. Domestication of mud crab is a prerequisite to selective breeding program, which allows for strict disease prevention and control and present opportunities for improvement of farmed stock.

### 2. PROGRAM

#### 2.1. Objectives

**Shrimps:** The long term goal is to develop a viable technology for production of captive broodstock of native shrimp species particularly, *P. monodon*, *P. indicus* and *P. merguensis* that can be genetically selected for desired heritable characteristics, particularly disease resistance or fast growth. The short term goals are: 1) to develop the technology to produce



viable *P. monodon*, *P. indicus* and *P. merguensis* broodstock in captivity and determine the economic viability of such activity, 2) to maintain different family lines of *P. monodon*, *P. indicus* and *P. merguensis*, 3) to evaluate the commercial viability of *P. indicus* and *P. merguensis* hatchery and grow-out culture, and 4) to adopt environment-friendly methods.

**Mud Crabs:** The activities on mud crabs aim to develop a technology for suitable production of captive broodstock and good quality seed. The specific objectives are to: 1) test the viability of concentrated microalgae for culture and feed for rotifer, and acceptability for crab and fish larvae after storage, 2) improve survival of *Scylla* spp. through refinement of broodstock management and hatchery rearing techniques, 3) improve survival of crab instar to juvenile stage through behavioral studies and strategies to culture cannibalism, and 4) reduce the use of fish by-catch in nursery and grow-out culture.

## **2.2. Program Description**

The shrimp program consists of two main studies: 1) *P. monodon* broodstock development, which includes experiments aimed at developing a technology for the production of broodstock size shrimps and refining techniques for production of nauplii and postlarvae from captive broodstock; and 2) *P. indicus/P. merguensis* broodstock development, which includes experiments aimed at improving nauplii production using captive broodstock, refining techniques for larval rearing and evaluating the economic viability of hatchery operations.

Concerning the Mud Crab, the activities comprise four components: (1) natural food production which includes mass production of microalgae and testing of their viability for culture after storage and the use of rotifer feed and determination of its acceptability to crab and fish larvae, (2) seed production which includes studies on refinement of protocols for broodstock management and larviculture of *Scylla* spp., (3) nursery which focuses on verification trials such as provision of adequate nutrition using formulated diet and 3-dimensional shelters to reduce cannibalism, and (4) grow-out which focuses on the reduction of fish by catch as feed for crab culture in ponds and pens.

The activities are linked with the program on Promotion of Sustainable Aquaculture in ASEAN Region and Stock Enhancement.

## **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

### **3.1. Shrimps**

#### **a. Enabling aquatic animal health capacity through geographic information system (GIS): Diseases of Crustaceans**

A draft webpage has been constructed for fish and crustacean diseases, but refinement of structure is still on-going. Webpage design is being optimized to accommodate GIS maps as well as relevant information related to the target diseases such as description, photos of disease signs, and links to references. GIS mapping of target diseases is a regular activity and data have been grouped to show maps by species, disease, and period of occurrence.

**b. Development of specific pathogen-free shrimp (*P. monodon* and *P. vannamei*) broodstock** (under ASEAN-Government of Japan Trust Fund)

***Information exchange on status of P. monodon captive broodstock development in Southeast Asian region and the possible impact of the introduction of P. vannamei in the region***

*P. monodon* breeding program. Multiplication centers have been established in Thailand, Vietnam and India for SPF *P. monodon* fry produced in Hawaii. Shrimp Culture Research and Development Company Ltd in Thailand had produced F<sub>6</sub> domesticated *P. monodon*. Thai Union Feed Mill formed joint venture with HH Aquaculture to produce SPF fast growing and TSV resistant shrimp nauplii and postlarvae. Indonesia has not gone into breeding program. In Malaysia, the performance of SPF *P. monodon* improved 50-80% in grow-out pond. In the Philippines, maturation in captivity was achieved even without ablation but spawning was attained only after ablation. Two batches of F<sub>1</sub> have been produced.

*P. vannamei* and other exotic shrimps. Various countries in Southeast Asia have already gone into the breeding and culture of white shrimp as an alternative to *P. monodon*. In Indonesia, *Penaeus vannamei* stocks were imported legally in 2000, fry were grown in ponds and from these, broodstocks were selected for use of private hatcheries. In Thailand, legal importation of *P. vannamei* has been allowed since mid 2002 but on the condition that these are free of viruses. In Brunei Darussalam, after the successful verification trials on breeding and culture of *P. stylirostris*, farmers had started growing this species in their ponds in 2000. In Singapore, biosecure facility has been established by Shrimp Improvement System, USA in 2005. Postlarvae are grown to broodstock size and sold to operators in Malaysia, Indonesia and Myanmar. Vietnam has also joined the league of white shrimp producers.

In the Philippines, specific pathogen-free *Penaeus vannamei* broodstocks imported legally from USA were bred and postlarvae were distributed to accredited shrimp farmers. In 2007, the ban that prohibits the entry of exotic shrimps and prawns in the country was lifted, thus shrimp growers are now openly growing this species. Soaring postlarvae demand has led to the selection of market size *P. vannamei* from ponds by enterprising private sectors and utilization of these as source of broodstock for local hatcheries. This could start the spread of exotic diseases if proper screening is not implemented. There are already reports of *P. vannamei* occurrence and catch in local waters due to mass release of stock by scared growers before the lifting of the ban and floods.

***Genetic characterization of Penaeus monodon broodstock***

Pleopod samples from *P. monodon* collected from Bohol, Roxas and Bacolod in November 2006 are being processed. Preliminary observation show genetic differences between stocks based on restriction morphs obtained after digestion with restriction enzymes: *MspI* and *EcoRI*. Restriction morphs obtained from RFLP analysis using *RsaI* and *HaeIII* show monomorphic patterns in all three stocks.

***Studies on improvement of maturation of pond-reared P. monodon broodstock***

Two batches of pond-reared *P. monodon* have been grown to broodstock size. Batch 1 females were matched with batch 2 males and vice versa. Even without ablation, 4 females have matured, but spawning was achieved only after ablation. A total of 2 batches of F<sub>1</sub> have been produced, but the fecundity (32,000) and hatching rate (15%) was low. The first batch of F<sub>1</sub> has grown to 5-10 g while the other batch is still at the PL15 stage. The bigger juveniles from F<sub>1</sub> batch 1 were stocked in another tank and will later be used as broodstock when the desired size has been attained.

Separation of males and females was done for the first batch to observe its effect on percent mating. Males and females that were previously separated then mixed had 50-60 % mating and those that were mixed from the start of culture had 67-100%.

Wild fry have been obtained from Antique and Palawan to augment the shrimp stocks currently held for broodstock.

**c. *Penaeus indicus*/*P. merguensis* broodstock development: 1. Refinement of broodstock management and larval rearing of *P. inidcus/merguensis***

Two runs have been conducted to compare the SEAFDEC-developed probiotics with antibiotics and other commercial water treatments. The first run (treatments: oxytetracycline (Oxy), an antiviral commercial product (Vir), a sulfadiazine antibiotic (Tri) and the SEAFDEC-developed probiotic (SFDC)) showed that survival at PL1 and PL15 was similar for all treatments; however, survival rates were very low. In the second run, 2 more treatments were included namely; a commercial probiotic (Pro) and a probiotic from France (Fr). At PL1, Oxy ( $27.9 \pm 3.2$ ) had significantly higher survival than all other treatments, but at PL15 Oxy ( $20.0 \pm 1.7\%$ ) and SFDC ( $16 \pm 1.8\%$ ) gave similar survival rates. During this run, luminescent bacteria were found in all stocks except in those treated with the SEAFDEC-developed probiotic.

Six batches of F<sub>2</sub> have been produced and are now being reared to broodstock size. Additional batches of parental stock (Po) have produced 4 batches of F<sub>1</sub>.

**d. Verification of *Penaeus indicus* grow-out diets in ponds using environment-friendly scheme**

Due to lack of enough white shrimp *P. indicus* postlarvae, *P. vannamei* postlarvae were stocked in ponds. The use of SEAFDEC shrimp diet (29% crude protein) and a leading commercial *P. vannamei* feed (52% crude protein) were some of the major changes done to undertake the study. Biosecurity measures such as installation of peripheral net fences to eliminate possible WSSV carrier crustaceans, successive chlorination of culture water, provision of foot bath and hand wash with disinfectants, and application of probiotic were employed. A total of 150 pcs 'hatirin' milkfish were stocked at the central sludge collector while a 1:1:1 ratio of milkfish : tilapia : siganids were partially stocked at the corner sludge. Similarly, the reservoir (pond 16) was stocked with milkfish, tilapia and siganids as biomanipulators.

**e. Studies on the nutritional quality assessment of feeds and feedstuffs and their effects on growth, health conditions, immune response, aquaculture production, and environmental degradation of marine invertebrates commonly cultured in the Philippines: New aquaculture technology for various penaeid species**

Newly approved study.

**3.2. Mud Crabs**

**Domestication of mud crab *Scylla serrata***

Mud crab *S. serrata* from Cagayan, Camarines Norte, Northern Samar and Surigao were obtained for genetic diversity analysis and husbandry. Crabs were screened for White spot syndrome virus (WSSV), Infectious hypodermal and hematopoietic virus (IHHNV), Gill associated virus (GAV), Yellow head virus (YHV) and Taura syndrome virus (TSV). Crabs were selected and maintained in maturation tanks.

Results of screening showed that all crabs from Camarines Norte, Samar and Surigao were negative for the five viruses. Crabs from Cagayan were negative for the viruses except for 2 crabs (out of 5 crabs examined) which were found to be positive for IHNV. To date, crabs from this first generation are in the megalopa and juvenile stages.

### **Refinement of broodstock management and seed production techniques**

*Broodstock.* The reproductive performance of mud crab *S. serrata* broodstock maintained in outdoor (T1) and indoor (T2) maturation tanks with sand substrate was determined. The duration from spawning to hatching of ablated crabs ranged from 7 to 13 days in T1 while from 8 to 12 days in T2. The number of females whose eggs hatched was 60% for T1 and 40% for T2. The mean total number of zoeae/female was 3.98 million for T1 and 3.02 million for T2.

*Larvae.* Two runs have been conducted to compare commercial (T1) and SEAFDEC-developed (T2) probiotic with antibiotic (T3; control) in crab larviculture. Larval mortality in T1 and T2 was apparent at day 6 and 8, respectively. All larvae in T1 and T2 were discarded at day 11 due to mass mortality. Luminescent bacteria count in the rearing water reached up to  $10^4$  cfu/ml for T1 and T2 while the count in T3 was less than  $10^2$ . The survival from zoea to megalopa was 3.8% in T3.

Various shrimp larval formulated diet available commercially and SEAFDEC formulated diet have also been tested for crab larviculture. Crabs fed rotifers served as the control. Larvae in all treatments were fed *Artemia* starting zoea3 (day 7 or 8). Mass production of larvae in one- and 10- ton tanks is a continuous activity in the hatchery.

### **Nursery culture of *S. serrata* in net cages fed formulated diet**

*S. serrata* megalopae stocked in tanks were fed several levels of formulated feed (2g to 6 g/ton/day). After 30 days, the survival in all levels ranged from 20-51%. Highest survival was noted at 6 g/ton/day feeding. This level of formulated diet was used in the succeeding run in comparison with natural food (fish and mussel) alone or in combination.

Highest survival was obtained in crabs fed mussel + formulated diet ( $40 \pm 2.26\%$ ) and pellets alone ( $37.9 \pm 2.39\%$ ) followed by mussel alone ( $30.4 \pm 2.29\%$ ) and trash fish + formulated diet ( $28.8 \pm 1.58\%$ ).

### **Production of mud crab juveniles in different nursery systems**

*Phase 1.* Eight net cages installed in 800 m<sup>2</sup> nursery pond were stocked with megalopae at 50 ind/m<sup>2</sup> to determine the efficiency of two substrate types. Four of the net cages were provided with ribbon-like zigzag net substrates hanged in the water column (T1) and the other four cages with net substrates positioned on the bottom (T2). Megalopae were fed mussel meat in satiation. After 30 days, the survival of crabs ranged from 43-53 % in T1 while 23-41% in T2. T1 had mean body weight of 2.0 g while T2 attained 1.63 g. Crabs in T1 and T2 had comparable carapace width (CW).

The high salinity (35-38 ppt) recorded in Phase 1 could have affected the low survival and growth of the crabs.

*Phase 2.* Crabs harvested in Phase 1 were stocked in 8 units of 20 m<sup>2</sup> net cages to compare the performance of crabs at 10 ind/m<sup>2</sup> using hanged (T1) and submerged substrates (T2). The pincers were trimmed and treated with iodine prior to stocking. Crabs were fed mussel meat or fish in satiation. After 30 days, survival in T1 (63%) was higher than in T2 (51.6%). Likewise, mean BW and carapace width in T1 (6.08 g and 3.3.6 cm) was higher than in T2 (5.05 g and 3.0 cm).

### **Mud Crab *S. serrata* culture using formulated diet in brackishwater ponds**

*S. serrata* juveniles were stocked in pond at 0.3 crab/m<sup>2</sup> and fed fish 100% or 50% fish + 50% formulated diet. Specific growth rate (SGR) of crabs fed fish alone (3.71 g/day) was higher than those fed fish and formulated diet (0.74 g/day).

A separate run is being conducted using four 200 m<sup>2</sup> pond compartments to compare the performance of mud crabs fed fish 100% (T1) or 30% fish + 70% formulated diet (T2). Specific growth rate of crabs in T1 (3.86 g/day) was higher than those in T2 (4.1 g/day). The crabs in both runs will be grown until marketable size ( $\geq 400$  g BW).

### **Grow-out production of mud crab in pond and mangrove pens at Dumangas Brackishwater Substation**

*S. serrata* juveniles were stocked in pond and mangrove pen at 5000/ha. After 273 days, crabs in mangroves attained an average weight gain/day of 0.74 g. Survival rate was 10%. Crabs reared in ponds attained an average 1.81 g weight gain/day with a survival rate of 35% after 123 days.

In another run, *S. serrata* juveniles (5.0 g) were stocked in 2 mangrove pens. Crabs were fed fish by-catch daily. After 104 days crabs had 127 g average body weight and 1.17 g weight gain/day in one pen while 81.8 g body weight and 0.74 g weight gain/day in another pen.

### **Enhancing adoption of mud crab production technologies in Northern Samar**

This newly approved study will be conducted in 4 municipalities in Northern Samar. The project covers the following aspects:

*Capacity building.* This involves lectures and demonstrations

*Refinement of mud crab culture practices.* Provision of technical assistance for one full cycle on nursery, grow-out and fattening management, and feed formulation

*Stock assessment and policy.* This is a research component of the project. The seasonal trends in relative abundance of mud crab by size, sex, volume, stage of maturity, and condition of habitat will be monitored monthly for 2 years in 2 sites (mangroves in enclosed and open bays/estuaries) where crabs are commonly collected. Information will serve as a basis to formulate policies that govern crablet collection.

*Monitoring and Evaluation.* Assessment of improved practices and the impact on income and livelihood of the farmer beneficiaries

*Marketing.* Another research component of the project. A baseline survey will be conducted in various municipalities for those engaged in gathering, culturing and marketing of mud crabs.

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

##### 4.1. Planning of the Project Activities

Shrimps:

Project/Activity Title	Duration	Remarks
Enabling aquatic animal health capacity through geographic information system GIS	2007-2008	on-going study
Domestication of indigenous shrimp species ( <i>P. monodon</i> and <i>P. indicus/P. merguensis</i> ) broodstock A. Genetic characterization B. Husbandry	2007-2011	on-going study
Refinement of techniques	2007-2008	on-going study
Adoption of environment-friendly techniques and nutritionally efficient diets in aquaculture systems	2007-2008	on-going study
Studies on the nutritional quality assessment of feeds and feedstuffs and their effects on growth, health conditions, immune response, aquaculture production, and environmental degradation of marine invertebrates commonly cultured in the Philippines: New aquaculture technology for various penaeid species	2007-	newly approved study
Revision of broodstock management and hatchery manual; preparation of flyers to identify different white shrimp species	2008	

Mud Crabs:

Project/Activity Title	Duration	Remarks
Domestication of mud crab a. Genetic characterization b. Husbandry	2007-2011	on-going study
Formulation of diets for nursery, grow-out and fattening phases	2007-2009	on-going study
Strategies to reduce cannibalism	2007-2008	on-going study
Verification of nursery technology	2007-2008	on-going study
Stock assessment and marketing of mud crabs in Northern Samar – under the ‘Enhancing adoption of mud crab production technologies in Northern Samar’ project	2007-2009	newly approved study
Revision of hatchery manual; preparation of nursery manual and flyer for the identification of different mud crab species	2008	

##### 4.2. Expected Outcomes

Mud Crabs:

- Technology for producing captive broodstock of indigenous shrimp species and mud crabs
- Improved reproductive performance of captive broodstock and higher survival of shrimp and mud crab seeds
- Economically viable hatchery technology
- Technology for use of environment-friendly and nutritionally efficient diets in aquaculture systems
- Policy recommendations on the conservation and management of wild stocks
- Training courses and manuals for the captive broodstock production

## PROGRAM DOCUMENT

**Program Category:** Departmental Program  
**Program Title:** Marine Fish Program  
**Responsible Department:** Aquaculture Program  
**Duration of Program:** 2006-2009

### 1. INTRODUCTION

The Marine Fish Program was established to continually improve the technologies for broodstock management, seed production, nursery, and grow-out culture of commercially important marine fishes such as groupers (*Epinephelus coioides* and *E. fuscoguttatus*), the Asian sea bass (*Lates calcarifer*), mangrove red snapper (*Lutjanus argentimaculatus*), rabbitfish (*Siganus guttatus*) and milkfish (*Chanos chanos*). The development of breeding and seed production technologies for pompano (*Trachinotus blochii*) has been added to the program for this year.

### 2. PROGRAM

#### 2.1. Objectives

The objectives are to: (a) improve the technologies for broodstock management, seed production, nursery, and grow-out culture of marine fishes such as groupers (*Epinephelus coioides* and *E. fuscoguttatus*), the Asian sea bass (*Lates calcarifer*), mangrove red snapper (*Lutjanus argentimaculatus*), rabbitfish (*Siganus guttatus*) and milkfish (*Chanos chanos*); and (b) develop breeding and seed production technologies for pompano (*Trachinotus blochii*).

#### 2.2. Program Description

The program in 2007 comprises 20 studies that fall under Research and Development and Technology Verification and Dissemination. They span the various stages in culture involving, broodstock, seed production, nursery, and grow-out culture of marine fishes. Some projects involve the production of marine fishes in brackish water ponds and in floating net cages. The studies are done in laboratory, broodstock, and hatchery/nursery facilities at the Tigbauan Main Station, brackish water ponds in Dumangas Brackishwater Station, and in floating net cages at the Igang Marine Station.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

#### **Development of strategies to extend the spawning season of Asian sea bass (*L. calcarifer*) in captivity.**

The study is ongoing with 5females/11males. The program needs more female broodstock.

#### **Studies on the seed production techniques of milkfish and rabbit fish.**

Heavy use of milkfish larval feed at the Integrated Broodstock and Hatchery facility. Use of larval feed starting on day 8 is now a standard protocol during larval rearing of milkfish and rabbit fish. Newly installed recirculating system has improved water quality and increased spawning frequency in milkfish.

**Identification of molecular markers for egg quality in cultured marine species.**

Primers for IGF-II and GH are being tested to be able to quantify the expression of IGF-II and GH mRNA by real time PCR.

**Reproductive biology of pompano, *Trachinotus blochii***

Maturing gametes have been detected in adult fish but no spontaneous spawning has been observed. Induced spawning will be tried next.

**Use of PUFA-rich thraustochytrids as enrichment diets for live foods (rotifers and *Artemia*) in the larviculture of the sea bass, *L. calcarifer*.**

Fatty acid analysis of Schyzochytrium strain of thraustochytrids from Leyte showed high levels of PUFA of which 34% was DHA, 7% was EPA, and 1% was ARA.

**Assessment of the potential of mysid shrimps (Crustacea: Mysidacea) as live food in marine fish culture 2: Nutritional evaluation of mysid shrimps.**

Proximate analysis showed high crude protein levels in wild mysids. Fatty acid analysis also showed high levels of EPA and DHA in wild mysids.

**Improvement of the nutritional value of locally available feed resources for practical aquatic feeds by submerged fermentation and solid substrate fermentation using milkfish gut bacteria and/or selected fungi.**

*Bacillus* sp and *Lactobacillus* sp are among the non-pathogenic microorganisms present in milkfish anterior and mid intestine that could be used in fermentation of feed ingredients. Positive identification is ongoing.

**Evaluation of nutritional factors and microbial derivatives as immunostimulants in grouper, *E. fuscoguttatus*. Influence of environmental stress on innate immunity and resistance to bacteria in grouper fed various immunostimulants.**

In trials involving unstressed or stressed (with hypoxic stress, i. e., aeration removed for 3-4 h for 3 consecutive days) fish and challenged with an intraperitoneal injection of a *Vibrio* isolate ( $10^8$  cfu/ml), mortality was nil in non-hypoxic fish while, in hypoxic fish, survival was greater in fish fed diets supplemented with immunostimulant (onion, ginger,  $\beta$ -glucan, or vitamin C) compared with fish fed unsupplemented diet (control). Data suggest that immunostimulants seem to protect stressed fish from *Vibrio* infection. Analysis of in vitro immune parameters is ongoing.

**Verification studies on the seed production techniques of high value marine fish species such as grouper, red snapper, and sea bass.**

New larval feed formulation for marine fish was easily accepted by larvae starting at day 15. Grouper can be weaned to artificial diet at day 45 and sea bass at day 21.

**Improvement of cage nursery rearing techniques for sea bass (*L. calcarifer*), grouper (*Epinephelus spp*) and mangrove red snapper (*L. argentimaculatus*) in earthen ponds.**

Zooplankton was cultured in ponds for food of fry (grouper/ sea bass); dominant genera observed were *Acartia*, *Calanus*, *Oithona*, and *Pseudodiaptomus*. Studies of the population dynamics of zooplankton in ponds will be undertaken.



### **Milkfish fingerling production in ponds.**

Two trials were already done. In trial 1, low survival and high incidence of abnormalities in fry were observed probably due to fry coming from off-season spawning of milkfish. In trial 2, higher than 90% survival with low incidence of abnormalities of fry was observed from fry coming from early season spawning.

### **Effect of molluscicide and pesticide on snail population in milkfish grow-out production pond.**

The molluscicide metaldehyde (75% META) was effective in treating moderate and heavy snail infestation in milkfish ponds. Initial trials showed that this formulation was better than other treatments including tobacco dust, ammonium sulfate/lime combination, and Terminator (containing saponin as active component), nicotinamine sulfate, or handpicking (control) at recommended rates and application modes. However, if costs are considered Terminator, nicotinamine sulfate, or ammonium sulfate/lime appears to be economically viable alternatives.

### **Verification of grouper and snapper diets in grow-out cages in pond.**

Initial results showed growth and survival of fish fed SEAFDEC diet compared well or even better than those of fish fed commercial grouper/snapper diet. Lower survival of grouper compared with snapper was due to cannibalism.

### **Verification of sea bass grow-out diet in ponds.**

Growth and survival of sea bass on SEAFDEC diet compared well with those fed commercial diet. Low survival (70%) of sea bass was due to cannibalism. In 2008, phased diets (starter/ grower/ finisher) will be tested.

### **Production of marine fishes in brackish water ponds. 1. Nursery cage fingerling production of sea bass, grouper, and mangrove red snapper in brackish water ponds.**

Sea bass fry grew better when fed zooplankton than when fed trash fish. Grouper survival was low (3-8%) due to cannibalism.

### **Production of marine fishes in brackish water ponds. 2. Grow-out cage culture of sea bass, snapper, and siganid in pond.**

Sea bass are now being cultured using SEAFDEC diet in the production ponds. Bigger fish (larger than 300 g) are being reserved for ABOT Negosyo's sea bass festival. Smaller fish (less than 70 g) will be moved to floating net cages at IMS.

### **Production of marine fishes in brackish water ponds. 3. Grow-out culture of grouper, *Epinephelus* spp.**

Groupers fed SEAFDEC diet are also being cultured in production ponds. Using bigger fish at initial stocking (20 g) market size fish can be obtained at DOC 260 with good survival rates. About 1000 pc market size fish (>400 g) have already been sold.

### **Use of SEAFDEC formulated diet for milkfish cultured in marine cages (Verification study).**

Trials for milkfish grow-out feed designed for milkfish culture in sea cages are ongoing. The diet is being compared with commercial milkfish feed.

### **White cowpea as alternative source of protein for grouper, *E. coioides*.**

White cowpea seems to be a promising alternative plant protein source in grouper diets in preliminary trials in floating net cages. It compares well with a SEAFDEC diet that contains more fish meal.

### **Culture of high value finfish in floating net cages.**

Grouper grown in sea cages using SEAFDEC diet for 120 days attained 260 g (average body weight), specific growth rate of 1.1, and food conversion ratio of 2.3. In 2008, phased diets (starter/ grower/ finisher) will also be tried.

## **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008**

### **4.1. Planning of the Project Activities**

All present studies will continue in 2008. The major proposed activity in the grow-out culture of milkfish, sea bass, grouper, and snapper will be the testing of phased diets (starter, grower, and finisher) to improve the FCR of the present formulated diets. Boosting milkfish broodstock diets with antioxidant vitamins and other nutrients (perhaps HUFAs) for off-season spawning will also be done. Various means to reduce the cost of larval diets for marine fishes will also be pursued. On snail control, the integrated pest management approach to reduce the cost of treating infested milkfish ponds should be tried. The dynamics of zooplankton populations in brackish water ponds for nursery rearing of marine fishes will also be studied in greater depth.

### **4.2. Expected Outcomes**

The proposed activities on larval and grow-out diets will improve the performance of SEAFDEC formulated diets for larvae, fry, and grow-out and improve the economics of feeding using these diets. Fortifying the milkfish broodstock diet will improve the quality of fry from off-season spawning and also that of fry obtained during the spawning season. Integrated pest management in milkfish ponds will be effective in controlling the snail infestation of the ponds and improve productivity. Basic studies in population dynamics of zooplankton in the ponds will better our understanding of the succession of natural food in the nursery pond and help us design ways to improve nursery culture of marine fishes.

## PROGRAM DOCUMENT

**Program Category:** Departmental Program

**Program Title:** Small-Holder Freshwater Aquaculture Program

**Responsible Department:** Aquaculture Department

**Duration of Program:** 2006-2010

### 1. INTRODUCTION

Freshwater fish production through aquaculture dominates farmed finfish production in many Asian countries including the Philippines. There is an increasing demand for food fish from freshwater aquaculture. Sustainable intensification of food production in aquaculture, particularly in marginalized rural communities is a key activity to improve self-sufficiency of these communities.

The focus of the Small-Holder Freshwater Aquaculture Program of AQD is in-line with the thrust of the SEAFDEC Program on Sustainable Fisheries for Food Security in the ASEAN Region

### 2. PROGRAM

#### 2.1. Objectives

The program objectives are to: (1) refine seed production methods of selected freshwater commodities (e.g. giant freshwater prawn, catfish, carp, and tilapia); (2) develop grow-out production of giant freshwater prawn and catfish in lakes using cages; (3) improve production of both the hatchery and grow-out of selected freshwater commodities; (4) assess the social and economic impact of aquaculture in Laguna de Bay region; (5) verify and commercialize the freshwater aquaculture technologies; and (6) disseminate verified freshwater aquaculture technologies through the publication of manuals, flyers and the conduct of seminars, workshops and hands on-training.

#### 2.2. Program Description

The Program components are the: (i) research, (ii) technology verification and commercialization, and (iii) information dissemination. Some of the activities are in parallel with other existing program of AQD - the Promotion of Sustainable Aquaculture in the ASEAN Region under the Sub-Program Freshwater Aquaculture of Indigenous Species.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

#### **Growth and survival of Asian catfish fry reared in net cages with and without supplemental feeding in Laguna de Bay, Philippines**

The growth of the native catfish *Clarias macrocephalus* fry after 6 weeks of rearing in hapa net cages was generally higher in fish fed artificial diet than in fish exclusively fed with natural food from the lake. The specific growth rate and weight gain of the fry stocked at 100pcs/cage and 200pcs/cage did not differ significantly. However, specific growth rate and weight gain were highest in those fry stocked at 100pcs/cage and in those stocked at 200pcs/cage. Survival rate was highest in fry stocked at 100pcs/cage without an artificial diet but did not differ significantly from the survival rates of fry in other treatments.

Fish that fed exclusively on natural food showed insects, phyto and zooplankton as well as plant fiber material with *Chironomid* larvae as major food component in the gut content. The abundance of *Chironomid* larvae and artificial diet in the culture environment as reflected in the gut content of the fry in both particular treatments suggests that catfish fry voluntarily consumed major food types immediately available for utilization.

Result of the feeding trial with catfish fry reared at 100pcs/cage at various feed levels indicated that growth and survival of fish after 6 weeks of rearing were not significantly different in all treatments.

**Refinement of broodstock and hatchery management methods for the commercial production of freshwater prawn *Macrobrachium rosenbergii* seedstock I. Production of *M. rosenbergii* larvae tolerant to reduced salinities**

Postlarvae which metamorphosed from larvae reared in 12 ppt and 6 ppt were stocked in tanks and lake-based net-cages for 5 months culture in early 2007. Results suggest that reducing the hatchery/nursery salinity does not negatively affect the performance traits (growth and survival) of the freshwater prawn. A 5-month growth experiment in tanks and cages was again set up to determine the growth and survival of the selected and control prawns. The F1 postlarvae from the 12ppt group serves as control while the F1 postlarvae from the 6ppt group serves as the selected stock. Heritability values after the first round of selection shall be determined at the end of the 5-month rearing period.

**Farming of *Macrobrachium rosenbergii* in modular cages in Laguna de Bay**

Experiments are in-progress to determine the effect of horizontally oriented shelters on growth and survival. Generally better growth, survival, daily growth rate and specific growth rate were observed in cages provided with net shelters but the differences between were not statistically significant with  $P>0.05$ .

**Refinement of broodstock and nursery technology for the commercial production of bighead carp *Aristichthys nobilis* (Richardson) fingerlings in cages in Laguna de Bay. 1. Reproductive performance and fry production of bighead carp on different feeding regime**

The effects of three feeding regimes (3 months feeding before spawning, 2 months feeding before spawning and 1 month feeding before spawning) on reproductive performance of bighead carp in cages were evaluated. Among those induced to spawn, females in treatment 3 (one month feeding before spawning) had significantly higher fertilization rate and hatching rate. However, the total weight of eggs/spawning was significantly higher for bighead carp broodstock in treatment 1 (3 months feeding before spawning). The number of fry produced by the broodstock in treatment 4 (no feeding) was lower than the other three treatments. Growth performance evaluation of fry obtained from the different treatments is in progress.

**Economic impacts of aquaculture development in Laguna Lake**

Results of the survey have been analyzed. Additional information and secondary data from various government institutions and agencies were also gathered. Initial write ups are on-going and report will be submitted by the 4th quarter of this year.

**Integrated fisheries resource management (Rinconada Lakes, Philippines and NSW Australia): Aquaculture and Water Quality Component**

Experiments were conducted to evaluate the use of various stocking densities (5, 10 and 15 pcs/m<sup>2</sup>) and with or without artificial feed for rearing Nile tilapia in cages in Lake Bato and Lake Buhi, in collaboration with local fish farmers. Tilapia stocked in cooperated cages in Lake

Bato had an average body weight of 180 to 200 grams after 4 months for those given feed, regardless of stocking density. While those not given any formulated feed and relied solely on natural food had average body weight of 100 g. Water quality in Lake Bato also improved with the onset of the rainy season.

**Genetic characterization of commercially important Philippine stocks of freshwater prawn, *Macrobrachium* sp., using DNA markers (Under GOJ- Promotion of Sustainable Aquaculture in the ASEAN Region)**

Methods to extract DNA and PCR-amplify mitochondrial DNA cytochrome oxidase I (COI) from wild and hatchery samples of *M. rosenbergii* have been optimized. Processing of samples for genetic variability analysis is 75% completed. Preliminary results show distinct genetic differences between hatchery and wild stocks based on restriction morphs obtained after digestion with restriction enzymes: HaeIII, RsaI, MspI, EcoRI and Mbo.

Conditions for mtDNA sequencing using primers flanking the mtDNA COI region are now developed and have been optimized. Thus far, mt DNA COI from one hatchery stock and four wild stocks have been sequenced. The wild stocks Leganes and Pampanga are taxonomically *M. rosenbergii rosenbergii* while the Zambales stock's identity has yet to be confirmed as either *M. rosenbergii dacqueti* or an interspecific hybrid based on the comparison of the sequence analysis. Work on mtDNA sequencing using representative samples from each stock shall be continued with the sequencing of *M. mamillodactylus* samples from Mindanao.

**Morphometric characterization and performance evaluation of *Macrobrachium rosenbergii* stocks and closely related species in found in the Philippines I. Collection, identification and validation of *Macrobrachium* samples: II. Performance evaluation (Reproductive efficiency) Under GOJ- Promotion of Sustainable Aquaculture in the ASEAN Region**

Collection, identification and validation of *Macrobrachium* samples. Prawn samples from several sites in Luzon and Mindanao were obtained and identities of some of the samples were determined and validated. To date, 14 *Macrobrachium* species (*M. australe*, *M. equidens*, *M. esculentum*, *M. horstii*, *M. idae*, *M. jaroense*, *M. lanceifrons*, *M. lar*, *M. latidactylus*, *M. lepidactyloides*, *M. mamillodactylus*, *M. rosenbergii rosenbergii*, *M. rosenbergii dacqueti*, *M. weberi*) found in almost all Philippine regions (except Region VII) have been identified.

Performance evaluation (Reproductive efficiency). The reproductive efficiency of *Macrobrachium rosenbergii* hatchery (BFAR) and wild (Calumpit) stock given various types of feed and feeding rates (low protein at 2% of the prawn biomass, high protein at 2% of prawn biomass and low protein given *ad libitum*) was evaluated. Results showed differences in the reproductive efficiency of the two stocks especially in terms of the average number of hatchlings per g. female body weight. Hatchery stocks fed low protein fish feed *ad libitum* had the highest number of hatchlings at 648/g body weight followed by those fed fish feed at 2% prawn biomass (583/g) and the high protein prawn feed pellets (578/g). On the other hand, wild stocks fed low protein fish feed at 2% prawn biomass had the most number of hatchlings per g female body weight (823/g), followed by low protein fishfeed administered *ad libitum* (741/g) and finally high protein prawn feed (609/g).

**Morphometric characterization and performance evaluation of different *Macrobrachium* strains and other commercially important freshwater prawns in the Philippines. III. Performance of different strains of *Macrobrachium rosenbergii* in grow-out culture in lake-based cages (Under GOJ- Promotion of Sustainable Aquaculture in the ASEAN Region)**

Post larvae of *M. rosenbergii* obtained from broodstock from Calumpit (Bulacan) reared in cages in the lake and given various feed types (shrimp feed, tilapia feed, catfish feed); mesh size

of cages (hapa vs. b-net); and shelter (with or without) were evaluated. After two months of culture in the net cages, results showed that feed type, and presence or absence of net shelters had no significant effect on growth and survival of *M. rosenbergii*. By the sixth month of culture, results showed that mesh size affected survival, with higher rates observed in those reared in hapa net (75%) compared with those in b-net cages (60%). Significantly larger prawns were also observed in the hapa cages (13.2 g mean weight) compared to those in b-net cages (10.5 g). The number and weight of blue-clawed males (BC) were also affected by mesh size with bigger culled out BC in the hapa cages (63 pcs vs 20 pcs). The mean weight of BC was not affected by mesh size. No significant effect on growth and survival as well as the number and weight of BC were observed with feed type and presence or absence of shelter.

#### **Hatchery seed production of the native catfish *Clarias macrocephalus***

The last spawning trial conducted in May 2007 produced more than 45,000 fry (day-4). Fry were further reared to post-fry and later sold to private growers or used in collaborative projects on nursery and grow-out. A total of 19,700 pcs fry were sold.

#### **Refinement of broodstock and hatchery management methods for the commercial production of freshwater prawn *Macrobrachium rosenbergii* seedstock: Bioeconomics of freshwater prawn hatchery production in different larval rearing system.**

Rearing of freshwater prawn *Macrobrachium rosenbergii* larvae in two culture systems (green water and clear water) using 100 liters tanks and 1 ton capacity tank was conducted. Based on the results of the second trial, larvae reared in clear water had an average survival of 31.35 % and it took 33 days to reach post larval stage, while larvae reared in green water had an average survival of 34.1 % and it took 28 days to reach post larval stage. In terms of post-larvae produced, the number of prawn larvae reared in green water was higher than that of prawn larvae reared in clear water..

#### **Improvement of fillet yield in Nile tilapia (*Oreochromis spp*) through farm-based mass selection and interspecific hybridization**

Second generation broodstocks selected for improved fillet yield have spawned. F<sub>3</sub> fingerlings are now being reared and monitored for growth in terms of improved body girth/depth (potential indicators for increased fillet yield). Results will be used as basis for making a decision on whether selection for increased fillet yield is a heritable trait.

#### **ABOT-AquaNegosyo**

The Binangonan Freshwater Station staff have rendered services to the 4 client entrepreneurs/fish farmers based in Luzon. The activities were holding discussion sessions with clients, site assessment, inventory of status of stocks, etc.

#### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

##### 4.1. Planning for the project Activities

Project/Activity Title	Duration	Remarks
<b>Research</b>		
Refinement of broodstock and hatchery management methods for the commercial production of freshwater prawn <i>Macrobrachium rosenbergii</i> seedstock I. Production of <i>M. rosenbergii</i> larvae tolerant to reduced salinities (Nr-04-C2006B)	24 months	Continuing study
Refinement of broodstock and nursery technology for the commercial production of bighead carp <i>Aristichthys nobilis</i> (Richardson) fingerlings in cages in Laguna de Bay. 1. Reproductive performance and fry production of bighead carp on different feeding regime (Nr-06-F2006B)	24 months	Continuing study
Integrated fisheries resource management (Rinconada Lakes, Philippines and NSW Australia): Aquaculture and Water Quality Component	28 months	Continuing study Under ACIAR funding
Genetic characterization of commercially important Philippine stocks of freshwater prawn, <i>Macrobrachium</i> sp., using DNA markers (Br-01-C2006B)	12 months	Continuing Under GOJ- Promotion of Sustainable Aquaculture in the ASEAN Region
Alternative diets for improved reproductive performance of commercially important <i>Macrobrachium</i> sp.	24 months	New study
Domestication and genetic stock evaluation of the indigenous giant freshwater prawn subspecies <i>Macrobrachium rosenbergii rosenbergii</i> and other commercially important <i>Macrobrachium</i> species	36 months	New For possible inclusion under the GOJ Program on Promotion of Sustainable Aquaculture in the ASEAN Region to be proposed in mid 2008 or after completion of FW prawn DNA marker study
Evaluation of the culture potential of <i>P. vannamei</i> in freshwater	24 months	New
Grow-out culture of Asian catfish <i>Clarias macrocephalus</i> (Gunther) in net cages in Laguna de Bay, Philippines	24 months	New
Fattening of the silvery theraponid, <i>Leiopotherapon plumbeus</i>	24 months	New
Evaluation of cladoceran, <i>Echinesca</i> sp. As alternative live feed in the hatchery production of some commercially important freshwater shrimp species	24 months	New
Viability of microalgal cells immobilized in various matrices under different environmental conditions	12 months	New Study; proposed in 2006 but was not acted on
<b>Technology Verification and Commercialization</b>		
Hatchery seed production of the native catfish <i>Clarias macrocephalus</i> (5500-T-TV-CF106T)	24 months	Continuing study

Improvement of fillet yield in Nile tilapia ( <i>Oreochromis</i> spp) through farm-based mass selection and interspecific hybridization (Br-02-F2006B/5303-T-TV-T0107B)	12 months	Continuing study
Refinement of broodstock and hatchery management methods for the commercial production of freshwater prawn <i>Macrobrachium rosenbergii</i> seedstock II. Bioeconomics of freshwater prawn hatchery production in different larval rearing system. (Nr-05-C2006B)	12 months	Continuing study
Advanced fingerling production of Nile tilapia	12 months	New
ABOT AquaNegosyo client service		On-going project
<b>Training and Information Dissemination</b>		
Special Training on FW Prawn hatchery and grow-out operations (possibly for interested Laguna LGU cooperators under the ICD-SA program)	5 days	BFS Training Coordinator/BFS staff For possible inclusion under the GOJ Program on Promotion of Sustainable Aquaculture in the ASEAN Region
Aquaculture Training Modules on selected freshwater species	5 days	BFS Training Coordinator/BFS staff Year-round course offering, 5-day modules on various aspects of freshwater aquaculture for paying participants
Customized on-site training	2-3 days	BFS Training Coordinator/BFS staff Training conducted on-site with syllabus specially designed to the client needs
FW Aqua Training Course	4 weeks	BFS Training Coordinator/BFS staff Regular course offering, 3-4 week course
Catfish nursery in lake-based cages		Manual write-up
Revision of bighead carp manual to include other commercially important carp species		Manual revision
Manual on Giant Freshwater Prawn Cage Culture		Manual write-up
Manual on Hatchery and Nursery of Giant Freshwater Prawn		Manual write-up

**Alternative diets for improved reproductive performance of commercially important *Macrobrachium* sp.**

Alternative feeds for *Macrobrachium* to improve reproductive performance will be tested. Four alternative feeds will be given to broodstock (formulated diet with earthworm, fresh mussel, or fresh squid as protein source, and commercial feed available for shrimps). Reproductive performance will be evaluated in terms of survival, days to reach post larvae and PL production.



**Domestication and genetic stock evaluation of the indigenous giant freshwater prawn subspecies *Macrobrachium rosenbergii rosenbergii*. (A) Assessment of breeding and reproductive performance (B) Determination of larval rearing and seed production requirements, and (C) Evaluation of performance in grow-out.**

Two stocks (Leganes and Sorsogon) of the native freshwater prawn subspecies, *M. rosenbergii rosenbergii* shall be procured and domesticated. Growth, reproduction and other commercially important traits of the two stocks shall be compared to determine genetic stock differences and to identify the better performing stock which can be promoted for commercial aquaculture.

**Evaluation of the culture potential of *Penaeus vannamei* in freshwater**

The study will determine production of *Penaeus vannamei* in non-amended freshwater environment. The study will involve culture of freshwater acclimated *P. vannamei* in ponds, tanks and cages. The later part of the study will assess of the production achieved in this culture environment is economically viable. Post larvae of *P. vannamei* to be used in this study will be obtained from NFRDI which produces SPF and SPR strains.

**Grow-out culture of Asian catfish *Clarias macrocephalus* (Gunther) in net cages in Laguna de Bay, Philippines**

The study will assess the economic viability of farming Asian catfish *Clarias macrocephalus* (Gunther) in net cages in Laguna de Bay, Philippines. The optimum stocking rates and feed ration for catfish juveniles reared in net cages will be evaluated after which growth and yield will then be assessed employing optimal stocking rates and feed ration identified from the previous feeding trials.

**Fattening of the silvery theraponid, *Leiopotherapon plumbeus***

The silvery theraponid, *Leiopotherapon plumbeus* is an indigenous species in Laguna de Bay. Current catch of the species is limited to small sizes (6 cm length) from the Lake. There is a market for larger sized *L. plumbeus* and the technology, once established can be easily picked up by marginal fisherfolk in the lakeshore towns of Laguna de Bay.

**Evaluation of cladoceran, *Echinesca* sp. as alternative live food in the hatchery production of some commercially important freshwater shrimp species**

The study will assess the efficiency of cladoceran, *Echinesca* sp. as alternative live food in the larval production of *Macrobrachium rosenbergii* and *Penaeus vannamei*. *Echinesca* sp. will be offered at different feeding regimes in comparison with *Artemia* nauplii.

**Viability of microalgal cells immobilized in various matrices under different environmental conditions**

The study aims to establish a protocol for low-cost, long-term preservation of viable freshwater microalgae using various matrices under different environmental conditions. Cell immobilization of *Chlorella ellipsoidea*, *Scenedesmus bijugatus* and *Spirulina platensis* will be conducted using sodium alginate, k-carrageenan and gelatin gel after which the cultures will be stored for various time period and exposed to different temperatures and light intensities. The viability of microalgal cells will be assessed.

## **Advanced fingerling production of Nile tilapia**

This project will verify production systems for advanced fingerlings for Nile tilapia to address market demand for larger seedstock.

### **4.2. Envisaged Outcomes of the Proposed Projects/Activities**

#### Giant Freshwater Prawn

- Improved seed production of giant freshwater prawn
- High survival of larvae
- Established protocols for improved survival of larvae to PL
- Improved survival of PL in the nursery
- Appropriate nursery system for production of PL for stocking identified
- Proof of viability of developed hatchery and nursery systems
- Genetic improvement of giant freshwater prawn for improved production traits
- Local stocks/species identified
- Domesticated wild stocks
- Defined growth performance of domesticated native stocks
- Production of larvae tolerant to low salinities
- Genetically improved strains
- Verified technology for cage culture of giant freshwater prawn
- Refined broodstock, hatchery and nursery techniques ready for technology packaging
- Refined grow-out technology for cage and pond culture
- Production of genetically improved and/or native strains

#### Adoption of technology for the seed production and grow-out of prawns

- Established partnership with private sector
- Established partnership with LGU's and NGO's

#### Nile tilapia

- Genetic improvement of Nile tilapia
- Farm-based selection method developed
- On-farm growth performance of genetically improved stock determined
- Generated technology for tilapia production
- Nile/red tilapia with improved carcass traits produced; selection scheme established
- Advanced fingerlings produced; technology for advanced fingerling production established

#### Catfish

- Develop appropriate nursery and grow-out technologies for lake-based culture
- High survival in the hatchery stage
- Improved survival of catfish in lake-based nursery cages
- Improved survival of catfish in grow-out in lake-based cages
- Technology for culture of catfish verified and demonstrated
- Refined nursery of catfish in lake-based facilities ready for packaging
- Refined grow-out of catfish in lake-based facilities ready for packaging

#### Bighead Carp

- Improved seed production of bighead carp
- Increased fertilization rate
- Increased re-maturation
- High survival rate of fry
- Established protocol for improved survival of fry to fingerling
- Improved survival of fry in nursery

- Appropriate nursery/ stocking density for production of fry-fingerling for stocking identified
- Bighead carp broodstock, hatchery and nursery techniques verified and refined
- Broodstock, hatchery and nursery techniques ready for technology packing refined

#### Pacific White Shrimp

- Culture of *P. vannamei* in freshwater systems and its economic viability evaluated.
- Proposed Training and Information Dissemination Activities
- Transfer of seed production and grow-out technology of freshwater commodities to fish farmers
- Training courses on hatchery, nursery, grow-out implemented
- Training for manpower for aquaculture industry
- Training courses designed for fishery educators
- Manuals on hatchery, nursery, grow-out published/revised to aid fish farmers

## PROGRAM DOCUMENT

**Program Category:** Departmental Program

**Program Title:** Seaweeds

**Responsible Department:** SEAFDEC Aquaculture Department

**Duration of Program:** 2006-2010

### 1. INTRODUCTION

The Philippines is the world's leading producer of the carrageenan-bearing seaweed, *Kappaphycus*, with a total production of 108,000 mt of dried seaweed in 2005. Other top producers include Indonesia (66,000 mt), Indochina (6,000 mt) and Africa and others (2,400 mt) (Pers. Comm., Balicuatro 2006). The steady growth of seaweed production of Indonesia and Indochina is replacing the Philippine share of the market by at least 5% annually (Pers. Comm., Balicuatro, 2006).

The Philippines produced a total of 1,338,597 mt fresh weight of seaweeds in 2005 (Pers. Comm., BAS 2006). Although there is a perceived annual increase in production, apparently, the productivity of a farmer is not increased. It would be far better if the measure of productivity is based on the expansion of productive areas with an accompanying use of high performing and superior cultivars. Nonetheless, such is not the case at present. The seaweed industry is also faced with basic problems like: (1) continued declining quality of carrageenan brought by declining quality of harvested crops caused by inferior cultivars (Pers. Comm., SIAP 1995, 2000, 2005), (2) unstable biomass production, (3) vulnerability to 'ice-ice' disease (Uyengco *et al* 1981, Largo *et al* 1995a & b) and harmful endophytes like *Polysiphonia* (Critchley *et al* 2004, Hurtado and Critchley 2006, Hurtado *et al* 2006), and (4) poor post-harvest management (Hurtado and Agbayani 2000).

Renewal of stocks could minimize the occurrence of diseases in *Kappaphycus*. Some techniques have been developed to renew seaweed stocks. Tissue culture was done in *Eucheuma* and young plants were outplanted (Dawes *et al* 1993 & 1994, Hurtado & Cheney 2003). The same technique was used in *Kappaphycus*, however, no mass production of young plants was made. Protoplasts of *Kappaphycus* were isolated (Salvador and Serrano 2005) and spores were released and germinated to sporelings (Corrales & Alias 1999). These techniques (tissue culture, protoplast fusion, and sporulation) are presently being used at SEAFDEC AQD to obtain 'new' and improved varieties of *Kappaphycus*. However, no work has been done, as yet, towards mass production of plantlets to obtain sufficient biomass for possible source of cultivars for large-scale outplanting. Hence, optimization of conditions for growth and biomass production under photobioreactor conditions, as well as in both land-based and sea-based nursery systems will be done.

### 2. PROGRAM

#### 2.1. Objectives

The program aims to: (i) identify 'new and improved' strains' of seaweeds, especially *Kappaphycus*, by the methods of tissue culture, sporulation, and protoplast; (ii) optimize growth performance and biomass production of the microplantlets; (iii) establish land-sea-based nurseries of the improved plantlets; (iv) establish a pilot commercial aquaculture using the improved strains; (v) develop and refine crop management protocols for the sustainability and higher productivity of the strain; and (vi) conduct a hands-on training on protocols of plantlet production and crop management

## 2.2. Program Description

The program focuses on activities that will lead to production of ‘new’ and improved varieties of *Kappaphycus* through tissue culture, sporulation, and protoplast fusion techniques. It also involves producing sufficient biomass from these techniques for possible source of cultivars for land-based and sea-based nursery systems, and consequently for pilot-scale outplanting.

## 3. PROGRESS OF ACTIVITIES

In the SEAFDEC Algal Production Laboratory, there are seven stages in the culture of seaweeds from spores/tissue/protoplast. The last stage is transferring the seaweeds from the laboratory to the sea. The following activities were undertaken during the period:

- a) Young plantlets of three varieties of *Kappaphycus* (kapilaran, vanguard and adik-adik) were developed from tissue culture using new culture media (ASL marine plant extract) at different concentrations (Stage 3).
- b) New shoots from in situ callus were developed from three varieties of *Kappaphycus* (kapilaran, vanguard and adik-adik) (Stage 3).
- c) *Kappaphycus* from spores (after 8 months) are grown in tanks (Stage 6).

## 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

All activities in year 2007 will be continued in year 2008.

### 4.1. Planning for the project activities

Project/Activity Title	Duration	Remarks
1. Propagation of <i>Kappaphycus</i> plantlets from callus-like structures by tissue culture	2006-2010	In progress
2. Seed production of <i>Kappaphycus</i> : Sporulation and protoplast isolation	2006-2010	30% completed

#### Propagation of *Kappaphycus* plantlets from callus-like structures by tissue culture:

Strains of *Kappaphycus* and *Eucheuma* will be collected from key production areas of the Philippines to serve as explants for the tissue culture and mutagenesis techniques. *In vitro* culture of the explants will be done until young plantlets regenerate are ready to be transferred in hatchery tanks for further growth. Land-sea based cultivar nursery bank will be established in order to mass produce the regenerants. Any accumulated volume of ‘new strains’ from the sea-based cultivar nursery bank will be dispersed to DA-BFAR for sea-based nursery bank and finally for distribution to farmers association.

#### Seed production of *Kappaphycus*: Sporulation and protoplast isolation:

Mature *Kappaphycus* will be collected from the wild and will be allowed to sporulate in the laboratory. This will be grown in the laboratory until enough biomass will be acquired and transferred to the grow-out. Protoplast will also be isolated in *Kappaphycus* to produce young plants.

#### 4.2. Expected Outcomes

- a) Adoption of developed *in-vitro* protocols for tissue culture, sporulation and protoplast fusion techniques of *Kappaphycus* strains;
- b) Regenerants of *Kappaphycus* strains from tissue culture and mutagenesis with improved growth characteristics and carrageenan properties;
- c) Young plants from sporelings of *Kappaphycus* strains with improved growth characteristics and carrageenan properties;
- d) Identified improved strains of *Kappaphycus* ;
- e) Developed protocols for the mass rearing of plantlets using photobioreactors, and land-based nurseries (tanks) or sea-based nurseries (cages or pens);
- f) Established satellite land-based nurseries of improved strains of *Kappaphycus* with collaborators.

## PROGRAM DOCUMENT

**Program Category:** Departmental Program  
**Program Title:** Aquatic Ecology  
**Responsible Department:** Aquaculture Program  
**Duration of Program:** 3 years (2007-2010)

### 1. INTRODUCTION

With the decreasing trend in fisheries production worldwide, aquaculture is being looked upon to feed the increasing demand for fishery products. However, the damaged and degraded state of most aquatic ecosystems worldwide, combined with public concerns about adding new sources of pollution from aquaculture requires the development of ecosystems approaches and sustainable operating procedures.

### 2. PROGRAM

#### 2.1. Objectives

The objectives of the Program are (a) to determine existing policies, institutions and ordinances to protect and ensure a sustainable aquaculture development in selected local government unit in Western Visayas, Philippines, (b) to recommend improvement in existing institutional arrangement in managing coastal resources in support of sustainable aquaculture in the selected local government units, (c) to demonstrate how environmental capacity can be determined in waters around Igang Marine Sub-station and other important aquaculture sites, and (d) to maintain good environmental condition of coastal areas and improve the condition of some degraded areas by growing seaweeds that absorb excess nutrients from the water.

#### 2.2. Program description

The program includes studies on (a) Institutional arrangement in local governance in selected municipalities in Western Visayas, Philippines, (b) Determination of environmental capacity of Igang Bay and other aquaculture sites, and (c) other ecological studies for sustainable aquaculture. Technologies developed from other SEAFDEC/AQD programs will be adapted in the studies under this program. Results of nutrition studies from marine fish and crustacean programs will be considered in estimating the environmental capacity of the sites.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

There are 2 studies under the Aquatic Ecology Program: 1) Environmental capacity of Humaron Cove, Igang, Guimaras and Bugang River, Pandan, Antique; and 2) The tangab fishery in Iloilo Strait: Operations, catch volume and species composition, economic importance and ecological impact.

1). The study site in Humaron Cove in Igang, Guimaras covers an area of 29 hectares including the areas occupied by SEAFDEC AQD's broodstock cages, production cages and mariculture park in the inner portion of the cove and the mariculture cages in the outer part, behind the small islands (see map). Nutrient concentration in Humaron Cove during the dry season ranged from zero to values above critical levels for phosphate (0-0.8251 mg/L), ammonia (0-0.1987 mg/L) and chl- $\alpha$  (0-0.0244 mg/L). TSS levels were generally high in all sampling points and highest during the month of May (162-200 mg/L). Phosphate reached above critical levels in sampling points near the broodstock and mariculture cages in May. Dissolved oxygen (DO) was still above the safe level of 3 mg/L. Salinity ranged from 32-36 and temperature from 26.4 to 31.7°C.

The total sampling area of Bugang River in Pandan, Antique is 8.8 hectares from the middle of the river down to the river mouth (see map). There were months when TSS, phosphate and chl- $\alpha$  were way above critical levels at certain sampling points at either low tide or high tide. However, ammonia level remained zero throughout the dry season. Highest nutrient concentrations were found in the inflow water – upstream from the fishponds located midstream, and from sites where cages were installed near downstream. PO<sub>4</sub> and chl- $\alpha$  were highest in inflow water from the fishpond. TSS reached very high levels downstream when the upstream water drains during low tide. DO ranged from 1.6 to 25.5 mg/L while temperature was 27.3 to 32.7°C. Salinity gradually decreased from upstream (5 ppt) to the sea (36 ppt).

Generally, High levels of water quality variables are not that persistent suggesting that the environmental capacity of the sites may not have been reached yet. Sampling during the rainy season is ongoing (until November 2007). The inputs of nutrients will also be quantified and data on flushing rates and depth of the sites will be confirmed. Several models will be used to predict environmental capacities of the two sites. Recommendations on the maximum fish biomass and number of aquaculture units that can operate in these areas will be based on these estimates of environmental capacities.

2). This study gathered qualitative and quantitative information to enable appropriate regulation of the tangab fishery. A tangab is a large fixed filter net many of which are set and operated along Iloilo Strait. A survey showed that tangab operations were concentrated and the catch landed at 4 sites in Iloilo Strait namely: Morobuan, Guimaras; Calumpang, Iloilo City; Arevalo, Iloilo City; and Atabayan, Tigbauan. The tangab fishery operates from dusk till dawn during periods of strong water currents (spring tides 7-9 days around new moon and 7-9 days around full moon), but weak winds and waves. The tangab nets are set up in groups of 4-12 with mouths held open by coconut trunks driven into the seabed. The 10 x 10 m tangab mouths with 20-30 m long nets (meshes from 10cm at front to 1mm at the cod end) filter everything from the water surface to the seabed. The tangab in Morobuan catches substantial amounts of high-value fishes, shrimps, and cephalopods. The trash fish includes large numbers of juvenile fishes and shrimps, which are dried for human consumption and for livestock feed or fish meal. The tangab in Atabayan targets the small but very abundant shrimp *Acetes*, other sergestids, and euphausiids for the ginamos and tinabal industry. The tangab in Arevalo and Calumpang catch enormous amounts of trash fish that the beach residents pick for edible species and sizes. The low-grade trash fish including pufferfishes, small crabs and spiny invertebrates are in small part dried as fish meal for livestock, but in large part sold as food for sea bass and groupers. About 200 species of fishes, crustaceans, mollusks and other invertebrates have been identified in the tangab catch at the four sites.

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

##### 4.1. Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1) Environmental capacity of Humaron Cove, Igang, Guimaras	3 years	Study will be expanded to include monitoring of sediment quality parameters. The effects of aquaculture activity on the status of coral reef health will also be looked into.
2) The tangab fishery in Iloilo Strait: Operations, catch volume and species composition, economic importance and ecological impact.	2 years	Other activities include setting up of tangab exhibit at Fishworld; conduct training workshop on the identification of larval and juvenile stages of fishes and other marine organisms preferably for BFAR personnel; conduct seminar workshop for tangab operators, buyers, beneficiaries, local government regulatory officers and other stakeholders on the economic importance and



		ecological impact of the tangab fishery; produce leaflet about the tangab fishery; and prepare policy recommendation(s) on regulation of tangab fishery
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#### 4.2. Expected Outcomes

Data for water quality parameters will be fitted into several models to predict environmental capacities of the two sites. Recommendations on the maximum fish biomass and number of aquaculture units that can operate in these areas will be based on these estimates of environmental capacities. The same concept or studies can be undertaken to assess environmental capacities of the different mariculture parks that have already been set up or will be set up in other parts of the country.

The tangab fishery study gathered qualitative and quantitative information to enable appropriate regulation of the tangab fishery.

**PROGRAMS OF ACTIVITIES UNDER ASEAN-SEAFDEC FISHERIES  
CONSULTATIVE GROUP FOR THE YEAR 2007-2008**

**I. Existing Programs**

<b>Programs under the ASEAN SEAFDEC FCG Mechanism</b>	<b>Lead Country</b>	<b>Lead Department</b>	<b>2007</b>	<b>2008</b>
1. Support to the Implementation of the Code of Conduct for Responsible Fisheries in ASEAN Region <sup>a</sup> <u>Component I: Mainstreaming Regional Guidelines</u> <u>Component II: Capacity Building for Implementation of the CCRF in the ASEAN Region</u>	Indonesia	Secretariat	X	X
2. Assistance of Capacity Building in the Region to Address International Trade Related Issues	Thailand	Secretariat	X	X
3. Promotion of Rights-based Fisheries and Co-management towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management	All Member Countries	TD	X	X <sup>b</sup>
4. Improvement of Fishery Statistics and Information for Planning and Management of Fisheries in the ASEAN Region	Thailand	SEC	X	X
5. Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)	Thailand	TD	X	X
6. Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement	Thailand	TD	X	- <sup>c</sup>
7. Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses	Thailand	TD	X	X
8. The Use of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region	Malaysia	MFRDMD	-	- <sup>d</sup>
9. Development of Integrated Inland Fisheries Management in ASEAN Countries	Malaysia	MFRDMD	-	- <sup>d</sup>
10. Development of Technologies and Human Capacity Building for Sustainable Aquaculture	Philippines	AQD	X	X
11. Quality Assurance Systems for Small and Medium-sized Fish Processing Establishments in ASEAN Member Countries	Singapore	MFRD	X	X
12. Utilization of Freshwater Fish in ASEAN Member Countries	Singapore	MFRD	-	- <sup>d</sup>
13. Good Laboratory Quality Management in ASEAN Member Countries	Singapore	MFRD	-	- <sup>d</sup>
14. Environmental Related Tasks in Southeast Asia (in collaboration with the Departments)	Malaysia	Secretariat	X	X

<sup>a</sup> The program in 2007 was previously referred to Regionalization of the Code of Conduct for Responsible Fisheries

<sup>b</sup> The program in 2007 was previously referred to Strengthening Small-scale Fisheries Management through the Promotion of Rights-based Fisheries and Co-management.'

<sup>c</sup> The program is deferred until funding available.

<sup>d</sup> The programs have been suspended and dropped in 2008 until funding available.

15. Establishment of Disease Surveillance System of Aquatic Animals	Philippines	AQD	X	X
16. Chemical and Drug Residues in Fish and Fish Products in Southeast Asia	Singapore	MFRD	X	X
17. Research and Development (R&D) of Stock Enhancement for Species under International Concerns	Philippines	AQD	X	X
18. Research for Stock Enhancement of Sea Turtles (in collaboration with TD)	Malaysia	MFRDMD	X	X
19. Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty	Thailand	TD	X	X
20. Support to Tsunami Rehabilitation of Affected Countries in the ASEAN Region	TBD <sup>e</sup>	Secretariat	X	X
21. Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2	All Member Countries	TD	X	X
22. Deep Sea Fisheries Resources Exploration in the Southeast Asia (in collaboration with MFRDMD)	TBD	TD	X	X
23. Tagging program for economically important pelagic species in the South China Sea and Andaman Sea (in collaboration with TD)	TBD	MFRDMD	X	X

**Remark:** Programs no. 3-13 formerly were under the Special 5-year Program

## II. Proposed New Programs for 2008

Program Title	Lead country	Lead Department
1. Promotion of "One Village, One Fisheries Products (FOVOP)" System to Improve the Livelihood for the Fisheries Communities in ASEAN Region (New)	TBD	Secretariat
2. Information Collection of Highly Migratory Species in Southeast Asia Waters (New)	TBD	TD
3. Development of Regional Database for Fishery Management (New)	TBD	TD

<sup>e</sup> TBD = To be determined by ASWGF

## **PROGRAM DOCUMENT**

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Regionalization of the Code of Conduct for Responsible Fisheries

Component II: Human Resource Development on the Support to the Implementation of the CCRF in the ASEAN region (financial supported by Sida)

**Lead Department:** Secretariat in collaboration with all Departments

**Total Duration:** 2007

### **1. INTRODUCTION**

Since the adoption of the Code of Conduct for Responsible Fisheries (CCRF) in 1995, SEAFDEC supports the implementation of the CCRF and upholds the general principles and standards provided therein. To fulfill this obligation and to introduce the CCRF in Southeast Asia, SEAFDEC, as a premier fisheries center in the region with a long-term commitment to sustainable development and management of the region's fisheries and coastal resources, has initiated a comprehensive program known as the Regionalization of the Code of Conduct for Responsible Fisheries.

### **2. PROGRAM**

#### **2.1 Objectives**

The main emphasis during 2007 is to maintain the momentum of the achievements under the SEAFDEC-Sida collaborative project, with the following objectives:

- 1) Promote continued and increased interest for regional and sub-regional cooperation;
- 2) Initiate and continue process on establishment of refugia;
- 3) Initiate the process to monitor and record fishing capacity;
- 4) Provide background information for habitat and fisheries management
- 5) Address fishing capacity through studies and consultation
- 6) Finalize a proposal and framework for continued cooperation with Sweden from 2008

#### **2.2 Program description**

The focus and activities during the year 2007 was built upon results achieved through the Swedish supported since 2003, and other activities, incorporating elements of the recommendations provided at the Regional Technical Consultation, Phuket Thailand in October 2006, while at the same time move towards the implementation of the activities under a new collaborative agreement between SEAFDEC and Sweden.

A general thrust in the process of implementation is to support trends among ASEAN and SEAFDEC Member Countries to come to agreement among the countries on matters of importance to fisheries management, such as fishing capacity, conflicts, fish resources conservation areas, etc. and the medium to long term perspective support the establishment of a regional fisheries management mechanism. Capacity building during 2007 for government staff at various levels and other were, primarily, organized by involvement in activities or learning-by-doing rather than formal training sessions.

The activities in 2007 focused on the Gulf of Thailand, the South China Sea and Sulu Sulawesi Seas were in the light of a priority of activities in the area of Andaman Sea and Malacca Strait planned for under post –tsunami related project. However, in addressing fishing capacity the whole region would be in focus. Continued co-ordination among regional,

international and national organizations was maintained during the year with a base in the ASEAN Fisheries Consultative Group framework.

### **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

The year 2007 is considered and proposed as the extension or bridging year, the activities were implemented under the following set of seven headlines: process to promote establishment of regional fisheries management body/mechanism; integration of fisheries into habitat management; incentive for environmental friendly fisheries/eco-labels; understand the size and structure of large-scale fisheries; systems to monitor and record coastal fisheries; local knowledge and safety at sea; and project management and coordination.

The activities were established with the aim to initiate /continue the promotion of:

- 1) A process supported to establish a regional fisheries management body/mechanism in Southeast Asia;
- 2) Capacity for the management of fisheries and important coastal fisheries (refugia) and the protection against natural hazards built up and improved in Cambodia, Vietnam and Thailand; and
- 3) Understanding provided on the size and structure of large-scale (or industrial) fisheries and capacity strengthened to monitor and record active fishing effort in coastal fisheries built up as a basis for development of coordinated plans for management action on fishing capacity among ASEAN-SEAFDEC Member Countries and implemented (large and small scale).

Major achievements and progress of works in 2007 can be highlighted as follow:

#### **Regional Fisheries Management Mechanism**

With the directives given to SEAFDEC through recommendations were provided to SEAFDEC Council, ASWGFi, and SOM-AMAF on the project results leading to the promotion of the integration of fisheries management into habitat management with a focus on trans-boundary areas (such as Gulf of Thailand, Andaman Sea, Sulu Sulawesi Seas, Mekong, etc.), this led to the project organization of an important event “Regional Technical Consultation and Workshop on the Concept and of the Establishment of an ASEAN Fisheries Development and Management Mechanism” held in Bangkok during 6 to 8 November 2007. It was recommended that SEAFDEC should continue to take a lead, together with Department of Fisheries Thailand on conceptual points for consideration to be identified together with the recommendations on scope and focus to be applied in the continued process. The results will be presented to ASEAN and ASWGFi.

#### **Habitat and Fisheries Management**

Development of criteria to determine the size of national, sub-regional and trans-boundary areas of the significance was made through meeting/consultation. The development of the criteria was recommended as follow:

- To build upon an aggregation of smaller management areas, which established for local fisheries or habitat management;
- To recognize the existing zoning schemes such as trawling free zones; and
- To take note of the seasonality in fishing and fish migration/spawning, etc.

Furthermore, the project organized “On-site training/workshop on the Integration of Fisheries Management into Habitat Management” in Koh Kong Province, Cambodia, from 6 to 9 August 2007. During the workshop, idea on larger management areas and boundaries was discussed. In principle, it was agreed upon and to be further followed up again through the process of development maps. After that, the project team has initiated the process, starting

with Cambodia and Thailand to collect information available on maps to get a summarized view on location and size of different management areas. Other follow up with working groups of UNEP/GEF/SCS project to collect information on status of important nursery grounds, spawning areas and coastal habitats in the area at least Koh Kong, Kampot, Trat was also carried out.

### **Incentive for sustainable fishing/eco-labels**

Preparation for pilot activities on eco-labels through organization of the meeting and participation of staff to relevant events was conducted. To build up the pilot activity, the project could come up with the three major candidates, including: crabs (mangrove) in Trat, Koh Kong and Kampot; mackerel and other species in Chumporn and Eastern Gulf of Thailand; and Prara/Prahok in Cambodia, Laos and Thailand.

Results in summary from the various events with respect to the role of government on eco-labelling in Southeast Asia are:

- Recommendation provided on the role of the government and the message is clear that there is a role for the government;
- Identified critical element is the certifying body and the role of the government in the establishment; and
- Certification scheme could be developed out of less “ambitious” schemes than the “third party” schemes, with the government playing important role.

### **Size and structure large-scale fisheries**

To review available information on the size and structure of large-scale fisheries, project staff participated in the series of events, including APFIC IUU Meeting in Phuket, and the “Regional Workshop to Support the Implementation of the Regional Plan of Action (RPOA) to Promote Responsible Fishing Practice including Combating IUU Fishing in the Region, in Bangkok. It was confirmed that there is not any reliable or aggregated information on the size and structure of large-scale fisheries – especially in the Southeast Asian region. It was found that the common objective and similar activity of SEAFDEC-Sida project are there in the RPOA. The agreement was made that the project should cooperate with RPOA on review of the large-scale fisheries.

### **Monitor and record coastal fisheries**

Based on the output from organization of the training/workshop in Koh Kong, it gave a good indication that the Community Fisheries in Cambodia could be involved with their area – outside their areas they could be of limited, or no, support. They also clearly stated problems with not having enough funds for monitoring. As mentioned above on the participation of the staff to RPOA IUU workshop, the inputs provided based on the experience from the project activities and an understanding developed in that SEAFDEC will cooperate in further developing RPOA IUU, and MCS.

See also *Appendix 1* on status and detail of the results achieved to date for SEAFDEC-Sida cooperation for extension, year 2007.

## **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008**

To promote the development of a regional fisheries management mechanism, and based on the result achieved at the consultation on the concept for establishment of regional fisheries management mechanism held in November 2007, it is expected that the scope and framework will be further developed during 2008 in dialogue with ASEAN Member Countries. As practical, this will include a small seminar in each of countries. Scope, framework and

timeline will be submitted to SEAFDEC Council, the ASWGFi and the ASEAN SOM-AMAF at official meetings for further endorsement and support to maintain the momentum that has been built so far.

In the process of building up awareness and national support, activities during 2007 with Swedish funding have included continued work with the integration of habitat management into fisheries management (esp. in Cambodia, Vietnam and border provinces of Thailand), work with processes to profile the large and small-scale fisheries and related social dimensions, SEAFDEC have provided inputs to work on Illegal, Unregulated and Unreported fishing (IUU), SEAFDEC have continued to explore ways to provide incentive for fishermen that fish in a responsible way (eco-labelling). Furthermore, SEAFDEC is with the Swedish support promoting the cooperation in trans-boundary water-bodies, during 2007 mainly Eastern Gulf of Thailand, while starting to explore options for Sulu-Sulawesi Seas and the Andaman Sea.

Continued emphasis has been given by the Project to secure solid cooperation with other regional organisations and projects. This is successfully done with APFIC/FAO, the UNEP-GEF South China Sea Project, the Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices, including Combating IUU Fishing in the Region, Mekong River Commission, UNEP-COBSEA, and the Wetlands Alliance

During 2008 there will be a continued push for the process to establish a Regional Fisheries Management Mechanism by ASEAN Ministers and in support of that SEAFDEC-Sida Project will with individual countries (esp. Cambodia) and trans-boundary regions give further emphasis to the promotion of integration of fisheries management into habitat management with a focus on trans-boundary areas such as the Gulf of Thailand, the Andaman Sea, the Sulu Sulawesi Seas, the Mekong, etc – while in the process ensure that a poverty focus is maintained and common understanding are reached between countries and institutions in each of the countries.

A number of events are planned for in the region that aim to support improve cooperation and mutual understanding among ASEAN-SEAFDEC Member Countries, thereby paving the way for the Regional Fisheries Management Mechanism. These events include:

- An ASEAN-SEAFDEC consultation on the ASEAN Roadmap for the Integration of the Fisheries Sector, 15 – 18 January 2008, in Bangkok.
- With support from the SEAFDEC-Sida Project the RPOA-IUU will be further developed during 2008 and jointly two events will be organised, one on Monitoring, Control and Surveillance (MCS) (Feb/March) and one on vessel registration (middle of the year). These events is also expected to support the process in establishing the RFMM
- Jointly with APFIC/FAO the implications of Port State Measures to the region will be explored during an expert gathering in March 2008
- Review of selected international fisheries conventions and other conventions with a view to how they are implemented in ASEAN-SEAFDEC Member Countries. Preparations will be completed to be able to organise a regional technical consultation (RTC) on the implications of international conventions and their implementation as relevant to fisheries in the region. The RTC to be held in late 2008 or early 2009
- Meetings and coordination maintained with APFIC/FAO, UNEP/GEF South China Sea Project, CONSRN, IUCN and Mangroves for the Future (MFF), RPOA IUU, MRC, Wetlands Alliance, AIT, CORIN, World Fish Centre, IUCN, WWF, CBNRM-LI, ICSF, COBSEA, etc

The other activities for in 2008 will be implemented in continuing and maintain the momentum of works having the same category of activities as mentioned for 2007 till the end of April 2008. Detail of the project activities, based on the proposal 2008 that submitted to Sweden in mid of 2007, appears in the *Appendix 2*.

## Expected Outcomes

The following are activities and their major expected outcomes for the year 2008:

Activities	Expected Outcomes
<b>1. Promote Regional Fisheries Management Mechanism</b>	
Regional Consultations on common ASEAN-SEAFDEC approaches to mitigate problems within the fishing sector (promoting steps towards a regional fisheries management mechanism)	Scope, framework and timelines for an ASEAN Fisheries Management Mechanism endorsed by SEAFDEC Council, the ASWGFi, and the ASEAN SOM-AFAM
	Implications of the Port State Measures to the region jointly explored with APFIC/FAO
	Workshop on MCS organized
	Workshop on Vessel Registration
Recommendation on results from project activities to ASEAN and ASEAN-SEAFDEC Member Countries and to policy making mechanisms	Recommendation and updates provided on the RFMM and cooperation in trans-boundary areas. Further endorsement by ASEAN Ministers expected.
National legislation and institutional arrangements pertaining to management of exploitation of fisheries and critical habitats	Reference collection on national legislation of the Member Countries expected
	Reports on the studies and analysis on the relevance of existing legal framework completed.
Review of selected international fisheries conventions and other conventions with a view to how they are implemented in ASEAN-SEAFDEC Member Countries	Reference collection and the matrix on conventions ratified by ASEAN Member Countries
	Preparation and further organization of the regional technical consultation on the implications of international conventions and their implementation as relevant to fisheries in the region
<b>2. Habitat and Fisheries Management</b>	
Develop criteria to determine the size of national, sub-regional and trans-boundary areas of significance (to fisheries and habitats management areas)	The approach to work on larger fisheries management conservation areas approved by countries around trans-boundary water areas
Define spatial boundaries for refugia development	Spatial boundaries for refugia development in Koh Kong, Kampot, Trat, Kien Giang, Quang Binh, and Haiphong Provinces defined based on the regionally developed criteria.
Review fisheries and habitat management systems in the identified provinces in Cambodia, Vietnam, Thailand and Philippines, Malaysia and Indonesia (Sulu Sulawesi Seas)	Available information on fisheries and habitat management systems in the identified provinces.
<b>3. Incentive for sustainable fishing/eco-labels</b>	
Prepare pilot activities on eco-labelling in three or sub-sectors	Perspectives and potentials for pilot work developed with ASEAN-SEAFDEC Member Countries
Study on the role of governments on eco-labelling in Southeast Asian Context	Role of government defined with the plan on how to promote the inputs provided by the government.



Study on the practicability and value of eco-labelling and the readiness of the fisheries sub-sectors	Report on the practicability and value of eco-labelling and the readiness of the fisheries sub-sectors developed, and further analyzed.
<b>4. Size and structure large-scale fisheries</b>	
Review available information on the size and structure of large-scale fisheries in ASEAN-SEAFDEC Member Countries	Profile of large-scale fisheries in ASEAN countries summarized, and further developed in cooperation with APFIC, RPOA and others.
Assess the status of large-scale fisheries over time relative to small-scale fisheries based on available information	Profile of small-scale fisheries in ASEAN countries documented.
Review, description and recommended revisions on MCS practices	The review, description and recommendations on MCS practices documented.
Available information on IUU by larger vessels and conflicts with small-scale fisheries	Profile of IUU fisheries in the ASEAN region summarized, and further developed in cooperation with APFIC, RPOA and others
Provide inputs on the management of large-scale fisheries to the ASEAN policy making mechanisms	Inputs to the ASEAN policy making mechanisms continuously provided.
<b>5. Monitor and record coastal fisheries</b>	
Initiate staff capacity building in Koh Kong, Kampot, Trat, Kien Giang, Quang Binh, and Haiphong Provinces to monitor and record active fishing capacity in coastal areas	Plan for staff capacity building in the identified provinces developed together with the fisheries agencies in each country.
Review and recommend on practicability of systems to monitor and record active fishing capacity	Set of recommendations developed, and MSC workshop organised.
Awareness raising on the need to provide alternative livelihoods to facilitate exit	Study on the role of women in Cambodia produced.
Promote further improvement, preparation and implementation of activity plans to manage fishing capacity	Management of fishing capacity promoted as a key element in the process to establish an ASEAN regional fisheries management mechanism.
<b>6. Local knowledge and safety at sea</b>	
Initiate process to improve or establish systems for registration of boats in Cambodia, Vietnam, Philippines, Thailand, Indonesia and Malaysia.	The importance of trying to improve ways of register boats discussed with the countries, and MCS workshop organized.

**SEAFDEC-Sida cooperation for extension, year 2007**

Status of actions and results so far: End of November 2007 (funds arrived end of March)

**1. Promote Regional Fisheries Management Body**

	<b>Status of Action</b>	<b>Result</b>
1. Regional Consultations on common ASEAN-SEAFDEC approaches to mitigate problems within the fishing sector (promoting steps towards a regional fisheries management mechanism)	ASEAN has been consulted and brainstorming on RFMM is being planned based on the endorsement and will be held 6 to 8 November 2007	<ul style="list-style-type: none"> <li>- Idea presented and approved by ASWGFi in May 2007 and ASEAN SOM-AMAF in August and Oct/Nov 2007</li> <li>- Working group for the planning of the RFMM event established</li> <li>- RFMM event planned for November 6 – 8, 2007</li> <li>- With Thai DOF as a host a roadmap meeting is now scheduled for middle of January 2008</li> </ul>
	Regional Consultation and Workshop on the Concept and of the Establishment of an ASEAN Fisheries Development and Management Mechanism , held in Bangkok, 6 – 8 November 2007	Clear recommendation in that SEAFDEC should continue to take a lead, together with DOF, Thailand. Conceptual points for consideration identified together with recommendations on scope and focus to be applied in the continued process. Result to be presented to ASEAN and ASWGFi
	Participation in a Regional Workshop to Support the Implementation of the Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region , 13 – 15 November 2007, Bangkok (see report from meeting)	The results and recommendations from the RFMM process presented and it was agreed that SEAFDEC and the SEAFDEC-Sida Project should work together in the development of the RPOA (see report from meeting)

	Preparations under way for an ASEAN-SEAFDEC consultation on the ASEAN Roadmap for the Integration of the Fisheries Sector	Prospectus developed for a meeting to be held 15 – 18 January 2008
	Participation in an exploratory expert Japanese Trust Fund meetings on the benefits of a “regional scientific advisory committee”, in June and October 2007 in Bangkok	The first meeting could not come up with directions or clear paths were to move. As confirmed during the second meeting what seems to be taking shape is more of an “internal” SEAFDEC project supporting mechanism. Importantly, it was, during both meetings, made very clear that this was distinctly different from the RFMM process in cooperation with ASEAN.
2. Recommendation on results from project activities to ASEAN and ASEAN-SEAFDEC Member Countries and to policy making mechanisms	Inputs provided to SEAFDEC Council, ASWGFi and SOM-AMAF on project results leading to the promotion of integration of fisheries management into habitat management with a focus on trans-boundary areas such as the Gulf of Thailand, the Andaman Sea , the Sulu Sulawesi Seas, the Mekong, etc as well as recommendation for the facilitation of a process leading towards the establishment of a regional fisheries management body or mechanism (RFMB/RFMM)	<ul style="list-style-type: none"> <li>- Suggestion to “move towards long-term establishment of a regional fisheries management mechanism” stated by the SEAFDEC Council in Siem Reap, 4 – 6 April 2007</li> <li>- Further approved by the ASWGFi in May 2007</li> <li>- Endorsed by the Preparatory SOM-AMAF in July/August 2007</li> <li>- Further endorsed by the SOM-AMAF in October 2007. During this event an agreement on the establishment of an “ASEAN-SEAFDEC Strategic Partnership” (ASSP) were also signed.</li> </ul>
	On request from Thai DOF providing advise to a Strategy Development Process for the Thai DOF and to the initiation of the establishment of a coastal management network for Thailand (August 2007, Nakornnayok Province)	<ul style="list-style-type: none"> <li>- Draft strategy being developed</li> <li>- Early draft for a coastal management network indicated</li> </ul>

3. National legislation and institutional arrangements pertaining to management of the exploitation of fisheries and critical habitats	Process ongoing to collect information and references	References starting to build up
	Support being provided to the CBNRM-LI in Cambodia to prepare a document for the ICSF symposium on “asserting rights” in Siem Reap, 3 - 8 May 2007	Study on “Asserting Rights, Defining Responsibilities: Small-scale Fishing Communities and Fisheries Management Perspective in Asia” prepared and presented by the CBNRM-LI at the Symposium
	Participation in the ICSF on “asserting rights”, Siem Reap, 3 – 8 May 2007	Active inputs were, including a plenary presentation, provided on experiences gained to the ICSF meeting. Participants from governments and NGO’s of Southeast and South Asia. The meeting itself provide through participants and presentations important inputs to upcoming processes. A Siem Reap Statement were formulated among NGO’s
4. Review of selected international fisheries conventions and other conventions with a view to how they are implemented in ASEAN-SEAFDEC Member Countries	Process ongoing to collect information and references	References starting to build up and a matrix on conventions ratified by ASEAN member countries available
	Participation in the ASEAN-SEAFDEC RTC on “Trade and Environment”, Chiang Mai, 5 – 7 Feb 2007	Discussions, information and some consensus were reached on with reference to the CITES and the UN Fish Stock Agreement
	Participation in the ICSF on “asserting rights”, Siem Reap, May 2007	The meeting provided reference and inputs on importance of key conventions, such as the UNCLOS, The ILO convention on “work in fisheries” and conventions related to human rights in the management of fisheries and in protection of rights of coastal communities and fish-workers

## 2. Habitat and fisheries management

	<b>Status of Action</b>	<b>Result</b>
1. Develop criteria to determine the size of national, sub-regional and trans-boundary areas of significance (to fisheries and habitat management) areas	<ul style="list-style-type: none"> <li>- Meeting organised in Bangkok in 2 July 2007</li> <li>- Recommendations followed up with UNEP/GEF/SCS Fisheries Component in Phu Quoc, 10 – 13 July 2007</li> </ul>	Recommendations established, and supported, to work on the establishment of larger fisheries management conservation. The main criteria are: <ul style="list-style-type: none"> <li>- To build upon an aggregation of smaller management areas (established for local fisheries and/or habitat management)</li> <li>- To recognise the existing zoning schemes (such as trawling free zones)</li> <li>- To take note of the seasonality in fishing and fish migration/spawning, etc.</li> </ul>
2. Define spatial boundaries for refugia development in Koh Kong, Kampot, Trat, Kien Giang, Quang Binh and Haiphong Provinces based on the regionally developed criteria	<ul style="list-style-type: none"> <li>- Informal discussion in/with Trat people (March)</li> </ul>	Expressed interest from Trat (DOF) to embark on dialogue with Koh Kong
	Steps to be taken discussed with Cambodia (30 April), Thailand (22 May) and Vietnam (20-21 June)	<ul style="list-style-type: none"> <li>- Loose framework drafted on steps to be taken in Cambodia, including documentation, training and planning workshop</li> <li>- Positive responses received from Cambodia and on-site training/workshop to be held in Koh Kong, 6 – 9 August 2007</li> </ul>
	On-site training/workshop held in Koh Kong, 6 – 9 August 2007	Boundaries discussed and ideas (of larger areas) in principle agreed upon and to be followed up again with maps.

3. Review fisheries and habitat management systems in the identified provinces in Cambodia, Vietnam, Thailand and Philippines, Malaysia and Indonesia (Sulu and Sulawesi Seas). – including bilateral cooperation if available	The work has been initiated with the arrival of the Working Group (in July/Aug) with collection of information available in files and through internet)	<ul style="list-style-type: none"> <li>- Lead coordination by Miss Ann-Mari and Mr. Sy Vann (RFPN-Cambodia)</li> <li>- Some information already available on Cambodia (collected in conjunction with the Koh Kong event)</li> </ul>
	To provide an overview, the team has initiated a process, starting with Cambodia, to collect information available on maps to get a summarised view on location and size of different management areas (defined for various purposes)	A draft “summary” map of different management areas available for Cambodia with materials provided during a consultation of Miss Ann-Mari and Mr. Sy Vann in September 2007
	Joint Kampot-Kien Giang/Phu Quoc meeting to work out an arrangement for cooperation between the two provinces, 26-28 May 2007, in Kampot, facilitated by UNEP/GEF/SCS	The draft that was worked out is broad enough in its scope (natural resources and environment) and flexible enough to allow to be used as an umbrella for other “trans-boundary” programmes between the two process – including the planned SEAFDEC-Sida work.
4. Survey information on status on important nursery grounds, spawning areas and coastal habitats for at least Koh Kong, Kampot, Trat, Kien Giang, Quang Binh and Haiphong Provinces, including identification of rehabilitation/restoration needs	<ul style="list-style-type: none"> <li>- To be followed up with working groups of UNEP/GEF/SCS Project in Sept/Oct.</li> <li>- Lead persons among the Working Group to be appointed.</li> </ul>	Lead coordination by RFPN-Thailand, Cambodia and Vietnam.

<p>5. Review with Indonesia, Malaysia and the Philippines attempts that have been made for cooperation (and development of refugia) in Sulu and Sulawesi Seas</p>	<ul style="list-style-type: none"> <li>- Follow up with national focal points of old project and fisheries working group of UNEP/GEF</li> <li>- Lead persons among the Working Group to be appointed</li> <li>- With Working Group Members from Philippines, Indonesia and Malaysia are all in place and will follow up with their respective countries</li> </ul>	<p>Lead coordination by one/two group members from Indonesia, Malaysia or the Philippines.</p>
	<p>Mr Arsenio Banares attend an event in Jakarta on fisheries in border areas of Indonesia and Malaysia in Eastern Kalimantan mid-August 2007</p>	<p>-SEAFDEC joined conflict settlement workshop in Indonesia.</p> <p>The Indonesia – Malaysia bordering area requires the most attention among the bordering areas in Indonesia and decided to prioritize East Kalimantan and West Kalimantan Provinces. The settlement of fishermen conflict and optimization of fisheries resources utilization in bordering area is integrated from the fisheries management and conflict is also solved gradually in accordance with management authority based on UU No.32 of 2004 about District Government.</p> <p>Presently, there is a proposal to establish a forum for settlement of conflict and will be coordinated by local Marine Affairs and Fisheries Offices and involving the stakeholder.</p>

### 3. Incentive for sustainable fishing/Eco-labels

	<b>Status of Action</b>	<b>Result</b>
1. Prepare for pilot activities on eco-labelling in three areas/sub-sectors <b>Note:</b> it has throughout consultation been made clear that there is no intention to embark upon “stand alone” pilots for eco-labelling but such activities have to link up with other activities with a purpose to promote sustainable fisheries (especially small-scale)	Preparations done looking at “candidates”: to avoid building up expectation of pilot activities with “sole” purpose of pilots for eco-labelling consultations have mostly been done in conjunction with other events, such as the on-site event in Koh Kong, 6 – 8 August 2007, Trad, 4 – 6 June 2007.	Candidates could include <ul style="list-style-type: none"> <li>- Crabs (mangroves) in Trad, Koh Kong and Kampot</li> <li>- Mackerel and other species in Chumpon and eastern Gulf of Thailand</li> <li>- Plara/Prahok in Cambodia, Laos and Thailand</li> <li>- Sardines in Southern Philippines</li> </ul>
	Meeting with MSC (Duncan L) at SEAFDEC, 22 March 2007	Useful experiences were shared on matters to consider when embarking upon pilot schemes. Information provided on MSC work on clams in Ben Tre, Vietnam, and Anchovy in Phu Quoc
	Although not on the agenda possible “candidates” where discussed with participants during the 27 – 30 March FAO/NACA certification workshop and the APFIC workshop in HCMC in 18 – 20 September 2007	Both crabs and mackerel seems to be good candidates to follow up on
	During the Fisheries Component Meeting of the MRC, in Chiang Rai, 25 – 26 October, 2007, the idea to look at fermented fish as a candidate was discussed with participants	In general positive responses were received and this as an area for cooperation with MRC will be followed up



<p>2. Provide result and information to ASEAN-SEAFDEC Member Countries</p>	<p>So far this has mostly been done in conjunction with meetings organised by APFIC, NACA and FAO</p>	<ul style="list-style-type: none"> <li>- Increased understanding of key elements in the labelling process, such as standards, certification</li> <li>- Increased understanding of the approach SEAFDEC intend to take by not starting “stand alone” pilots but build upon other initiatives working with sustainable fisheries – esp. small-scale</li> </ul>
<p>3. Study the role of governments on eco-labelling in a Southeast Asian Context</p>	<ul style="list-style-type: none"> <li>- A small expert meeting organised by SEAFDEC on 1 March in BKK</li> <li>- Inputs provided to and from March FAO/NACA certification workshop in Bangkok, 27 – 30 March 2007</li> <li>- Further inputs provided to and from APFIC workshop in HCMC in 18 – 20 September 2007</li> </ul>	<p>Results in summary from the various events with respect to the role of the government:</p> <ul style="list-style-type: none"> <li>- Recommendation provided on the role of the government and the message is clear in that there is a role for the government</li> <li>- Identified critical element is the certifying body and the role of the government in the establishment</li> <li>- Certification schemes could be developed out of less “ambitious” schemes than the “third party” schemes, with the government playing a supporting role</li> </ul>
<p>4. Study on the practicability and value of eco-labelling and the readiness of the fisheries sub-sectors</p>	<p>Meeting with FAO on upcoming activities related to eco-labels and their “values”</p>	<p>Information provided on upcoming events and invitations to be provided to FAO and SEAFDEC respectively</p>
	<p>Inputs provided to and from the March FAO/NACA certification workshop</p>	<p>One emerging message is that the “labels” would need to be broader than just “eco” to also include fair trade, social aspects, health aspects, etc</p>

	Further inputs to provided to and from APFIC workshop in HCMC in 18 – 20 September on certification of capture fisheries and aquaculture	
5. Promote active participation by ASEAN-SEAFDEC Member Countries in international fora on eco-labelling	This has not been needed so far thanks to the APFIC, FAO and NACA initiatives	

#### 4. Size and structure large-scale fisheries

	<b>Status of Action</b>	<b>Result</b>
1. Review available information on the size and structure of large-scale fisheries in ASEAN-SEAFDEC Member Countries	Starting point during the APFIC IUU meeting in Phuket, 13 – 15 June 2007	The meeting confirmed that there is not any reliable and/or aggregated information on the size and structure of larger scale fisheries (“everything” is IUU) – especially in the ASEAN region.
	Summary profile of large scale fisheries in ASEAN countries based on available information to be prepared by the Working Group	Lead coordination by
	A RPOA for Southeast Asia on IUU fishing has been established (eight ASEAN members have signed up)	Common objectives and similar activities to those of the SEAFDEC-Sida Project are there in the RPOA. Efforts to be made on how to develop means to cooperate for SEAFDEC with the RPOA needs still to be explored
	Participation in the “Regional Workshop to Support the Implementation of the Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region, Bangkok, 13 – 15 November 2007	Agreement was made that SEAFDEC-Sida Project should cooperate with RPOA on reviews of the large scale fisheries (see report from meeting)

2. Assess the status of large-scale fisheries over time relative to small-scale fisheries based on available information	The Working Group, have as available, included reference to this in short profiles that has been prepared on SSF (small-scale fisheries).	SSF profiles available for six ASEAN Countries
	This will be further followed in conjunction with the profiles of large scale (4.1) and small scale fisheries (5.2).	Lead coordination by
3 Initiate review, description and recommended revisions on MCS practices	With the Working Group the work will be initiated in last Quarter 2007, after the RPOA meeting in November 2007	Lead coordination by Mr. Martin and Mr. Arsenio
4. Initiate mapping and description of fishing areas for large-scale fisheries in the ASEAN region	Survey to be done on available maps and information.	Lead coordination by
5. Available information on IUU by larger vessels and conflicts with small-scale fisheries	Starting point during the APFIC IUU meeting in Phuket, June	The APFIC meeting provided a picture of fragmented, not official, information based on project, surveys, etc (by the very nature of IUU it is obvious that there can not be any official records)
	Participation in the RPOA meeting in Bangkok, November 2007	Cooperation agreed upon in the follow up on available information
	A meeting to be organised with FAO/RAPI, SEAFDEC and the Working Group in fourth quarter, after the RPOA meeting in November 2007, on how to proceed	Lead coordination by

6. Provide inputs on the management of large-scale fisheries to the ASEAN policy making mechanisms	Continuous as opportunities arise	
	Inputs provided during the process to develop the ASEAN Regional Fisheries Management Mechanism (RFMM)	Fishing capacity defined as the major focus in the process to develop the RFMM
	The RPOA IUU workshop 13 – 15 November 2007, Bangkok (see report from meeting)	Inputs provided during the RPOA IUU workshop 13 – 15 November 2007, Bangkok (see report from meeting) and continuous cooperation agreed upon

#### 5. Monitor and record coastal fisheries

	<b>Status of Action</b>	<b>Result</b>
1. Initiate staff capacity building in Koh Kong, Kampot, Trat, Kien Giang, Quang Binh and Haiphong Provinces to monitor and record active fishing capacity in coastal areas	This will be and will be followed up with Cambodia, Thailand and Vietnam after the first set of meetings/training on the integration of fisheries and habitat management	Initial discussions held and it is understood that actual activities will mainly be made once the new phase is agreed upon.
	The on-site training/workshop held in Koh Kong, 6 – 9 August 2007	The event in Koh Kong gave good indications that the Community Fisheries could be involved within their area – outside their areas they can/could be of limited, or no, support. However, they clearly stated problems with not having enough funds for monitoring (even for their own purposes)
	A meeting on capacity building for local staff in Kampot Province held together with Wetlands Alliance (WAP)/CORIN and the Fisheries Administration, Cambodia, 30/10 and 1/11	Format for cooperation in Kampot being worked out

	Discussions with the Ministry of Fisheries, Vietnam (now merged with the Ministry of Agriculture and Rural Development, MARD) held in connection with other meetings on staff capacity building in provinces of Vietnam	This will be followed up with a meeting in Hanoi to among other things explore the implications of the merging with MARD
2. Initiate assessment of level and type of fishing capacity in coastal areas including IUU by large-scale vessels in the above identified provinces	To be discussed with Cambodia, Thailand and Vietnam	More detailed discussions to be held after the first sequence of on-site training/workshops
	Summery profiles of Small-Scale Fisheries in (six) ASEAN countries being prepared by the Working Group	A first set of drafts for Cambodia, Indonesia, Malaysia, Philippines, Thailand and Vietnam is available
	Participation in the RPOA IUU workshop 13 – 15 November 2007	Inputs provided based on experiences from project activities and an understanding developed in that SEAFDEC will cooperate in the further development of the RPOA IUU (as reflected in the meeting report)
	To be followed up in connection with the profile of large scale fisheries and overall indication of IUU in fisheries	
3 Review and recommend on practicalities of systems to monitor and record active fishing capacity	Early next year when a sufficient pool of information would be available	Dialogue with member countries initiated  -
	Participation in the RPOA IUU workshop 13 – 15 November 2007	During the workshop it was suggested that with inputs from SEAFDEC a meeting should be held on MCS, with a focus on monitoring and control, during first quarter of 2008

4. Initiate drafting of plans to monitor and record active fishing capacity in Cambodia, Vietnam and Thailand – and Philippines, Indonesia and Malaysia (later on to be incorporated in the post-tsunami work)	Following and alongside the studies and reviews to be discussed with Cambodia, Thailand and Vietnam – and Philippines, Indonesia and Malaysia	Early discussions held in connection with the meeting on MCS
5. Awareness raising on the need to provide alternative livelihoods to facilitate exit	This is a continuous process and activity	<ul style="list-style-type: none"> <li>- The “message” has been forwarded at various meetings, including the IUU/APFIC in Phuket, June 2007, the ICSF seminar on “Asserting rights and Defining Responsibilities” in Siem Reap, May 2007, and the on-site training and workshop in Koh Kong, Aug 2007</li> <li>- In responses the message is clear that in looking towards alternative and supplementary income one can not only look at the fishermen – there is a need to look at the whole family and specifically the women (traditionally being the most active in selling and buying and also in non-fishing related activities.)</li> <li>- Discussions has been held with the CBNRM-LI in Cambodia to work on this</li> </ul>
	An important follow up would be to look at some of the areas where the project will be more active terms of integration of fisheries management into habitat management by looking at the role of women in diversifying the household income and provide supplementary means (see also below (6.1))	

6. Promote further improvement, preparation and implementation of activity plans to manage fishing capacity	The activity is continuous and the project staff is through participation in various events, also organised by others than SEAFDEC, bringing the experiences into the domain of the region and the member countries	<ul style="list-style-type: none"> <li>- Inputs provided during the RPOA IUU workshop 13 – 15 November 2007, Bangkok (see report from meeting)</li> <li>- Project staff participating in the drafting of new strategy for fisheries management in Thailand</li> <li>- Inputs provided to member countries during meetings referred to elsewhere such as the one on ASEAN Regional Fisheries Management Mechanism (RFMM)</li> </ul>
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**6. Local knowledge and safety at sea**

	<b>Status of Action</b>	<b>Result</b>
1. Survey local knowledge and actions among ethnic groups and coastal communities in Cambodia, Vietnam, the Philippines and Thailand (desk studies and review of available information)	<ul style="list-style-type: none"> <li>- To be discussed with Cambodia Thailand and Vietnam, the Philippines, Indonesia and Malaysia</li> <li>- In preparation for a meeting in Kampot and in connection with the study on the role of women mentioned above under 5.6 specifically look at the traditional role of women in fishing villages and specific coastal ethnic communities. .</li> <li>- Involve the Working Group</li> </ul>	It will initially be followed up by the Working Group at SEAFDEC
2. Initiate process to improve or establish systems for registration of boats in Cambodia, Vietnam, the Philippines and Thailand – and Indonesia and Malaysia	APFIC Meeting on IUU, July, Phuket	The meeting highlighted the importance of trying to improve ways of register boats
	Establishment of a Regional Fisheries Management Mechanism (RFMM), 6 – 8 November 2007, in Bangkok	The consultation recommended that vessel registration was a key are for a RFMM to consider

	Participation during the RPOA IUU workshop 13 – 15 November 2007, Bangkok (see report from meeting)	Inputs from the RFMM provided and it was recommended that SEAFDEC should try to organise a consultation of vessel registration in mid-2008
	To be discussed with Cambodia, Thailand, Vietnam, the Philippines, Indonesia and Malaysia	
	A dialogue should be initiated or continued with the SBF on how best to link up with their cooperation with Indonesia	



**SEAFDEC-Sida cooperation 2008 onwards**

Proposed First 12 Months, 2008, Activities

**Promote Regional Fisheries Management Body**

	M 1	M2	M 3	M4	M 5	M 6	M7	M 8	M 9	M 10	M 11	M 12
1. Regional Consultations on common ASEAN-SEAFDEC approaches to mitigate problems within the fishing sector												
2. Recommendation on results from project activities to ASEAN and ASEAN-SEAFDEC Member Countries and to policy making mechanisms												
3. Review the criteria and indicators currently in use at the national level for decision making on future use of fisheries and coastal areas, with recent changes												
4. Review how poorer fishing households are affected by natural hazards and non-fisheries development in coastal areas	Y2											
5. National legislation and institutional arrangements pertaining to management of the exploitation of fisheries and critical habitats												
6. Review international fisheries conventions and other conventions with a view to how they are implemented in ASEAN-SEAFDEC Member Countries												
7. Regional Technical Consultation with ASEAN-SEAFDEC Member Countries on the implications of international conventions and their implementation as relevant to fisheries in member countries												
8. Tour to Scandinavia for references from the Baltic and North Sea on the development of regional fisheries organisations	Y2											
9. Other regional FAO-ASEAN-SEAFDEC, etc events organised if called upon to promote policy dialogue and coordination	Y2											

### Habitat and fisheries management

	M 1	M2	M 3	M4	M 5	M 6	M7	M 8	M 9	M 10	M 11	M 12
1. Follow up on the criteria to determine the national, sub-regional and trans-boundary significance of specific areas												
2. Monitor relevance of spatial boundaries for refugia development in Koh Kong, Kampot, Trat, Kien Giang, Quang Binh and Haiphong Provinces												
3. Review fisheries and habitat management systems in the identified areas in Cambodia, Vietnam and Thailand												
4. Review and recommend on systems to protect important nursery grounds and spawning areas for at least Koh Kong, Kampot, Trat, Kien Giang, Quang Binh and Haiphong Provinces												
5. Information for capacity building on fish stocks conservation and sustainable practices among province and district offices in Koh Kong, Kampot, Trat, Kien Giang, Quang Binh and Haiphong Provinces												
6. Improved management of crabs and selected fishing practices in at least Trat, Koh Kong and Kampot (link to eco-labelling)												
7. Information and capacity building on the importance to maintain coastal features to province and district offices in Cambodia, Vietnam and Thailand												
8. Restore selected features, such as mangroves in areas such as Trat, Koh Kong, Kampot and Quang Binh												
9. Management regimes based on the integration of fisheries management into habitat management (refugia) in Koh Kong, Kampot, Trat, Kien Giang, Quang Binh and Haiphong Provinces	Y2											
10. Develop priorities for management fisheries and areas of importance for nursery and spawning for the Gulf of Thailand	Y2											
11. Develop priorities for the restoration and maintenance of geographical features in coastal areas												

12. Process to develop regional and national action plans to develop a regional system of refugia												
13. Simple assessments on how levels of productivity might change over time due to geographical and hydrological changes	Y2											
14. Process with Indonesia, Malaysia and the Philippines on the development of refugia in Sulu and Sulawesi Seas												

**Eco-labels**

	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12
1. Pilot activities on eco-labelling in four areas/sub-sectors (see also activity 6 under habitat and fisheries management)												
2. Provide result and information to ASEAN-SEAFDEC Member Countries												
3. Revisit the role of governments on eco-labelling in a Southeast Asian Context												
4. Follow up on the Study on the practicability and value of eco-labelling and the readiness of the fisheries sub-sectors												
5. Active participation by ASEAN-SEAFDEC Member Countries in international fora on eco-labelling												

**Size and structure large-scale fisheries**

	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12
1. Review available information on the size and structure of large-scale fisheries in ASEAN-SEAFDEC Member Countries												
2. Assess the status of large-scale fisheries over time relative to small-scale fisheries												
3. Review, describe and recommend revisions on MCS practices												
4. Map and describe fishing areas for large-scale fisheries in the ASEAN region												
5. Assess and build capacity for the assessment of IUU by larger vessels and conflicts with small-scale fisheries												



## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Assistance of Capacity Building in the Region to Address International Trade Related Issues

**Lead Department:** The Secretariat

**Lead Country:** Thailand

**Total Duration:** 2004-2008

**Proposed 2008 Budget:** US\$47,000

### 1. INTRODUCTION

The program on Assistance of Capacity Building in the Region to Address International Trade Related Issues (formerly refers to 'Fish Trade and Environment') is in line with SEAFDEC's Strategic Plan on Fisheries to effectively safeguard its member countries' interests and welfare against unfair treatment, which may jeopardize the national or regional fisheries resources sustainability. This program has been fittingly identified to enhance and strengthen competitiveness, cooperation and joint approaches in addressing international as well as regional issues and problems affecting fish trade and the environment in Southeast Asia through the formulation of regional fisheries policies.

Through the program, the participation of ASEAN-SEAFDEC member countries particularly the fisheries-related government agencies has become active and visible particularly in the conduct of the preparatory and negotiation works at the country level to strengthen national policy including regional positions and requirements for the trade of fish and fishery products.

The significance of the program was initially collaborated in November 1999 when the SEAFDEC Preparatory Meeting on Issues of International Fish Trade and Environment was convened to discuss about pertinent issues on fish trade and environment in order to meet squarely the demands required of the upcoming WTO Ministerial Meeting in Seattle. During the 1999 Fish Trade Meeting, recommendations were formulated and adopted based on the issues and initiatives that have been discussed internationally that have so much bearing to the region's trade of fish and environment such as Sustainable Fisheries and Sustainable Fish Trade; the US Shrimp Embargo on some ASEAN-SEAFDEC Member Countries; Fisheries Subsidies; SPS; CITES; Eco-labelling; etc.

Since then, SEAFDEC has always gone step ahead to continuously clarify its regional requirements for fish trade and its related issues by means of Regional Consultations, where the ASEAN Member Countries and SEAFDEC identify and discuss on the issues of common interest. Convening of such consultations has produced recommendations to aid ASEAN-SEAFDEC member countries in dealing with these international issues and initiatives.

### 2. PROGRAM

#### 2.1 Objective:

The objectives of this project are as follows:

- 1) To monitor and review potential international fish trade related issues;
- 2) To identify and analyze potential impacts of international fish trade related issues on sustainable fisheries development in Southeast Asia; and
- 3) To develop regional policy recommendation on international fisheries related issues for ASEAN-SEAFDEC member countries.

## 2.2 Program description:

Recognizing the issues on trade in fish and fish products are greatly discussed and driven by international market and by various organizations, which rarely involve with fisheries authorities, and sometimes lack of contribution of sustainable fisheries development and management aspects. Those instruments that have been agreed or enforced by international organizations would determine impacts on sustainable development of fisheries in Southeast Asian region, particularly developing countries and small-scale fisheries. In accordance to this, it is important to reconcile the international driven issues with the promotion on sustainable fisheries development.

Past to present, 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 on international concern such as the issues under UN General Assembly, WTO, FAO and CITES. The outcomes of regional discussions and conclusion were analyzed and came up with future regional action plan as well as 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 and providing support to the Member Countries through appropriate channels in order to reflect the regional collaborative efforts in managing fisheries and assist the Member Countries in development regional common/coordinated positions, as well as push forward integration of views from fisheries agencies into those international instruments.

## 3. PROGRESS activities IN THE YEAR 2007

### Project Activities:

Project/Activity Title	Duration	Remarks
1) Regional Technical Consultation	February 2007	100% completed
2) In Depth Study on the Issues Identified by the RTC	January-April	100% completed
3) Participation to FAO COFI	March	100% completed
4) Participation to other Relevant Regional/International Forum	March	100% completed
5) Production of Promotional Brochure and materials for Support the Member Countries	January-April	100% completed

SEAFDEC organized the ASEAN-SEAFDEC Regional Technical Consultation (RTC) on International Fisheries Related Issues 2007 in Chiang Mai, Thailand from 5 to 7 February 2007. Objectives of this Consultation were to: 1) review and discuss important international fisheries related issues relevant to the region, 2) develop coordinated/common positions on each respective issue among the Member Countries, and 3) discuss proposed new modality for regional cooperation in addressing international fisheries issues.

ASEAN and SEAFDEC Member Countries agreed with the conclusion on regional direction towards the issues on Code of Conduct for Responsible Fisheries (CCRF); Small-scale Fisheries Related Issues; Fish Trade Related Issues; Aquaculture Related Issues; Issues Related to Commercially-Exploited Aquatic Species and CITES CoP-14; Fisheries Subsidies under WTO;

as well as coordinated positions and point of views of ASEAN-SEAFDEC Member Countries at the forthcoming 27<sup>th</sup> Session of FAO Committee on Fisheries (COFI). In addition, the Consultation also provided suggestion and comments to the ‘Draft Proposed New Modality for Regional Cooperation in Addressing International Fisheries Related Issues’.

Subsequently, SEAFDEC Secretariat analyzed the issues related to international fish trade addressing the key points that may affect sustainable fisheries development in the region as well as highlighted the conclusion and recommendations made at various meetings initiated by the Member Countries and SEAFDEC. The synthesized paper including policy recommendation was submitted to the 39<sup>th</sup> Meeting of SEAFDEC Council as an ‘Executive Summary of International Fisheries Related Issues 2006-2007’.

In March 2007, SEAFDEC dispatched senior officials to the 27<sup>th</sup> Session of FAO COFI which was taken place in Rome, Italy from 5<sup>th</sup> to 9<sup>th</sup>. SEAFDEC participation helped facilitate confirmation and consolidation of coordinated positions among the Member Countries, which was considered as a follow-up to the previous RTC and safeguard the region’s interests, as well as monitored the outcome of the meeting which were among of interests/importance to the region. In addition to the FAO COFI, Senior official of SEAFDEC Secretariat also attended the First Meeting of the Regional Fishery Bodies - Secretariats Network held from 12 to 13 March 2007, organized by FAO in Rome, Italy. SEAFDEC representative was appointed as a vice-chair to coordinate with other RFBs, which share similar concerns on small-scale fisheries and requirements of developing countries.

#### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1) Regional Technical Consultation	February	Base on Requirements
2) In Depth Study on the Issues Identified by the RTC	Feb.-Nov.	In depth study on the issues follows up the outcome of RTC
3) Participation to FAO Sub-Committee on Fish Trade COFI	2-6 June	-
4) Production of Promotional Brochure and materials for Support the Member Countries	Feb.- Nov.	Collected information inclusive of actions taken by SEAFDEC will be publicized

##### 4.2 Expected Outcomes

- 1) Based on the requirement and indicative informed by the Member Countries through SEAFDEC Program Committee Meetings and/or ASEAN-SEAFDEC Fisheries Consultative Group Meetings, it is anticipated that the ASEAN-SEAFDEC Regional Technical Consultation on International Fisheries Related Issues (2008) will be organized, where appropriate;
- 2) Analysis of international fisheries related issues will be produced as one of the main inputs to SEAFDEC policy-base paper namely ‘Executive Summary on International Fisheries Related Issues 2007-2008’. This paper will be further submitted to the 40<sup>th</sup> Meeting of SEAFDEC Council and the 16<sup>th</sup> Meeting of ASWGFi for their consideration and support;

- 3) SEAFDEC will dispatch representative(s) to the FAO COFI Sub-Committee on Fish Trade that will be held in Bremen, Germany from 2 to 6 June 2008 in order to support the Member Countries along line with policy directives given by the SEAFDEC Council and ASWGFi; and
- 4) Appropriate information related to regional efforts on international fisheries related issues will be publicized and distributed through various channels.



## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Strengthening Small-scale Fisheries Management through the Promotion of Rights-based Fisheries and Co-management

**Lead Department:** Training Department

**Lead Country:** Indonesia

### 1. INTRODUCTION

*“The Regional Guidelines for Co-management Using Group User Rights for Small-scale Fisheries in the Southeast Asia”* was developed under the Special 5-year Program on Sustainable Fisheries for Food Security in the ASEAN Region: Towards Decentralized Management of Sustainable Fisheries in the ASEAN Region. Basically, the guidelines were developed based on innovative concepts and approaches, rights-based fisheries and co-management, through a series of consultations with ASEAN-SEAFDEC member countries. The guidelines were finalized by the member countries at the end of the year 2005 to be published at the beginning of 2006.

In 2006 SEAFDEC secretariat will promote and enhance knowledge and understanding of ASEAN member countries on the Rights-based Fisheries and Co-management approaches for the improvement of the small-scale fisheries management system of their countries. The guidelines will be disseminated and used as a basis document for this promotion and implementation of all activities of this project. Follow up with RTC on Rights-based Fisheries and Co-management Systems for Small-scale Fisheries, Jakarta, July 2005, SEAFDEC member countries are encouraged to conduct appropriate national consultation to enhance awareness, review existing projects and experiences on small-scale fisheries management and to investigate the applicability of the regional guidelines.

### 2. PROGRAM OBJECTIVES

In strengthening management for small-scale fisheries, it is envisaged that the regional guidelines will form the basis to clarify strategies for this purpose. The project is therefore proposed with the following specific objectives:

- 1) The regional guidelines on “Co-management Using Group User Rights for Small-scale Fisheries in the ASEAN Member Countries” will be promoted and clarified with responsible management institutions in the member countries through various kinds of activity;
- 2) The regional guidelines on “Co-management Using Group User Rights for Small-scale Fisheries in the ASEAN Member Countries” will be verified through case study process in some selected member countries for the improvement on applicability of the guidelines in the ASEAN region.
- 3) The human capacity on rights-based fisheries and co-management of fishery management institutions at all levels: community, local and central government, is enhanced; and

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

Regarding the unclear financial situation and fund not be allocated, the activities for the year 2007 could not be implemented but the project still be intended to maintain dialogues with partner organizations in mainstreaming concept and application of co-management with emphasis on the application of rights-based fisheries management for small-scale fisheries and continued to provide policy and technical advices.

#### **4. PROPOSED ACTIVITIES FOR THE YEAR 2008**

All proposed activities under this project will be transferred to the project entitled “Promotion of Rights-based Fisheries through Co-management Approach for Small-scale Fisheries in the Southeast Asian Region” under the program on the Promotion of Rights-based fisheries and co-management towards institutional building and participatory mechanism for coastal fisheries management.

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region

**Lead Department:** The Secretariat

**Lead Country:** Thailand

**Total Duration:** 2007-2009

### 1. INTRODUCTION

Fishery statistics, data and information in fisheries which generally also include registration, records, reporting, census and surveys, and other data and information including indicators; use of advanced information technology and database that are derived either from routine and non-routine system are widely accepted as basis and being crucial for determination of national fisheries policies, formulation of national management frameworks and actions or even basis for understanding the status and condition of fisheries resources.

SEAFDEC plays a prominent role in fishery statistics in Southeast Asia and has been assembling regional fishery data and information for many decades. SEAFDEC's support and direction on improvement of fishery statistics in the region are strengthening national fishery statistical systems, maximize their use for fisheries planning and management, and develop standard definitions and classifications to facilitate regional fishery statistics and information exchange. SEAFDEC is currently implementing a number of collaborative programs/projects and initiatives related to data and information on fisheries in the region to support member countries in improving statistics, data and information for management and planning of fisheries. However, the implementation of activities and outcomes from each project was planned in isolation resulted in lacking of focus in the improvement of data and information collection, analysis and presentation that lead to the lack of their usage for effective planning and management of fisheries.

It was found that there are still many issues and constraints under current situation in relation to the usage of quality fishery statistics, data and information to support development planning and management of fisheries. They are i.e. framework and direction are not well coordinated and implemented; lack of shared objective and direction to complement each other; need of clear objectives and usage at various levels; statistics for management requirements; and linkages and coordination between routine and non-routine data collection. In addition, problems still exist on quality, timeliness, accuracy of data and information for maximizing their usage for effective planning and management.

SEAFDEC recognized the importance of better understanding and knowledge of fisheries in the region for development planning and management of fisheries to achieve sustainable fisheries and food security purposes. To fulfill this goal, it is generally noted that fishery statistics, data and information are important foundation which required improvement of better national fishery statistical system in terms of quality, availability, reliability, accuracy and timeliness of statistics in line with the minimum requirements and the regionally standardized definitions and classifications for fishery statistics to facilitate regional compilation, analysis and data exchange, as well as ways and means to present information in user-friendly manner for management and decision-making. In addition, data and information from other sources are also crucial important that linkage and integration and harmonization should be promoted in maximizing its utilization for effective planning and management of fisheries.

## 2. PROGRAM

### 2.1 Objectives

The overall objective 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, which can be achieved through development of status and trends of fisheries and aquaculture in the region based on effective utilization and harmonization of information for fisheries management at national level under the harmonized definitions, standards and classification of fishery statistics at regional level. The specific objectives are as follows:

- 1) To improve better knowledge of fisheries for development planning and management through development of status and trend of fisheries and aquaculture in Southeast Asia;
- 2) To streamline reporting of fishery statistics from the member countries to SEAFDEC and FAO through the new framework of SEAFDEC Fishery Statistical Bulletin of Southeast Asia;
- 3) To harmonize definitions, standards, and classification of fishery statistics and information to facilitate data sharing and exchange in the region;
- 4) To improve better utilization and harmonize information from projects implemented by SEAFDEC for fisheries management in Southeast Asia; and
- 5) To enhance capacity of the member countries in development, integration and maximizing usage of data and information for development planning and management of fisheries through the process, mechanism and outputs to promote in country coordination and inter-countries coordination based on dialogues among agencies and countries concerned.

### 2.2 Program description

The project will support the Member Countries in achieving sustainable fisheries objectives based on sound fisheries policies and management strategies that will be derived from quality statistics, data and information. The project aimed to address these issues to better utilization and harmonized information to support development planning and management of fisheries through development of status and trend of fisheries and aquaculture, through facilitating cooperation in the region both at national and regional levels by mobilizing data and information from various sources. The project will be implemented in collaboration with regional and international organizations.

Based on past achievement and experiences in supporting the member countries in improvement of fishery statistical systems, the project will build on top from the past achievement and develop the linkage/coordination and integration of existing data and information for maximizing its utilization for planning and management of fisheries at national and regional level.

## 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

Project/Activity Title	Duration	Remarks
<b>Component 1: Streamline Reporting of Fishery Statistics from the Member Countries to FAO and SEAFDEC through the new framework of SEAFDEC Fishery Statistical Bulletin of Southeast Asia</b>		
<i>Activity 1.1: Streamline Reporting of Fishery Statistics from the Member Countries to key partner agencies and SEAFDEC through harmonized questionnaires</i> - The final draft of the Framework of Fishery Statistics of Southeast Asia has been developed in consultation with the Member Countries	Jan.– Dec. 2007	95% completed

<p>and Departments concerned. The framework will be finalized at the RTC on Fishery Statistics to be organized in December 2007</p> <ul style="list-style-type: none"> <li>- The Consultation with key partner agencies (FAO) to harmonize questionnaire and streamline reporting fishery statistics from the Member Countries was conducted from 5 to 9 March 2007, and follow-up</li> <li>- Development work on harmonized questionnaires of SEAFDEC to be streamlined with FAO is going on. The draft harmonized questionnaire will be consult with Member Countries during the RTC on Fishery Statistics to be organized in December 2007.</li> </ul>		<p>100% completed</p> <p>90% completed</p>
<p><b>Component 2: Harmonization of Standards/Norms, Classification and Definition of Fishery Statistics and Information in the Region</b></p>		
<p><i>Activity 2.1: Participation in relevant international, regional and national development of standards, norms, classification and definition for fishery statistics and information at the international and regional levels</i></p> <ul style="list-style-type: none"> <li>- Participation and presentation of SEAFDEC to the 22<sup>nd</sup> Session of the Coordinating Working Party on Fishery Statistics; and the 4<sup>th</sup> Session of the FIRMS Steering Committee Meeting was conducted at FAO, Rome, Italy from 26 February to 2 March 2007 to present on-going SEAFDEC activities relating to fishery statistics, data and information, as well as providing inputs for discussion to the meetings on respective agenda items on behalf of the region.</li> <li>- Regional Technical Consultation on Fishery Statistics and Information will be organized from 12 to 14 December 2007 in Bangkok, Thailand: to create the common understanding on the new framework of SEAFDEC Bulletin as the framework of fishery statistics in Southeast Asia as well as a framework to facilitate long-term improvement of fishery statistics at the national level; and to discuss and conclude the harmonized questionnaire and streamline reporting of fishery statistics from Member countries to SEAFDEC and FAO.</li> <li>- Participation to the APFIC Regional Consultative Workshop on Managing Fishing Capacity and IUU in Asia, 13-15 June 2007, Phuket, Thailand to monitor and coordinate the related issues of fishery statistics and information for fisheries development planning and management</li> <li>- Participation to the Technical Consultation Meeting on Fishery Information Gathering for Fishery Policy and Management Project, 21-22 August 2007 (1<sup>st</sup> activity), Bangkok, Thailand, as collaborating agency with FAO in the implementation of the project of DOF Thailand (2007-2009) to improve fishery information for planning and management that in line with SEAFDEC project.</li> </ul>	<p>Feb.- Mar. 2007</p> <p>Dec. 2007</p>	<p>100% Completed</p> <p>Not yet conduct</p> <p>100% Completed</p> <p>100% Completed</p>
<p><b>Component 3: Status and Trends of Fisheries and Aquaculture in Southeast Asia (STF)</b></p>		
<p><i>Activity 3.1: Visits the Member Countries for the Planning Consultation and Following-up work</i></p> <ul style="list-style-type: none"> <li>- To develop Status and Trends of Capture Fisheries and Aquaculture in Southeast Asia, a visit to the one of pilot countries – the Philippines was conducted from 5 to 7 June 2007 for the Planning Consultation. After the consultation, the formulation of Activity Proposal on Development of National Status and Trend of Fisheries (STF) in the Philippines was done. The Consultation among national agencies concerned to identify the agencies’ focal points as well as to elaborate detailed process, and respective role and responsibility in developing a national STF report was implemented.</li> </ul>		<p>50% Completed</p>



and other organizations as well as the Member Countries in the region through the regional/national meetings/workshops will be conducted.		
<b>Component 3: Status and Trends of Fisheries and Aquaculture in Southeast Asia (STF)</b>		
<p><i>Activity 3.1: Visits the Member Countries for the Planning Consultation and Following-up work</i></p> <p>- To develop status and trends of fisheries and aquaculture in the region as basis for development planning and management of fisheries, 3 pilot countries will be selected for this development of national STF, including the process and mechanism to be conducted. Those are a country that has advance development of fishery statistics and information, a country that inland fisheries play very important role, and a country that are archipelago nature and fisheries is diversified. Criteria for consideration in selecting the pilot countries are the interest and readiness of the countries as well as subject to the availability of fund. Visits to 3 Member countries for the Planning Consultation and follow-up work will be conducted.</p>	Jan-Dec. 2008	
<p><i>Activity 3.2: Identification of national focal points/experts</i></p> <p>- Based on the result and outcomes from the Planning Consultation with each of the 3 member countries, identification and appointment of expert/focal point of each country will be conducted. The expert/focal point will be mobilized for consolidation of all data and information as well as package the STF of respective pilot countries.</p>	Jan-Dec. 2008	
<p><i>Activity 3.3: National Consultations</i></p> <p>- Based on the result and outcomes from the Planning Consultation, the National Consultation will be organized one time each for respective 3 pilot countries. Objective of the national consultation is to discuss and conclude the draft national STF for further finalization.</p>	Jan-Dec. 2008	

### Expected Outcomes

- 1) Streamlined data reporting from the Member Countries to SEAFDEC and FAO, including the harmonized questionnaires;
- 2) 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;
- 3) Better utilization and harmonized information from projects implemented by SEAFDEC relevant to fisheries management in Southeast Asia.
- 4) Framework/concept, process, and mechanism for production of STF from 3 pilot countries to be applied at regional level and other countries in Southeast Asia.

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Responsible Fishing Technologies and Practices (Reduction of Discards and By-catch (Juvenile and Trash) and Negative Impacts of Fishing Practices on Fisheries Resources and Ecosystem in Southeast Asia)

**Lead Department:** Training Department

**Lead Country:**

**Duration:** Since 2006

### 1. INTRODUCTION

The current status of many fishery resources in the Southeast Asian region is of serious concern. A growing national and international demand for fish and fishery products has led to the continued development and adoption of modern fishing technologies, including new and improved boat design, fishing gear and deck equipment. Overall, fisheries production in the ASEAN region has increased during the past decade, although in some regions, localized depletion of fisheries resources has resulted in reduced landings or catch compositions that comprise mainly smaller and less valuable species. Significant contributors to the problem of deteriorating fisheries resources are over-exploitation practices and non-selective fishing gear. The impact of these is devastating, and ineffective management plans and law enforcement have, to date, failed to reduce these fishing pressures. Additionally, contributions to resource deterioration include excessive fishing effort, over-capacity and non-fisheries related impacts like the destruction of estuarine habitats, housing developments and water pollution.

Solutions to the problem of over-exploitation and habitat degradation in the region are both difficult and complex. The conflicting socio-economic problems associated with an increasing population and a need to maintain food security and people's livelihoods are significant. Under these circumstances, there is a lack of appreciation and awareness of the need for selective fishing gear that has minimal impact on aquatic ecosystems. Despite increased emphasis on the sustainable harvesting of fisheries and their resources, a lack of standardized research methodologies, particularly in gear selectivity research, coupled with the difficulties associated with the design and introduction of effective selectivity devices in multi-species fisheries, makes it difficult to overcome these problems.

Greater collaboration and commitment are required from ASEAN Member countries to reduce the impact of illegal and destructive fishing gear and practices and the use of responsible fishing technologies and practices must be promoted to maintain the integrity of the aquatic environment and the sustainability of fisheries resources.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To reduce discards and capture of juvenile and trash brought about by various types of fishing gear and practices
- 2) To reduce the use of illegal and destructive fishing gear and practices and the negative impact made by fishing
- 3) To promote the use of selective, passive and environmentally friendly fishing gear and practices
- 4) To raise awareness about responsible fishing by producing and disseminating information packages
- 5) To cooperate and work with member countries and other organizations



## **2.2 Program description**

Since the year 2007 the project implementation has been supported by the Japanese Trust Fund III in conjunction with GEF/UNEP/FAO Project on Sustainable Shrimp Trawling. TD will manage and coordinate all project activities as a responsible Department for this project. Collaborative arrangements with FAO, DOF of member countries and other organizations and institutes will be made through the implementation of the project. They will include staff exchanges, dispatch of experts and participation in meetings/workshops.

## **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

### **3.1 Research and promotion for responsible fishing technologies and practices in the region**

TD in collaboration with national agencies conducted surveys for assessment on the use of JTEDs and the cost-effectiveness. The assessment survey was conducted in Malaysia (16-20 July 2007 and 6-16 August 2007) and the Philippine (15-20 October 2007). The surveys used a questionnaire which consists of 2 main parts: Part I is general information about fishermen, fishing boat and fishing operation. Part II is data of JTEDs understanding, using and impact including attitude of fishermen in JTEDs.

The promotion and demonstration of the use JTEDs were implement in two countries. The promotion was carried out in Malaysia during 16-20 July and 14-17 August 2007. In Thailand, the project staff as technical assistant promoted the use JTEDs to Thai fishermen and fishery officers during 29-31 October 2007.

The study tour survey on the adoption of JTEDs in Calbayok City, the Philippine was conducted during 15-20 October 2007. Moreover, the project staff made a discussion with core experts on fishing gear in Malaysia, Indonesia and Thailand to prepare them to visit Calbayok City.

### **3.2 Interaction between the Threatened Species of International Concern and Fisheries**

TD collaboration with FAO organized SEAFDEC-FAO Workshop on Assessing the Relative Importance of Sea Turtle Mortality Due to Fisheries in Southeast Asia at Bangkok, Thailand during 19-23 March 2008.

In order to exchange and collect information for further improvement and development as well as to present SEAFDEC activities related to responsible fishing and practices which were conducted in Southeast Asian countries to international forum, TD staff participated in international meetings as following:

- 1) IPSC Meeting in Nigeria and Workshop in Cameroon during 13-18 February 2007
- 2) ICES-FAO Working Group on Fishing Technology and Fish Behavior Meeting in Dublin, Ireland during 21-29 April 2007
- 3) FAO Workshop on Interaction between Sea Turtle and Trawl Fisheries in Madagascar during 9-18 June 2007
- 4) The AFS Meeting in San Francisco, USA. during 2-8 September 2007

### **3.3 Compilation of Fishing Gear and Methods for Marine and Inland Capture Fisheries in the Region**

The field survey and finalized work on fishing gear and method of marine capture in Myanmar were conducted during 3-6 September 2007. Fishing gears and methods in Vietnam was revised and produced. Moreover, CD-Rom of fishing gear and methods in the Philippines and Myanmar (island) was produced and it is uplinked to the Internet.

### 3.4 Study/promotion on fishing that affects ecosystems

The experiment on Luring light fishing was carried out in Rayong Province in collaboration with DOF, Thailand on 5 February and 19-23 February 2007 respectively. The experiments focused on the light intensity and its efficiency.

Study on wind energy for propelling fishing boats under a project on impact of fishing technologies on the environment was carried on. A sail like spinnaker was designed for suitable installation on a medium fishing boat. A kite for sailing is an alternative propulsion method for small fishing boat. Efficiency test will be conducted before the end of year.

### 3.5 Production and dissemination of information packages

Through the year 2007, promotional materials aimed to disseminate information and raise awareness on responsible fishing and practices were produced as following:

- 1) VCD on The study of luring effected to the squid behavior
- 2) VCD on Promotion of JTEDs in Perak, Malaysia
- 3) Publication on Guideline for Trawl Fishery
- 4) Publication on JTEDs in Vietnam
- 5) Publication on JTEDs in Cambodia
- 6) Poster of the overview concept of responsible fishing technology and practice

### Project Activities

Project/Activity Title	Duration	Remarks
<b>Research and promotion of Responsible Fishing Technologies and Practices in the Region</b>		
- Assessment of JTEDs implementation in Southeast Asia	Jul., Aug., Oct	90%
- Promotion on the Use of JTEDs for Malaysia, Myanmar, and Indonesia through Demonstration and Experiment	Jul., Aug., Oct	70%
- Promotion on the use of JTEDs for SEAFDEC member countries through study tour program to SEAFDEC/TD and the Adopted JTEDs site in the Philippines	Jan-Dec	80%
<b>Interaction between the threatened Species of International Concerns and Fisheries</b>		
- Workshop on Interaction between Sea turtle and fisheries (In collaboration with FAO)	March	Completed
- Information Collection on Interaction of Sea Turtle and fisheries in Purse seine and other gears	Jan-Dec	On going
- Participating of International Meeting	Jan-Dec	Completed
<b>Compilation of Fishing Gear and Methods for Marine and Inland Capture Fisheries in the Region</b>		
- Monograph of Fishing gear and method in Myanmar	Sep.	90%
- Monograph of Fishing gear and method in Indonesia	Jan-Dec.	On going
<b>Study/Assessment of Impact of Fishing Technologies to the environment</b>		
- Impact of luring light Fishery	Feb.	90%
- Trawl Fisheries and Code of Practices for Responsible Trawl Fishery	Jan-Dec	30%
- Study on Wind energy	Jan-Dec	40%
<b>Production and dissemination of information package</b>	Jan-Dec	Completed

#### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

Program/Project /Activities	Duration	Remark
<b>Research and development of selective fishing gears and devices for reduced discards and by-catch of juvenile and trash in the region</b> <ul style="list-style-type: none"> <li>- Assessment of JTEDs implementation</li> <li>- Research and development on selective devices in trawl and other fishing gears</li> <li>- Promotion on the use of selective fishing gears and selective devices</li> </ul>	May-Jun., Sep-Oct. Apr-Jun., Sep-Oct.  Jun-Aug	
<b>Research and study of the assessment of impacts of various kinds of fishing gear and practice on fisheries resources, sea beds, environment and ecosystem</b> <ul style="list-style-type: none"> <li>- Research and study on impacts of light fishing on fisheries resources in Southeast Asia</li> <li>- Research and study on impacts of bottom trawl net, dredges, traps and others</li> <li>- Workshop on impacts of fishing including light fishing in Southeast Asia</li> </ul>	Mar.-Nov.  Mar.-Nov.  Aug.-Sep.	Collaboration with TUMSAT
<b>Interaction between threatened species of international concern and fisheries</b> <ul style="list-style-type: none"> <li>- Information collection on interaction of endangered species and fisheries</li> <li>- Study on the assessment of the implementation on interaction guidelines and its impact on fisheries</li> <li>- Participation of international meetings for information exchange on interaction of endangered species and fisheries</li> </ul>	Jan.-Nov.  Apr.-Nov.  Mar.-Apr.	Collaboration with NOAA
<b>Review and categorization of the compilation of fishing gear and methods in Southeast Asia</b> <ul style="list-style-type: none"> <li>- Finalization of the Myanmar Publication</li> <li>- Actual Survey and data collection in Indonesia</li> </ul>	Jan.-May. Apr.-Sep.	
<b>Production of promotion materials and technical papers</b> <ul style="list-style-type: none"> <li>- Production and dissemination of information package</li> </ul>	Jan.-Dec.	

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement (*Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses*)

**Lead Department:** Training Department

**Lead Country:**

**Total Duration:** Since 2006

**Proposed Budget:** US\$ 1000

### 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.

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. PROGRAM

#### 2.1 Objectives

- 1) To optimize the use of fishing ground through resource enhancement programs;
- 2) To enhance the fisheries resources by resource enhancement tools;
- 3) To assess the feasibility, environmental and socio-economical impact of resource enhancement tools;
- 4) To develop and design the appropriate resource enhancement tools/models;

- 5) To evaluate the impact of the fisheries resources enhancement by re-stocking programs; and
- 6) To develop human resources for the implementation of resource enhancement programs.

## **2.2 Program description**

TD will be the responsible SEAFDEC Department for this project and will manage and coordinate all project activities. Other ASEAN member countries which have been 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.

## **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

### **Experiments/Regional Workshop on the suitable designs/models of the resource enhancement tools in collaboration with the Member Countries including its evaluation and promotion.**

In order to promote the rehabilitation of fisheries resources and habitats/fishing ground through resources enhancement tools, TD was designed second version of permanent fish aggregating device so call "Fish Enhancing Device (FEDs)". The new device could be using in both coastal and off shore water. SEAFDEC/TD in cooperation program between Integrated Coastal Resource Management in Pulau Langkawi (ICRM-PL) and Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement for habitat and fishing ground development for resources enhancement was conducted a design and performance experiment test of FEDs in Pulau Langkawi, Malaysia. The training/demonstration on FEDs construction to local fishermen was conducted on 19 March 2007 at Kuala Teriang, Langkawi. After the training/demonstration, the KENs, Kuala Teriang were completed construction of 10 units of FED on the end of March 2007. Instalation of FEDs were conducted on 4 April 2007. The FEDs setting position in the zoning demarcation were determined at the Project Steering Committee meeting.

The marine physical and biological survey is one of essential tools to monitor effectiveness of the FEDs environmental and fisheries habitat changes by the installation of FEDs. Prior to the installation of the FEDs, therefore, an identical survey has to be initiated. The survey has been carried out on 20<sup>th</sup> -21<sup>st</sup> of March, 2007. The basic oceanographic parameters such as water quality, plankton, benthose (benthic fauna) and catchability of fishes were collected and investigated by available oceanographic equipments prepared by FRI Pinang staffs.

SEAFDEC/TD in cooperation with Department of Marine and Coastal Resources of Thailand was conducted a training /demonstration of FEDs in Phuket , Thailand on 21 August 2007. There are 30 local fish folk participated in the event. Installation of 50 units of FEDs are proposed to conduct on 2008 in coastal of Andaman sea.

SEAFDEC/TD staffs in collaboration with Bureau of Fisheries and Aquatic Resources (BFAR) of the Philippines was conducted demonstration/training and installation of Fish Aggregating Device (FADs) and Fish Enhancing Device (FEDs) in the Coral Garden Area of Tagalan, Aklan, Panay island, the Philippines during 22-27 February 2007. There are 5 units of FADs installed in the off shore area with water depth more than 250 m, while 10 units of FEDs were installed in shallow water, 20-70 meter depth. The consultative meeting on objectives and implementation process of the demonstration/training of FEDs the between SEAFDEC/TD staffs, BFAR officers, the Governor and Congress Man of Aklan was conducted on 22 February 2007. Both of Congress Man and the Governor are showing their highly interest of the program and proposed to expand more activities in Aklan.

Installation of 5 units of FADs were conducted by DA-BFAR research vessel on 23 February 2007. Area of installation is off shore of coral garden of the municipal waters of Tangalan, Aklan where water depth ranging from 250 to 300 m. The demonstration/training on FEDs construction and installation were conducted on 24-26 February at Tangalan. There are 40 participants from local fishermen and fisheries officers participated in the activities. Ten units of FEDs were installed in near shore area of coral garden program. Fisher folk with non-motorize engine boat from five fishing village namely Jawily, Dumatad, Afga, Baybay and Dapdap are authorize for utilization, maintenance and management of FEDs .

The monitoring survey on the Tangalan FEDs performance was conducted during 8-10 October 2007. The survey conducted on species composition observation by underwater camera/VDO record, fish abundance observation by echo-sounder, under-water observation, catching record by hand-line fishing operation, and interview to local fishermen on FEDs utilization. The preliminary result shows that local fishermen are highly appreciated on the installation of FEDs and FADs.

### Project Activities

Project/Activity Title	Duration	Remark
1. Experiments/Regional Workshop on the suitable designs/models of the resource enhancement tools in collaboration with the Member Countries including its evaluation and promotion	Feb. – Dec.	90%
2. Workshop/seminar on resource enhancement tools including artificial design and construction.	-	Propose to implement in 2010
3. Development of fisheries resources conservation and enhancing through marine ranching/re-stocking and evaluation of the impact.	-	ditto
3.1 Conservation of endangered species (dugong, whale shark, dolphin, etc.)	-	ditto
3.2 Sea ranching of selected species (sea cucumber, giant clam, sea horse, spiny lobster, abalone, etc.)	-	ditto
3.3 Restocking of indigenous species (freshwater species, shrimp, etc.)	-	ditto
3.4 Marine Protected Areas	-	ditto
4. Ecosystem evaluation: Sea-grass, mangroves, corals, soft-bottom, rivers, reservoirs, wetlands, etc.	-	ditto
5. Capacity Building on Rehabilitation of Fisheries Resources & Habitats/Fishing Grounds to Fisheries Officer of Member Countries	-	ditto
6. Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness	-	ditto

#### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

No project proposal for 2008

Second phase of project will propose to Japanese Trust Fund for implement in 2010

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses

**Lead Department:** TD

**Lead Country:**

**Duration:** 2006-2008

### 1. INTRODUCTION

Regarding fisheries resources in Southeast Asian Region is currently heavily exploited. Most of these fisheries resources were harvested in the coastal zone or offshore area where the depth of waters lesser than 100m. Consideration for the geo-topographic features in the region found that more than 50% of the sea area is classified as deep sea and most of our fishers in the region have not utilized yet. It is expected that many potential resources such as in the untrawlable areas, sea mounts, and deep sea basins are existing in the many seas in the Southeast Asian region. This is why SEAFDEC/TD proposed to identify these potential resources in cooperation with member countries. The activities will be conducted/ developed together with development of appropriate technology.

In addition, to maximize the utilization of resources as well as to reduce the post harvest losses, developing of the appropriate fish handling technology is one of the important issues to support the sustainable utilization of potential. As it was found that onboard fish handling and preservation techniques are main problems in many member countries which need to be developed. In member countries, there are different designs of fishing boat and different fish handling technologies, SEAFDEC will look for appropriate and low cost technology for fishermen to solve the problem of fish freshness/quality. Technology transfer to member countries will be one of the activities.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To 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 through development of appropriate technology.
- 2) To develop and promote capacity building for deep sea fishing in off shore areas particularly in untrawlable grounds, sea mounts, and deep sea basins.
- 3) To promote the maximum utilization of catch through better onboard fish handling to increase fish supply and improve economic return
- 4) To develop and promote capacity building for onboard fish handling technology and methods

#### 2.2 Program description

Understanding of the potential of under-utilized fisheries resources and promote their exploitation in a precautionary manner in member countries through the collaborative research program among SEAFDEC and member country will be focused/developed based on the utilization of MV SEAFDEC2 under the cost-shared policy. The preliminary results from these collaborative surveys included new findings on the potential resources will be reported to individual concerned country. At the regional point of views. Further step of the program is technology transferring of the appropriate fishing technology for harvesting of the under-utilized fisheries resources to SEAFDEC member countries, together with the technology transfer on the

appropriate onboard fish handling technology in order to reduce the post harvest losses and improving the fish quality and food safety.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

#### Project Activities

Activities	Duration	Status
<p><b>Activity 1: Workshops/ Consultation/ Visit for Data/ Information Collection</b></p> <ol style="list-style-type: none"> <li>1) Consultation visit for Research Planning of MV SEAFDEC2/ Brunei Darussalam, The Philippines and Indonesia</li> <li>2) Participation on Relevant International fora</li> <li>3) Workshop on the Progress Research Works from MV SEAFDEC2 &amp; other national findings:</li> <li>4) Regional Training on Larval Fish Identification in collaboration with UNEP-GEP</li> </ol>	Jan-Dec	80%
<p><b>Activity 2: Supporting of Actual Survey, Data Collection and Data Analysis</b></p> <ol style="list-style-type: none"> <li>1) Data Collection by MV SEAFDEC2 and National Research vessel : in Myanmar, Thailand, The Philippines ( Minanao Sea )</li> <li>2) Analysis of fish larvae, nutrients and other</li> <li>3) Develop/ modify of sampling gear and methods for data collection such as Bongo net, Nueston net</li> </ol>	Jan-Sept.	100%
<p><b>Activity 3: Develop and promote fish handling and preservation technology</b></p> <ol style="list-style-type: none"> <li>1) Observation and testing of new technology from Japanese on fish handling and preservation technology as called Liquid ice on MV SEAFDE2</li> <li>2) Develop the appropriated technology for fish handling and preservation for squid fisheries</li> <li>3) Promotion of fish handling and preservation techniques to local fishermen               <ol style="list-style-type: none"> <li>a) Thailand (Rayong Province)</li> <li>b) Cambodia (Sihanoukville)</li> </ol> </li> </ol>	Jan-Dec	80% The Onsite Training in Cambodai will be conducted in the 2 <sup>nd</sup> week of December
<p><b>Activity 4: Information Dissemination</b></p> <ol style="list-style-type: none"> <li>1) Publications on related subjects               <ul style="list-style-type: none"> <li>• Guide book for fish handling at Sea</li> <li>• Drafting the Report on under-utilized resources in untrawlable grounds in the SEA Region</li> </ul> </li> </ol>	July-Dec	50%



#### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

Activities	Duration	Remarks
<p><b>Activity 1: Workshop and Consultation</b> The Workshop for evaluation on the potential resources of some economically species on the un-trawlable grounds in the Andaman Sea will be organized. The new findings on the potential fisheries resources in the Andaman sea, relative abundance of some economically species and reporting will be discussed for further drafting of the final report.</p>	Mar-Nov.	
<p><b>Activity 2: Supporting of Actual Survey, Data Collection, Data Management System and Data Analysis</b> The collaborative research survey on potential of under-utilized resources in member countries will be conducted in cooperation with the national research program of each member country using of MV SEAFDEC2 (under the cost-shared policy for mv SEAFDEC2) or other national research vessel(s). The survey areas will be focused in the EEZ of member countries and/or trans-bordering areas particularly in un-trawlable grounds. The results from the surveys will be analyzed at the national and regional levels.</p> <p>Assist member countries on data analysis which related on the fisheries resources on un-trawlable grounds topic as supplementary information for regional analysis and findings.</p> <p>Data management system for un-trawlable fishery resources for better management in long term will be developed through the discussion with member countries during the semi-workshop.</p> <p>Human resources development for research work on un-trawlable grounds by specific fishing gears is one of the aim to transfer know-how to SEAFDEC member countries for future implementation through the ship board training/actual survey by MV SEAFDEC2 in member countries.</p>	Jan- Dec.	
<p><b>Activity 3: Develop and promote fishing and fish handling techniques for reduction of post harvest losses</b> Developing and improving of fishing techniques such as eel pot, shrimp trap, bottom longline for harvesting of under-utilized resources in the un-trawlable grounds.</p> <p>Experiment of the fish handling and preservation technique particularly high value fishes from un-trawlable grounds will be conducted on the local fishing vessel and research vessels such as mvSEAFDEC2 or others. On-site workshop to promote appropriated fishing techniques and at sea fish handling and preservation technology to the member countries related to the project will also be particularly conducted in linkage with the Se-mi workshop as mentioned in Act. 1.</p>	May-Oct.	
<p><b>Activity 4: Production of information packages</b> Information dissemination though publication and SEAFDEC web-site as are follows:</p> <ul style="list-style-type: none"> <li>• Guide book for onboard fish handling and preservation technique for squid and high value fishes</li> <li>• Potential resources of some economically species on the un-trawlable grounds in the Andaman Sea</li> </ul>	Aug-Dec	

<ul style="list-style-type: none"><li>• Guide book for responsible fishing technology: Trap, Bottom Longline and its fishing grounds in the Southeast Asian</li><li>• Others CD materials/information package</li></ul>		
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**Expected Outcomes:**

- 1) Evaluation of the potential resources of some economically species on the un-trawlable grounds in the Andaman Sea covered three countries namely Indonesia, Thailand and Myanmar through the collaborative research program using MV SEAFDEC2 and other research vessels
- 2) Development and promotion of the appropriated/responsible fishing gears and practices for harvesting of the fisheries resources on the un-trawlable grounds such as trap and bottom longline,
- 3) Workshop on potential resources of some economically species on the un-trawlable grounds in the Andaman Sea (three countries and SEAFDEC are involved)
- 4) Develop of the appropriated fish handling at sea to reduce the post-harvest losses
- 5) Human capacity building on research works concerning harvesting of fish resources on un-trawlable grounds.

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** The Use of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region

**Lead Department:** MFRDMD

**Project Duration:** 2006 - 2010

### 1. INTRODUCTION

The first phase of the project (Identification of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region) has been accomplished at the end of the year 2005. In this phase countries that had implemented the pilot projects have gained the experiences in identification of indicators for sustainable development and management of the capture fisheries. The main output is the adopted Regional Guidelines on the Use of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region. The knowledge and experience gain from the pilot projects have taken as the main inputs of the Guidelines. The follow-up actions are necessary in order to ensure that these beneficial experiences are successfully transferred and implemented in the large scale.

### 2. PROJECT

#### 2.1 Objectives

- 1) To promote the use of indicators for sustainable development and management of capture fisheries in ASEAN region.
- 2) To enhance capacity building in application of indicators for sustainable development and management of capture fisheries in ASEAN region.
- 3) To evaluate the applicability of the Regional Guidelines on use of indicators for Sustainable Development and Management of Capture Fisheries in ASEAN region

#### 2.2 Program Description

The Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region has recognized indicators as one of the reliable and practical approaches for sustainable development and management of capture fisheries in this region. SEAFDEC in collaboration with some member countries had initiated the pilot projects to identify some appropriate indicators, in 2002 to 2005. Based on the experiences in the pilot scales, the Regional Guideline on the Use of Indicators for Sustainable Development and Management of Capture Fisheries, has been developed.

In order to ensure that the use of indicators is successfully implemented to support the management of capture fisheries in this region, the follow-up actions to apply the guideline should be promoted through dissemination of this guideline to the users. The users should also be supervised and trained in implementing the guideline especially at the larger scale. In line with the need of the International Plan of Action on the Management of Fishing Capacity, special focusing will be given on development and application of indicators for management of fishing capacity.

### 3. PROGRESS

No Progress Activity

## PROJECT DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Development of Integrated Inland Fisheries Management in ASEAN Countries

**Lead Department:** SEAFDEC-MFRDMD

**Total Duration:** 2006-2010

### 1. INTRODUCTION

Preventing further decline of fishes in the inland ecosystem is fundamental to sustainable development as fish and fishing are of central importance to the lives and culture of many people who depend entirely on inland ecosystem as source of animal protein. The overriding threat to future of inland ecosystems is the impact of water management schemes for improving navigation, drainage of wetlands for flood control, construction of dams for hydroelectricity, irrigation channels for agriculture and the establishment of inter-basin connections and water transfer. Even though these changes have improved transportation, provided flood control and hydropower, and boosted agricultural output but sad to say that inland fisheries has becoming less importance in enhancing the economic well being of the country's population.

To date, there has been little effective dialogue between the fisheries sector and other agencies that are involved in sharing this inland water source and also the need to stress the importance of integrated approach in managing this limited resource. A key to optimizing benefits gained from inland water ecosystem is to promote effective dialogue and consultation between all those involved in water management as well as the users that depend on this limited resource to sustain their livelihood. In such dialogues, the importance of fisheries will be fully understood, the biology of selected certain species taken into account, and mitigation and management of impacts are regularly monitored and improved. Thus more concerted efforts are needed to manage the inland water ecosystem in an integrated approach that would benefit all users. This is a challenge to managers and users of the resources in formulating measures to contain the situation as well as sustaining the inland fisheries resources.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To develop appropriate approaches in management of inland fisheries
- 2) To develop guideline for formulating more pragmatic management plan in sustainable utilization of inland fisheries resources
- 3) To strengthen community participation in management and conservation of inland fisheries resources

#### 2.2 Program Description

The following activities are proposed:

- 1) Development of guideline for formulating management plan of inland fisheries:
  - Establish Core Working Group  
Core Working Group composed of representatives from SEAFDEC-MFRDMD, TD, and ASEAN Member Countries and from other International/ Regional Organizations dealing with Inland Fisheries such as FAO, MRC, WFC and NACA.
  - This Core Working Group will draft guideline for formulating management plan of inland fisheries

- 2) Implementation of Pilot Projects in participating countries
  - Educate local stakeholders at selected sites through regular national consultation/ seminar/ workshop/ meetings/ dialogues with clear explanation of objectives, implementation strategies and expected output of the projects. Full cooperation from the local community is to be promoted in the management and conservation of inland fisheries resources.
  - Establish frequent dialogues among the stakeholders and other user agencies.
  - The choice of the pilot sites is to be decided by the community. The local community is empowered to protect and manage the fisheries resources in their rivers or other small water bodies.
  - The local stakeholders together with staff of DoF and other relevant agencies that deal with the ecosystem will formulate suitable fisheries management plan at the respective pilot sites.
  
- 3) Human Resource Development  
Capacity building of MFRDMD staff and ASEAN Member Countries will be developed and strengthened through:
  - Training on data handling
  - Training of Trainers on Fisheries Management of Inland Fisheries
  - Attachment training at relevant competent regional/ international organizations
  
- 4) Publication and Dissemination of Information
  - Publications on guideline for formulating management plan of Inland Fisheries
  - Dissemination of pamphlets for public awareness program

### **3. PROGRESS OF ACTIVITIES IN THE YEAR 2006**

No Progress activity

## PROJECT DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Development of Technologies and Human Capacity Building for Sustainable Aquaculture

**Lead Department:** SEAFDEC Aquaculture Department (AQD)

**Lead Country:** SEAFDEC member countries

**Total Duration:** 2006-2010

**Proposed 2007 Budget:** USD 100,000

### 1. INTRODUCTION

The continuing population growth, the decline in marine fish catch, and the widespread poverty in the rural areas of the ASEAN region make it imperative that sustainable aquaculture be promoted to ensure food security and generate livelihood for the fisherfolk in the region. Recognizing this need, the Ministers of the ASEAN-SEAFDEC Member Countries responsible for fisheries declared in the Resolution, which they adopted in November 2001, that: “aquaculture production be increased in a sustainable and environment-friendly manner by ensuring a stable supply of quality seeds and feeds, effectively controlling aquatic diseases, promoting good farm management, and transferring appropriate technology.” This declaration has been clearly specified and spelled out in details in the accompanying Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region, which the Ministers also adopted in November 2001.

An initial evaluation of the outcome of the Aquaculture Component of the Special Five-year Program, implemented from 2002 to 2005, was done during the Regional Planning Meeting for the Special Five-year Program in February 2005. During the Regional Planning Meeting, the member countries considered the implementation of the Aquaculture Component a success. However, the member countries also identified specific areas that require further development. Some member countries that have ongoing activities on research and technology development for aquaculture still expressed the need for some aspects of aquaculture that should be further developed.

The Planning Workshop for the Special Five-Year Program (Aquaculture Component) 2006-2010 was conducted by AQD in Bangkok, Thailand from 30 November to 2 December 2005 in order to: develop a five-year plan of action for 2006-2010 that would address the various concerns in sustainable aquaculture development (i.e., freshwater aquaculture of indigenous species; integrated aquaculture system; coastal aquaculture and mariculture; and captive broodstock development). The Workshop participants representing the ASEAN-SEAFDEC member countries confirmed and prioritized the activities considering the limited budget for the program.

The output of the Planning Workshop was endorsed for implementation under the FCG collaborative mechanism during the 28<sup>th</sup> Meeting of the SEAFDEC Program Committee in Bangkok, Thailand in December 2005. The priority activities for 2006 were approved for implementation by the SEAFDEC Council during its 38<sup>th</sup> Meeting in Brunei Darussalam in April 2006. Specifically, the activities for 2006 were re-prioritized and the budget re-adjusted to correspond to the approved budget allocation for 2006.

Specifically, during the February 2005 Regional Planning Meeting, the member countries raised the following issues that need to be addressed: (1) consistent supply of quality seeds for various priority aquatic commodities to support the aquaculture industry in respective countries; (2) access to developed captive broodstock technology for important aquatic commodities; (3) environment-friendly culture technologies that promote socio-economic development and rural

livelihood while optimizing the utilization of resources and inputs; (4) ecologically sound farm management; (5) conservation of ecosystems and biodiversity; (6) development of low fish meal, cost-efficient and environment-friendly aquafeeds; (7) diagnosis and control of aquatic diseases; and (8) monitoring and surveillance of occurrence of aquatic diseases. Although initial efforts have been made to address certain regional aquaculture issues during the implementation of the Special Five-Year Program from 2002 to 2005, there is a need to continue the activities that have been started in order to address the aforementioned concerns.

## 2. PROGRAM

The program is intended to address regionally relevant technology needs for sustainable aquaculture in the areas of broodstock development, genetic improvement, seed production, and culture systems of various priority species for aquaculture, through research and human capacity building.

### 2.1 Objectives

- 1) Establish consistent supply of quality seeds through the establishment and promotion of captive broodstock of selected species and refinement of larval rearing techniques;
- 2) Promote ecologically sound aquaculture farm management by refining existing grow-out systems with the aim of increasing production, environmental sustainability and satisfying international trade standards;
- 3) Establish database on nutrient requirement of priority species and nutrient composition and digestibility of feed ingredients in order to develop cost-efficient feeds utilizing locally available materials that are low in fish meal and environment-friendly;
- 4) Develop the human resource in the region in sustainable aquaculture through training, farm demonstration, production of training materials like manuals and handbooks, and mobilization of experts within the region.

### 2.2 Program description

From the outcome of the February 2005 Regional Planning Meeting for the Special Five-Year Program, which were confirmed during the Planning Workshop for the Special Five-Year Program (2006-2010): Aquaculture Component held in Bangkok, Thailand, 30 November-2 December 2005, it was decided that AQD would implement the following activities from 2006 to 2010 as part of the Program on the Promotion of Sustainable Aquaculture in the ASEAN Region under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) collaborative mechanism: (i) Development of Technologies for Sustainable Aquaculture; and (ii) Human Capacity Building for Sustainable Aquaculture. The focus of the activities has been on the following: (i) freshwater aquaculture of indigenous species; (ii) Integrated aquaculture system; (iii) coastal aquaculture and mariculture; and (iv) captive broodstock development and seed production.

## 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

Starting 2007, the project “Development of Technologies for Sustainable Aquaculture” was merged with the project “Human Capacity Building for Sustainable Aquaculture”, and a new project entitled “**Development of Technologies and Human Capacity Building for Sustainable Aquaculture**” has become operational.

Project/Activity Title	Duration	Accomplishment
Freshwater Aquaculture of Indigenous Species	All year around	80 %
Integrated Aquaculture System	All year around	80 %
Coastal Aquaculture and Mariculture	All year around	70 %
Captive Broodstock Development and Seed Production	All year around	80 %

### 3.1. Freshwater Aquaculture of Indigenous Species

#### 3.1. Genetic improvement of *Macrobrachium rosenbergii*

(1) Improvement for better seed production traits and grow-out characteristics

(a) Performance of different strains of *M. rosenbergii* in grow-out culture in lake-based cages and in ponds.

- Feeding trial is being conducted as follows: Post larvae from Calumpit (Bulacan) broodstock were stocked in cages with 3 factorial designs (3-type feeds x 2-mesh sizes of cages x with or without shelter).
- Feed type and presence of shelters had no significant effects on growth and survival.
- Mesh size affected survival with higher rates in hapa cages (75%) compared with those in b-net cages (60%).
- Significantly larger prawns were also observed in hapa cages (13.2 g mean weight) compared to those in b-net cages (10.5 g).
- The number of blue-clawed males was also affected by mesh size (63 pcs for hapa vs 20 pcs for b-net).

(b) Genetic characterization of commercially important Philippine stocks of freshwater prawn, *Macrobrachium sp.*, using DNA markers

- Methods of extraction, PCR-amplification, mtDNA sequencing from wild and hatchery samples were optimized.
- Processing of samples for genetic variability analysis is 75% completed.
- Although distinct genetic differences were preliminary observed between wild and hatchery stocks, parameters estimating genetic variation can only be computed after all the samples have been analyzed.
- Conditions for mtDNA sequencing are now developed and have been optimized.
- Preliminary results of DNA sequencing showed Pampanga and Leganes individuals were taxonomically *M. r. rosenbergii* while Zambales stocks identity was *M. r. dacqueti* or an interspecific hybrid.

(2) Publication of manual on grow-out of *M. rosenbergii* in ponds and lake-based cages

The manual is in press.

### 3.2. Integrated Aquaculture System

#### 3.2.1. Rice-Fish Aquaculture

- Seven villages were selected for appropriate sites based on geographical observation.
- Local resources and living condition of the selected sites were investigated.
- The training was conducted for selected 20 farmers.
- After inspecting pond condition, silver barb, silver carp and common carp were stocked in ponds of the selected 10 farmers, according to the geographical and weather conditions.

### 3.3. Coastal Aquaculture and Mariculture

#### 3.3.1. Development of strategies to extend the spawning season of sea bass (*Lates calcarifer*) under captivity

- The construction of spawning facility and installation water heaters were completed.
- Broodstock were collected and stocked in spawning tanks.
- Reproductive condition and egg quality, if spawned, have been regularly monitored through the year.



- A trial of the year-round spawning, especially during the period of low water temperature, has started by maintaining water temperature at 28°C to 30°C.

### ***3.3.2 International training course on marine fish hatchery***

The training course was conducted in SEAFDEC/AQD (May 22 – June 28, 2007).

Funded by the GOJ-TF, the International Training Course on Marine Fish Hatchery was conducted on 22 May – 28 June 2007 at SEAFDEC/AQD with 9 participants from Thailand (2), Cambodia (1), Singapore (1) and Philippines (5). Of the 9 participants, 4 had GOJ Fellowship Grants, 1 with Thai Fellowship, 2 were self-funded, and 2 by AQD special arrangements. There were 2 females and 7 males with ages ranging from 27 to 60 years old.

The 37-day training course aimed to provide participants with basic technical knowledge and skills in operating marine fish hatcheries. At the end of the course, the participants were expected to: 1) apply broodstock management and spawning techniques; 2) produce natural food organisms; 3) produce fry, and; 4) apply appropriate engineering and biological principles in designing marine fish hatchery systems.

The participants were very much satisfied with their training as they were able to experience the larval rearing of several species of fish such as milkfish, grouper, snapper, sea bass and rabbitfish.

### ***3.3.3 International training course on abalone hatchery***

Funded by the GOJ-TF, the International Training Course on Abalone Hatchery and Grow-out was conducted on 06-25 September 2007 with 18 participants from Indonesia (1), Malaysia (2), Myanmar (1), and the Philippines (14). Of the 18 participants, 4 had GOJ-TF Fellowship Grant, 3 paying private, 11 personnel of BFAR coming from different regions, and 2 AQD staff. There were 6 females and 12 males with ages ranging from 24 to 52 years old.

The 20-day course aimed to provide participants with technical knowledge and skills on the hatchery and grow-out culture of abalone to enable them to operate and manage an abalone hatchery and grow-out.

The course was successfully completed with participants' oral presentation of the results of their hatchery activities from broodstock management, larval rearing to harvest and transport of veligers. The participants were however quite disappointed because of their aborted trip to Igang Marine Station to stock the abalone in cages for grow-out culture due to bad weather condition. Also, they were not able to observe the release of abalone at the stock enhancement project site in Anini-y for the same reason. It was suggested that this training be scheduled during summer months (April – May) so as not to encounter continuous heavy rain during the months of September and October.

### ***3.3.4 Technical assistance for pilot demonstration on mud crab grow-out culture in Myanmar***

This activity was canceled.

## **3.4. Captive Broodstock Development and Seed Production**

### ***3.4.1. Development of specific pathogen free (SPF) shrimp (*P. monodon*, *P. vannamei*) broodstock***

- (1) Genetic characterization of *P. monodon* broodstock
- Samples were collected from Bohol, Roxas and Bacolod.

- DNA were extracted and 16SmtDNA was successfully PCR-amplified.
- Processing of samples for genetic variability analysis has started.
- Preliminary observation shows genetic differences between stocks.
- Parameters estimating genetic variation can only be computed after all the samples have been analyzed.

(2) *Penaeus monodon* broodstock development: Studies on improvement of maturation of pond-reared *Penaeus monodon* broodstock

- Two batches (2 of 4 batches were pathogen-free) of young prawns (30 - 50 g) have been grown to broodstock size (80 - 100 g).
- The effects of various combinations on mating and spawning have been studied.
- 3 females from Batch 1 and 1 female from Batch 2 were matured without ablation, but spawning was achieved only after ablation.
- In tanks with the sex ratio of 1 female to 1 male, 100% were mated.
- In tanks with sex ratio of 1 female to 2 males, only 40% were mated.
- The effects of separation of males and females on % mating were studied.
- Males and females that were previously separated then mixed had % mating of 50-60% and those that were mixed from the start of culture had 67-100%.
- A total of 2 batches of F1 have been produced, but the fecundity (32,000) and hatching rate (15%) was low.
- The first batch of F1 has grown to 5-10g while the 2nd batch is still at the PL15 stage.
- The bigger juveniles from F1 batch were stocked in another tank and will later be used as broodstock when the desired size has been reached.

(3) Information exchange on status of *P. monodon* captive broodstock development in the region and the possible impact of the introduction of *P. vannamei* in the region

- Information has been collected from SEAFDEC member countries, India and Australia.

Major information is as follows:

*P. monodon* breeding program:

- Thailand, Malaysia and Philippines have on-going activities on the domestication of *P. monodon*.
- India has established facilities in the Andaman and Nicobar Is. to domesticate *P. monodon* and produce SPF and high health shrimp. F1 generation has been produced.
- Shrimp Culture Research and Development Company Ltd. had produced F6 domesticated *P. monodon*.
- Tahi Union Feed Mill formed joint venture with HH Aquaculture to produce SPF fast growing and TSV resistant shrimp nauplii and post larvae.
- In Malaysia, the performance of SPF *P. monodon* improved 50-80% in grow-out pond. Bacterial floc system is used for intensive ponds.
- In the Philippines, 2 batches of F1 have been produced.

*P. vannamei* and other exotic shrimps:

- Indonesia, Thailand, and Vietnam are into *P. vannamei* culture as an alternative to *P. monodon* since early 2000.
- In Brunei Darussalam started the culture of *P. stylirostris* in 2000.
- In USA, postlarvae are grown to broodstock size and sold to operators in Malaysia, Indonesia and Myanmar. Vietnam has also jointed the league of white shrimp producers.
- In the Philippines, the ban that prohibits the entry of exotic shrimps was lifted in 2007 hence, several shrimp growers are now growing *P. vannamei*. Occurrence of *P. vannamei* in local waters has been reported due to mass release of stocks by scared growers before the lifting of the ban, and floods.
- The collected information has been summed up and will be networked.

### 3.4.2 Domestication of Mud Crab *Scylla serrata*

- Mud crab from Catarman (Samar), Camarinas Norte, Surigao Norte and Baguey (Cagayan) were collected for genetic diversity analysis and husbandry.
- Crabs were screened for viruses: WSSV, IHHNV, GAV, YHV and TSV.
- Results of screening showed that all crabs from Camarines Norte, Samar and Surigao were negative for the five viruses.
- Crabs from Cagayan were negative for the viruses except for 2 crabs (out of 5 crabs examined) which were found to be positive for IHHNV.
- The virus negative-crabs from all the sources were selected and maintained in maturation tanks, and reproductive performance was evaluated.
- Crabs from Cagayan (7,381 zoeae/g BW female) and Camarines Norte (20 zoeae/g BW female) had one hatching each. Crabs from Samar had 7 hatching (2,267-4,759 zoeae/g BW female).
- To date, crabs from first generation are in the megalopa and juvenile stages.

#### \* Additional activities:

- Seminar workshop on stock enhancement and aquaculture of tropical species was conducted at SEAFDEC AQD on 22 November 2007, with partial financial support of the SEAFDEC Technical Support Group of Japan. Two Japanese and one Vietnamese experts, in addition to 8 AQD experts, were invited as the speakers. The seminar work shop was convened to highlight up-to-date achievements and provide a venue for the exchange of ideas and information on recent advances in seed production, stock enhancement and aquaculture of tropical species.

### List of activities which were not implemented in 2007

The following is the list of activities which were not implemented in 2007 because of the limited budget, although the activities were approved for 2006-2010, prioritized during the December 2005 Planning Workshop, endorsed for implementation by the SEAFDEC Program Committee during its 28<sup>th</sup> Meeting in December 2005, and subsequently approved by the SEAFDEC Council at its 38<sup>th</sup> Meeting in Brunei Darussalam in April 2006.

#### Activity 1: Freshwater Aquaculture of Indigenous Species

- 1.1 Genetic Improvement of *Macrobrachium rosenbergii*
  - (1) Publication of Manual on Protocols for Genetic Improvement of *M. rosenbergii*
- 1.2 Genetic Characterization of *Pangasius* spp. in member countries
  - (1) Genetic characterization of *Pangasius* spp. in member countries
  - (2) Publication of Manual on Broodstock Development of *Pangasius boucourti*
  - (3) Information exchange on progress of genetic characterization, broodstock development and seed production of *Pangasius* spp.
- 1.3 Other Indigenous Freshwater Fish Species
  - (1) Information exchange on priority indigenous species being worked on in the member countries

#### Activity 2: Integrated Aquaculture System

- 2.1 Rice-Fish Aquaculture
  - (1) Pesticide analysis on fish from rice-fish systems
- 2.2 Culture Technologies for Tilapia
  - (1) Translation of Tilapia Manuals of AQD to different languages in the region (Khmer, Lao, Vietnamese, Thai)
  - (2) Training on tilapia hatchery and grow-out for technical staff and extension officers (on-site)

#### Activity 3: Coastal Aquaculture and Mariculture

- 3.1 Grouper Seed Production
  - (1) Training on grouper (*Cromileptes altivelis*) seed production in Indonesia
  - (2) Information exchange on grouper seed production and broodstock development
- 3.2 Mud Crab Seed Production and Grow-out Culture (including fattening and soft-shell culture)

- (1) Translation of the Mud Crab Manual into the different languages in the region (Bahasa Melayu, Burmese, Khmer, Thai, Filipino)
- (2) Attachment training for representatives from ASEAN countries on mud crab aquaculture in RIA3, Vietnam
- 3.3 Seed Production and Grow-out Culture of Abalone
  - (1) Site visit to commercial grow-out abalone farms in Thailand
- 3.4 Milkfish Seed Production and Grow-out Culture
  - (1) Technical assistance for establishment of milkfish hatchery in Vietnam, Malaysia and Thailand
  - (2) Pilot demonstration for grow-out culture of milkfish in Vietnam, Malaysia and Thailand
- 3.5 Siganid Seed Production and Grow-out Culture
  - (1) Technical assistance for siganid hatchery starting with Vietnam and Myanmar
  - (2) Pilot demonstration for grow-out culture of siganids in Vietnam
- 3.6 Seaweeds
  - (1) Improvement of seaweeds strain (*Eucheuma* spp., *Kappaphycus* spp.)
- 3.7 Feeds and Nutrition for Small-scale Aquaculture
  - (2) Establishment of database on nutritional requirements of commercially important aquaculture species
  - (3) Establishment of database on composition of ingredients for aquaculture feeds
- 3.8 Seed Production and Grow-out of Cobia (*Rachycentron canadum*)
  - (1) Information exchange on status of cobia culture in the region
- 3.9 Mariculture Park (Marine Aqua-Industrial Park)
  - (1) Study visit of ASEAN representatives to Mariculture Parks in the Philippines

#### Activity 4: Captive Broodstock Development and Seed Production

- 4.2 Marine Fishes Broodstock Development
  - (1) Information exchange on marine fish (e.g., siganids, grouper, milkfish) broodstock development in the region (including transport and handling)

## 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

### 4.1. Planning of the Project activities

The following activities have been identified for implementation in 2008:

Project/Activity Title	Duration	Remarks
Improvement for better seed production traits and grow-out characteristics of <i>Macrobrachium rosenbergii</i>	All year around	
Publication of Manual for the determination of commercially important freshwater prawns	All year around	
Rice-fish aquaculture: Economic study on the fish culture production in rice fields	All year around	In Cambodia
Development of strategies to extend the spawning season of sea bass ( <i>Lates calcarifer</i> ) under captivity	All year around	
Development of tissue culture techniques for mass production of plantlets of new and improved strains of <i>Kappaphycus</i>	All year around	
Socioeconomic impact on the adoption of sustainable aquaculture technologies in fisherfolk communities	All year around	
Training course on marine fish hatchery	May-June 2008	
Training course on abalone hatchery	September 2008	
Training course on seaweed aquaculture	April 2008	

Technical assistance for pilot demonstration on mud crab grow-out culture in Myanmar	All year around	In Myanmar
Development of Specific Pathogen Free (SPF) shrimp ( <i>P. monodon</i> , <i>P. vannamei</i> ) broodstock	All year around	
Domestication of Mud Crab	All year around	

#### 4.1.1. Freshwater Aquaculture of Indigenous Species

##### *Genetic Improvement of Macrobrachium rosenbergii*

- (1) Improvement for better seed production traits and grow-out characteristics
  - (a) Domestication and genetic evaluation of the indigenous giant freshwater prawn subspecies *Macrobrachium rosenbergii rosenbergii*:
    - To evaluate and compare the reproductive performance of the two different local stocks of *M. rosenbergii rosenbergii*; and
    - To determine growth and survival of larvae and post larvae production in the two wild populations.
  - (b) Genetic characterization of commercially important Philippine stocks of freshwater prawn, *Macrobrachium sp.*, using DNA markers:
    - To continue sample pre-treatment and mtDNA-RFLP analysis of the collected samples;
    - To genetically characterize existing hatchery-bred and wild *M. rosenbergii* stocks as well as other closely related indigenous *Macrobrachium* species; and
    - To determine and compare the genetic diversity of the various freshwater prawn stocks for a baseline data for biodiversity conservation or for a genetic program in the *Macrobrachium sp.*
- (2) Publication of manual for the identification of commercially important freshwater prawns

#### 4.1.2. Integrated Aquaculture System

##### *Rice-Fish Aquaculture: Economic study on the fish culture production in rice fields (Cambodia)*

Rice-fish culture will be one of the vital small-scale aquaculture systems in Cambodia where the farmers are only engaging in rice production. It is considered as an effective aquaculture system that can be easily integrated with any kinds of rice systems. Moreover, rice-fish culture will be useful not only in increasing rice production but also in providing fish as foods and generating income to the poor households in rural areas of Cambodia. In 2007, the lecture and training of rice-fish culture were conducted for 20 selected farmers, and rice-fish culture has been practiced in ponds of the selected farmers.

In 2008, the following activities will be conducted: (i) continuation of follow-up activities with the selected farmers; (ii) introduction of rice-fish system to new farmers of other areas; and (iii) implementation of more research to get more accurate data and information in order to develop the aquaculture technology of one-year rice-fish program.

#### 4.1.3. Coastal Aquaculture and Mariculture

##### *Development of strategies to extend the spawning season of sea bass (*Lates calcarifer*) under captivity*

The stable supply of high quality fry of sea bass is highly demanded through the year. However, sea bass do not spawn during the months of November until February where the water

temperature can go below 28°C. The main objective of the study is to establish fry production technologies which can supply a stable amount of seeds through the year.

The following activities will be conducted in 2008: (i) continuation of regular monitoring of reproductive condition through the year and egg quality when fish have spawned; and (ii) continuation of trial on year-round spawning by controlling the water temperature.

***Development of tissue culture techniques for mass production of plantlets of 'new and improved' strains of Kappaphycus***

Seaweed aquaculture is a big industry in ASEAN countries. Although the Philippines is the world's leading producer of the carrageenan-bearing seaweed (*Kappaphycus*), the steady growth of seaweed production of Indonesia and Indochina is replacing the Philippine share of the market. Increase in production mainly results from the expansion of cultivation areas and not from the performance of the cultivar used. The seaweed industry is also faced with basic problems like: (1) continued declining quality of carrageenan brought by declining quality of harvested crops caused by inferior cultivars, (2) unstable biomass production, (3) vulnerability to 'ice-ice' disease and harmful endophytes, and (4) poor post-harvest management. Introduction of new and improved strains could be an effective method to solve the said problems. However, no work has been done, as yet, towards mass production of plantlets to obtain sufficient biomass for possible source of cultivars for large-scale outplanting. To establish mass-production technologies of new and improved plantlets, the following activities will be conducted in 2008: (i) adoption of the established protocols on tissue culture and mutagenesis techniques for mass production of 'new and improved' *Kappaphycus* plantlets; (ii) identification of the 'new and improved' strains of *Kappaphycus* thru genetic fingerprinting; and (iii) optimization of growth performance and biomass production of young plants from tissue culture and mutagenesis using photobioreactors and nursery tanks.

***Socioeconomic impact on the adoption of sustainable aquaculture technologies in fisherfolk communities***

Depleting fishery resources and the rising market demand for fish products have caused worldwide expansion of aquaculture. It brings food security, relieves fishing pressure, and serves as alternative or supplemental source of income to local communities. Although economic benefits from aquaculture are considerable, there are also problems associated with its development. Its intense use of aquatic resources can cause negative environmental and ecological impact. Adopting sustainable aquaculture technologies, however, could help abate the rapid degradation of resources. This study aims to analyze socio-economically the advantage of promotion of sustainable aquaculture technologies in fisherfolk communities.

The following activities will be conducted: (i) examination of the factors influencing the adoption of the technology; (ii) identification of potential conflicts and analysis of impacts on the adoption of the technology; (iii) determination of resource users' attitude towards aquaculture; and (iv) formulating recommendations on appropriate management strategies for maintaining environment integrity

***International training course on marine fish hatchery***

The course aims to provide participants with technical knowledge and skills on the spawning and larval rearing of marine fishes, such as milkfish, grouper, snapper, sea bass and rabbit fish and enable them to operate a fish hatchery or a multi-species hatchery.

### ***International training course on abalone hatchery***

The course aims to provide participants with technical knowledge and skills on seed production and grow-out culture of abalone to enable them to operate hatchery, nursery or grow-out farm of abalone.

### ***International training course on seaweed aquaculture***

Seaweed farming is a major livelihood among coastal farmers in the Southeast Asia. Over the years, SEAFDEC/AQD has developed culture techniques through biotechnology.

The course aims to provide participants with technical knowledge and skills on seaweed aquaculture. Fish farmers, technicians, researchers, policy makers, extension workers, and other interested private sectors will be invited to attend in addition to participants from Member countries.

### ***Technical assistance for pilot demonstration on mud crab grow-out culture in Myanmar***

Myanmar has considerably huge fisheries resources which support the livelihood of many coastal communities. Among these resources, mud crab (*Scylla* spp.) is one of the valuable components for local and export markets. To sustain the livelihood of the fisherfolk and strengthen the export earning of the country, mud crab culture utilizing environment-friendly technologies need to be introduced by setting-up demonstration farms. In this connection, the activities will include: (i) setting up of suitable technology for mud crab farming in Myanmar; (ii) disseminating mud crab farming technology to fisherfolk and other stakeholders through setting up of demonstration farms; and (iii) supporting livelihood programs of fisherfolk and other stakeholders.

## **4.1.4 Captive Broodstock Development and Seed Production**

### ***Development of Specific Pathogen Free (SPF) Shrimp (*P. monodon*, *P. vannamei*) Broodstock***

Many shrimp farms continue to use wild stocks, and the use of wild shrimp stocks results in unpredictable farm yields caused by inconsistent nauplii quality and source. Domestication and breeding program that considers selection for beneficial heritable traits should be implemented to improve seed and broodstock quality. This activity is composed of the following two studies.

#### **(1) Genetic characterization of *P. monodon* broodstock**

This study is aimed at a) identification of potential sources of good quality tiger shrimp broodstock and development of healthy broodstock from highly genetically variable wild stocks, and b) development of effective management and selective breeding of good quality tiger shrimp (*P. monodon*) with molecular genetic tools (marker-based data):

- To continue sample collection and DNA extraction; and
- To continue msDNA analysis for genetic variability.

#### **(2) *Penaeus monodon* broodstock development: Studies on improvement of maturation of pond-reared *Penaeus monodon* broodstock**

This study is aimed at a) producing domesticated broodstock of *P. monodon*, and b) genetically selecting the broodstock for desired heritable characteristics, particularly disease resistance while maintaining or even improving favorable inherent traits:

- Shrimps from the wild and commercial farms will be obtained and screened for the presence of WSSV, YHV, IHNV, TSV and HPV. Shrimps will be grown to broodstock size;
- Females and males from various families will be matched and stocked, and the reproductive performance will be evaluated;
- Artificial feeds and natural food will be tested and compared in terms of effect on reproductive performance and survival; and
- Nauplii (F1) from the different spawners will be reared and screened for diseases, and postlarvae will be reared in ponds and grown to marketable then to broodstock size.

(3) Information exchange on status of *P. monodon* captive broodstock development in the region and the possible impact of the introduction of *P. vannamei* in the region

- Collection of information on the said matters will be continued.
- The collected information will be summed up and networked.

### **Domestication of Mud Crab *Scylla serrata***

In order to develop a husbandry technology for the sustainable supply of good quality captive broodstock of the mud crab *S. serrata*, the following two studies will be implemented.

(1) Genetic Characterization of *Scylla* spp. Broodstock

This study is aimed at generating baseline information on the genetic diversity of mud crab species from various sources. The information on the genetic diversity of various wild mud crab populations will serve as guide in the selection of mud crab breeders as founder stocks in the domestication program.

- Broodstock collected from different sites will be characterized through DNA analysis; and
- Samples from different generations of wild and hatchery stocks to be used in the selection/domestication program (Study 2) will be analyzed for genetic variability and signs of inbreeding across the different generations of selection.

(2) Domestication of Mud Crab

This study is aimed at a) producing domesticated broodstock of *S. serrata*, and b) genetically selecting the broodstock for desired heritable characteristics (improved breeding performance and fast growth):

- Adult mud crabs with high genetic variability identified in Study 1 will be used, and the adult will be screened for diseases;
- Under modified broodstock management protocol, reproductive performance and egg/larval quality in each stock will be assessed, and each batch of zoeae from different spawners will be screened for diseases; and
- Hatchery-produced crab instar will be reared in net cages installed in ponds until 2.0 -2.5 cm in size is attained. The top 10-20% (healthy and large) male and female crabs from each family will be grown in ponds and compared to a control line using average-sized crabs.

### **4.2 Expected Outcomes**

- 1) Reproductive and larval performance of two different strains of *Macrobrachium rosenbergii* will be evaluated for the basic data of domestication program;
- 2) Biodiversity of *Macrobrachium* species will be genetically characterized for the initial database;
- 3) A manual for the identification of commercially important freshwater prawns will be published;



- 4) Practice of the fish culture production in rice fields will be promoted (Cambodia);
- 5) Technologies of the year-round spawning of sea bass (*Lates calcarifer*) under captivity will be developed;
- 6) Tissue culture and mutagenesis techniques for mass production of 'new and improved' *Kappaphycus* plantlets will be advanced;
- 7) The promotion of sustainable aquaculture technologies will be evaluated from the view of socioeconomics;
- 8) Technologies of mud crab culture will be disseminated in Myanmar;
- 9) Technologies of abalone seed production, hatchery and nursery of marine fishes, and seaweed aquaculture which have been developed by SEAFDEC/AQD will be more disseminated in SEAFDEC member countries;
- 10) Genetic characterization of *P. monodon* of wild stock and the domestication will be promoted;
- 11) Genetic characterization of mud crab of wild stock and the domestication will be promoted.

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Quality Assurance Systems for Small and Medium-sized Fish Processing Establishments in ASEAN member countries

**Lead Department:** MFRD

**Lead Country:** Singapore

**Total Duration:** 2007-2011

**Proposed Budget:** US\$52,500 (2008)

### 1. INTRODUCTION

Many small and medium-sized fish processing establishments (SME) in ASEAN member countries find it difficult to implement quality assurance systems due to economic and technical constraints. They comprised largely of pre-processing establishments (PPE) which produce semi-processed raw materials for main processing establishments and traditional products processing establishments (TPE). PPE supply semi-processed raw materials such as shrimp, crab, squid, fish and bivalve mollusc to main fish processing establishments. The processes carried out in these establishments may include peeling, de-heading, degutting, de-skinning, cooking, picking, filleting or shucking depending on the raw materials involved. Thus, PPE can play a significant role in determining the quality and safety of raw materials and subsequently of the finished products. In the ASEAN region, traditional fish products represent a significantly large part of total fish utilization and are a major source of animal protein. As a result, these products are vitally important to food security, especially considering that most of it goes to the marginalized and poorer segments of the population. Considering the importance of these products to the diet in the ASEAN region and the importance of a safe food supply to food security, it is imperative that the TPE apply appropriate GMP/SSOP programs to assure quality and safety of these products. The program will develop quality assurance systems for these SME that incorporate GMP and SSOP as a first step towards the implementation of HACCP and help them meet safety and quality assurance requirements.

The program is proposed based on the following resolution and plan of action as endorsed at the Millennium Conference:

Resolution 14: Improve post-harvest technologies to ensure fish quality assurance and safety management systems which are appropriate for small and medium-sized enterprises in the region, taking into account the importance of traditional fish products and food security requirements.

Plan of Action C4: Develop and apply fish quality and safety management systems that ensure food safety and support the competitive position of ASEAN fish products on world markets through the implementation, validation and verification of Hazard Analysis and Critical Control Point (HACCP) based systems and improved laboratory practices, and adapting quality and safety management systems so that they may be applied to small and medium enterprises in the ASEAN region.

The program is also in line with the measure nos. 46 of the Roadmap for Integration of Fisheries Sector under the ASEAN Framework Agreement for the Integration of Priority Sectors.

## **2. PROGRAM**

### **2.1 Objectives**

- 1) To develop GMP/SSOP guidelines for Small and Medium-sized Fish Processing Establishments (SME) in ASEAN member countries.
- 2) To promote the implementation of GMP/SSOP programs in Small and Medium-sized Fish Processing Enterprises (SME) thereby assuring quality and safety of fish products in ASEAN member countries.

### **2.2 Program description**

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

Other ASEAN member countries which have been identified as core countries will be involved in implementing national projects on a cost-sharing basis to develop GMP/SSOP guidelines in PPE and TPE, and to conduct pilot projects to implement GMP/SSOP programs with commercial cooperants in their respective countries.

The program involves the development and implementation of GMP/SSOP guidelines and programs for PPE and TPE through national projects and pilot projects with commercial cooperants in participating ASEAN member countries. Manuals on GMP/SSOP guidelines will also be prepared and distributed to member countries to assist them to conduct national training programs.

The expected outputs for the program include development of GMP/SSOP guidelines for PPE and TPE, publication of manuals on GMP/SSOP guidelines to promote implementation in SME, conduct of pilot projects on GMP/SSOP implementation in SME and End-of-Activity Workshops.

Program monitoring and evaluation will include annual progress reports, regular monitoring and evaluation of the pilot projects, and End-of-Activity Workshops.

## **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

In 2007 two activities have been conducted namely, the Regional Planning Meeting (Activity 1) and Development of GMP/SSOP programs for PPE (Activity 2.1).

Activity 1: Regional Planning Meeting was successfully conducted on 20-21 Jun 2007 by MFRD in Singapore to initiate the program and plan for all the program activities i.e. national projects and pilot projects. Seven countries with PPE will develop GMP/SSOP for a total of 10 products in 2007 while all ten countries will develop GMP/SSOP in TPE for a total of 19 products in 2008. It was also agreed to conduct pilot projects with commercial cooperants to implement the various GMP/SSOP developed in the processing plants from 2009. The report of the meeting has been prepared and circulated.

Activity 2.1: Development of GMP/SSOP programs for PPE. Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam have implemented national projects to develop GMP guidelines for their respective PPE as agreed at the Regional Planning Workshop:

Country	PPE
Cambodia	Crab meat (picking)
Indonesia	Fish fillet (for surimi)
Malaysia	Shrimp peeling Fish dehead/ degut (for surimi/ otoshimi)
Myanmar	Shrimp peeling/ deheading/ sizing
Philippines	Shrimp salting (for shrimp paste) Crab meat (picking)
Thailand	Shrimp peeling
Vietnam	Shrimp deheading Cuttlefish/ squid preparation (degutting, deskinning, semi dried)

#### Program Activities in 2007:

Project/Activity Title	Duration	Remarks
<b>Activity 1: Regional Planning Meeting</b>	20 – 21 Jun 2007 (2 days)	100% accomplished
<b>Activity 2: GMP/SSOP programs for PPE</b> Activity 2.1: Development of GMP/SSOP guidelines	Jun – Dec 2007	70% accomplished

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

##### 4.1 Planning of the Program Activities

Project/Activity Title	Duration	Remarks
Activity 2.2: Publication of GMP/SSOP manual for PPE	Jan – Mar 2008	MFRD will compile and edit the GMP/SSOP developed for PPE by the seven participating countries and publish a manual on the GMP/SSOP.
Activity 2.3: End-of-Activity (EOA) Workshop	May 2008 (3 days)	MFRD will organize an EOA workshop to disseminate the results of the various national projects and the published manual on GMP/SSOP for PPE to all ASEAN member countries. At the Workshop, the countries that have conducted national projects will present the results and share their experiences and recommendations.
Activity 3: GMP/SSOP programs for TPE Activity 3.1: Development of GMP/SSOP guidelines	Apr – Dec 2008	ASEAN member countries will implement their national projects to develop GMP/SSOP for their selected TPE as agreed at the Regional Planning Meeting from Apr-Dec 08 and submit quarterly progress reports to MFRD.

## **4.2 Expected Outcomes**

It is envisaged that a manual on GMP for selected PPE will be published by MFRD by the end of the first quarter of 2008. An End-of-Activity (EOA) Workshop will then be organized and conducted by MFRD in May 2008 to disseminate the results of the developmental work on the GMP for PPE carried out by the participating countries. At the EOA workshop, the manual on GMP will be distributed and participating countries will have an opportunity to share their experiences and recommendations. The workshop will also discuss any outstanding issues pertaining to the program thus far.

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Utilization of Freshwater Fish in ASEAN Member Countries

**Lead Department:** MFRD

**Lead Country:** Singapore and Thailand

**Total Duration:** 2006-2010

**Proposed Budget:** -

### 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. However, information on these freshwater fish products are not readily available as either they are not published or are published in the local language. ASEAN member countries can assist each other to better utilize their freshwater fish resources through the exchange of such information.

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.

The program is proposed based on the following resolution and plan of action as endorsed at the Millennium Conference:

Resolution 11: Promote the maximum utilization of catch, including the reduction of discards and post-harvest losses to increase fish supply and improve economic returns.

Plan of Action C1: To introduce and provide support for the development of technologies to optimise the utilization of catch and reduce post-harvest losses, wastes and discards in industrial and small-scale fisheries and processing operations through improved processing facilities, on-board and on-shore handling, storage and distribution of fish and fishery products.

Plan of Action C2: Promote the production and preserve the diversity of traditional fish products by assisting producers to secure stable supplies of quality raw materials, to meet food safety requirements and to improve product identity, nutritive value and marketing.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To compile information and data on freshwater fish products to assist in establishing national strategies for utilization of freshwater fish resources
- 2) To assist in upgrading processing and packaging technology for freshwater fish products

#### 2.2 Program description

The program will comprise of two components i.e. a survey to compile information and data (product types, raw materials utilized, production volume, processing and packaging technology involved, etc) on freshwater fish products in ASEAN member countries, and pilot processing

studies on selected freshwater fish products to upgrade processing and packaging technology which will be conducted with regional expertise. Component 1: Survey on freshwater fish products will be implemented from 2006-2007 followed by Component 2: Upgrading processing and packaging technology for freshwater fish products from 2008-2010.

The expected outputs for the program include a Handbook on inventory of freshwater fish products, pilot processing studies and End-of-Activity Workshops.

### **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

No activities conducted in 2007 due to lack of budget

### **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008**

No activities proposed in 2008 due to lack of budget

### **Expected Outcomes**

Nil

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism  
**Program Title:** Good Laboratory Quality Management in ASEAN Member Countries  
**Lead Department:** MFRD  
**Lead Country:** Singapore  
**Total Duration:** 2006-2010  
**Proposed Budget:** -

### 1. INTRODUCTION

The harmonization of analytical methods through a network of lead laboratories in the various ASEAN member countries will enhance ASEAN as a coordinated fish-exporting bloc to importing countries such as Canada, USA, Japan and EU. This will help facilitate trade in fish and fish products within and without the ASEAN region. It will then be the onus of the ASEAN member governments to ensure that the methodologies in the other fish inspection laboratories in their respective countries are aligned with their lead laboratory. This program aims to enhance the credibility of the various fish inspection testing laboratories in the ASEAN member countries, and enable them to achieve equivalent results through their national governments support to attain ISO 17025 accreditation and participation in inter-laboratory proficiency testing programs.

The program is proposed based on the following resolution and plan of action as endorsed at the Millennium Conference:

Resolution 15: Strengthen the joint ASEAN approaches and positions on international trade in fish and fishery products indigenous to the region by harmonizing standards, criteria and guidelines; and

Plan of Action C4: Develop and apply fish quality and safety management systems that ensure food safety and support the competitive position of ASEAN fish products on world markets through the implementation, validation and verification of Hazard Analysis and Critical Control Point (HACCP) based systems and improved laboratory practices, and adapting quality and safety management systems so that they may be applied to small and medium enterprises in the ASEAN region.

Plan of Action D1: Strengthen ASEAN trade policy on fish and fishery products through regional collaboration by harmonizing product standards and sanitary measures with international standards wherever appropriate, working towards harmonised guidelines for fish inspection and quality control systems among ASEAN Member Countries, strengthening fish inspection and quality control systems with regard to food safety and exchanging information on risk analysis

Recommendation in Technical Report: To develop a regional inter-laboratory proficiency-testing program

Based on the above Resolution, Plan of Action and Recommendations, the following work program is proposed:

This program on Good Laboratory Quality Management includes the establishment of good laboratory management practices in lead regional laboratories, the validation of analytical methods for fish and fish products, the establishment of measurement of uncertainties and inter-laboratory proficiency testing programs amongst the fish inspection and technology laboratories in ASEAN.



The program will comprise of five components:

- a) Networking of lead laboratories in ASEAN
- b) Implementing good laboratory practices in lead laboratories in the region
- c) Validation of laboratory test procedures and
- d) Establishment of Measurement of Uncertainties
- e) Regional Inter-laboratory Proficiency Testing

All the components, although separate in focus, are interconnected. All laboratories in the region (and in particular those certifying products for export) need to meet laboratory quality assurance requirements found in ISO 17025. This program is designed to assist laboratories in the region to meet this standard. It would also investigate the possibility of developing a regional inter-laboratory proficiency-testing program. In addition to meeting quality assurance requirements, there should also be a validation of laboratory analytical procedures to ensure equivalency of results. Many laboratories use their own methods or procedures adopted from another country, which may not have been validated against recognized international procedures such as AOAC. This program is designed to improve aspects of laboratory practices in the region.

In the first Special 5-year Program, a network of lead fisheries post-harvest laboratories in ASEAN has been established through the ASEAN Network of Fisheries Post-Harvest Technology Centres for regional collaboration on the program items. Most of the lead laboratories in ASEAN member countries are in various stages of preparation of their laboratory Quality Management Manual and validation of methods. One regional inter-laboratory proficiency testing on heavy metal was also conducted. This program is proposed to be continued into the next 5 years to enable most laboratories to achieve ISO 17025 accreditation and to validate as many of their methods as possible. In this new phase of the program, two additional aspects have been added, namely the establishment of Measurement of Uncertainties for the laboratory test methods (a requirement for ISO17025 accreditation) and training on internal auditing of the laboratory quality system as well as technical performance.

## **2. PROGRAM**

### **2.1 Objectives**

- 1) To strengthen the network of lead laboratories in ASEAN member countries,
- 2) To implement good laboratory practices in lead laboratories in the region,
- 3) To validate laboratory test methods and establish their measurement of uncertainties,
- 4) To conduct inter-laboratory proficiency testing for lead laboratories in the region, and
- 5) To train laboratory personnel in good laboratory practices and internal auditing, and methods validation and measurement of uncertainties.

### **2.2 Program Description**

This program is made up of 7 activities as follows:

#### **Activity 1: Workshop on Methods Validation and Measurement of Uncertainties**

This 5-day Workshop comprises two training sessions back-to-back. The first is on Methods Validation which aims to train laboratory personnel to validate the methods used in their laboratory which they would like to accredit under ISO 17025, and to calculate the Limit of Detection and Limit of Quantification for each method. The second is on the Measurement of Uncertainties where laboratory personnel are trained to calculate the Measurement of Uncertainties for the methods they wish to submit for ISO 17025 accreditation. Technical

expertise from SEAFDEC member countries may be identified to assist in conducting the Workshop on a cost-sharing basis. The Workshop may be held in various member countries.

### **Activity 2: Workshop on Good Laboratory Practices and Internal Auditing**

This 5-day Workshop comprises two training sessions back-to-back. The first is on Good Laboratory Practices which aims to enable laboratory personnel to understand the requirements of good laboratory practices for compliance with ISO 17025. The second is on Internal Auditing of a laboratory where laboratory personnel are trained to conduct internal audit of their laboratory based on ISO 17025 requirements. Technical expertise from SEAFDEC member countries may be identified to assist in conducting the Workshop on a cost-sharing basis. The Workshop may be held in various member countries.

### **Activity 3: Implementation of good laboratory practices in lead laboratories**

This activity aims to assist lead laboratories in the ASEAN member countries to prepare their Laboratory Management Manual and to implement good laboratory practices in their laboratories. MFRD will assist the laboratories in reviewing the laboratories' Laboratory Management Manuals and provide consultation on the implementation of good laboratory practices. This activity is a follow-up commitment by lead laboratories after the Workshop on Good Laboratory Practices.

### **Activity 4: Validation of laboratory methods and calculation of Measurement of Uncertainties by lead laboratories**

This activity aims to assist lead laboratories in their methods validation and calculation of the methods' measurement of uncertainties. MFRD will assist in reviewing the methods validation and calculation of measurement of uncertainties conducted by the laboratories and make recommendations where necessary. This activity is also a follow-up commitment by lead laboratories after the Workshop on Methods Validation and Measurement of Uncertainties. MFRD staff will visit lead laboratories to review their laboratory practices and set up and provide advice.

### **Activity 5: Validation of MFRD laboratory methods**

As MFRD has many methods established by Japanese experts over the years, MFRD is continually validating these methods and calculating their measurement of uncertainties. Only when these are completed then can the methods be accredited under ISO 17025.

### **Activity 6: Regional Inter-laboratory Proficiency Testing**

MFRD will conduct a regional inter-laboratory proficiency testing exercise annually on certain test methods. The objective is to enable regional lead laboratories test the competency of their staff performing the various tests and to check if their methods produce accurate results. In addition, the laboratories that pass the testing have methods that produce same results and are thus harmonized where those methods are concerned. All lead laboratories in the region will be invited to participate.

### **Activity 7: Compilation of Manual of Validated Methods used by ASEAN lead laboratories**

At the end of this program in 2010, MFRD will compile validated methods used by ASEAN lead laboratories and validated under this program. The publication will be distributed to all member countries.

### **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

No activities conducted in 2007 due to lack of budget

### **4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008**

No activities proposed in 2008 due to lack of budget

#### **Expected Outcomes**

Nil

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism  
**Program Title:** Environmental Related Tasks in Southeast Asia  
**Lead Department:** The Secretariat in collaboration with MFRD and MFRDMD  
**Lead Country:** Thailand and Malaysia  
**Total Duration:** 2003-2008 (Japan's fiscal year)  
**Proposed 2007 budget:**

### 1. INTRODUCTION

#### 1.1 Managing sharks fisheries

Considering the discussion on the conservation and management of sharks, and a symbolic species of shark, the great white shark, some species were listed in Appendix II of CITES, the ASEAN-SEAFDEC Member Countries recognize these problems on shark fisheries and their management, and are aware of the international requirement to urgently reconcile such problems in line with the "International Plan of Action for Conservation and Management of Shark (IPOA-Shark)". As endorsed by the 23<sup>rd</sup> Senior Official Meeting for ASEAN Ministers on Agriculture and Forestry, the Member Countries committed to establish their respective National Plan of Action on Sharks (NPOA-Shark) in line with the International Plan of Action for the Conservation and Management (IPOA-shark) developed by FAO, to be supported by best scientific evidence. In addition the regional study and other initiatives on shark have been published, the proceedings of the shark study entitled "Shark production, Utilization and Management in the ASEAN", has been disseminated in March 2006.

Recently at the Convention on International Trade in Endanger Species (CITES) CoP14 held in June 2007 in the Hague, Netherlands, the new draft decisions related to sharks were adopted, which composes of the implementation and effectiveness, commodity codes, species-specific reviews and recommendations, South American freshwater stingrays, capacity building, IPOA-sharks, and IUU fishing. Not only the new proposed measure has been proposed at the international fora, but also the new listing of sharks species under CITES appendices has being increased, these should be aware among the ASEAN-SEAFDEC Member Countries in the future effort when developing management activities for sharks and SEAFDEC would continue our effort to assist the Member Countries.

#### 1.2 Understanding sea cucumbers fisheries

Sea cucumber in commercial species have been taken into account as a critical issue; especially the families Holothuriidae and Stichopodidae, most of which the product supporting the international market demand. The issue has become the most popular in the international community, particularly at the Convention on International Trade in Endanger Species (CITES) CoP13 held in Bangkok (2004). The concern was made that the sea cucumbers in commercial species should included into CITES Appendices, which may give the negative impact on sea cucumber fisheries to the ASEAN and SEAFDEC Member Countries.

At the CITES CoP14, the decisions proposed by CITES Secretariat on behalf of Sea Cucumber Working Group was adopted with suggested that the recommendations by the CITES should be brought for consideration at the FAO workshop on sustainable use and management of sea cucumber fisheries to be organized from 19 to 23 November 2007, most of which the key consideration is drawn to management approach either national or regional level.

To follow up the international initiatives, SEAFDEC has organized regional consultations in order to provide the current situation of the issue at CITES. First gathering was at the

Preparatory Meeting on Environmental Related Tasks, held in Bangkok, Thailand, in October 2005. The outcomes of the meeting had submitted to the 8<sup>th</sup> Meeting of ASEAN- SEAFDEC FCG and the 38<sup>th</sup> Meeting of SEAFDEC Council held in April 2006 in Brunei Darussalam. Those meeting strongly agreed that the conduct of a regional comprehensive study on existing available data and information on sea cucumbers should be launched, and the management of sea cucumber resources should be the purview of the national fisheries competent agency.

## **2. PROGRAM**

### **2.1 Objectives**

- 1) To assist Member Countries by monitoring the issues on sharks and sea cucumbers at international level especially potential species of under CITES;
- 2) To mobilize expert consultation on addressing the development of future action plan and policy recommendation on sea cucumbers management & conservation based on the outcome of the regional study;
- 3) To assist Member Countries by providing necessary information on concerned aquatic species of under CITES,
- 4) To continuously publicize the effort of this region in conservation and management of sharks, sea turtles, and sea cucumbers.

### **2.2 Program Description**

#### **2.2.1 Managing sharks fisheries**

Currently, the Member Countries have put their efforts in formulating NPOA-sharks; Malaysia has already finalized and distributed their NPOA for the Conservation and Management of Sharks in 2006, while Brunei Darussalam, Myanmar, Indonesia, and Thailand have finished their draft NPOA, the rest countries are in developing process. In order to maintain the momentum of conservation and management of sharks, SEAFDEC will monitor the progress development of NPOA-sharks and facilitate in term of technical guidance for the Member Countries. As far as the proposed shark listing species under CITES has being raised by global communities, SEAFDEC will also pay attention on the issue at the international level and when appropriate informing the Member Countries.

#### **2.2.2 Understanding sea cucumbers fisheries**

Concerning with the Sea Cucumber Fisheries, the issue of sea cucumber was pending for discussion from the CITES COP-13 to COP-14 due to unavailability of a discussion document on biological and trade status of sea cucumbers. In ASEAN Region, sea cucumbers nonetheless have clearly represented an important fisheries; lack of attention to the management of these species; and their fisheries status is unknown. Along this line the Member Countries, at the ASEAN-SEAFDEC Regional Technical Consultation on International Fisheries Related Issues on 18 September 2006, in Phuket, Thailand, reaffirmed the directions provided by the Council at the 38<sup>th</sup> Meeting and support the conduct of regional study on sea cucumbers fisheries, utilization and trade in Southeast Asian Region.

Along line with previous initiatives and policy directions made by SEAFDEC Councils, the Secretariat will continue its effort in executing activities related to regional study on sea cucumbers as well as monitoring these issues under the international movement particularly commercially-exploited species under the concerned of CITES, for further properly integrated into regional plan. It is expected that outcomes of the regional study on sea cucumber fisheries, utilization and trade will be submitted to the 40<sup>th</sup> Meeting of SEAFDEC Council and the 16<sup>th</sup> Meeting of the ASWGF for their consideration and support.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

#### Project Activities

Project/Activity Title	Duration	Remarks
1. Monitoring Progress of Development NPOA-sharks and Regional Study on Sea Cucumbers	2007	Vietnam, the Philippines, Cambodia are in developing process
2. Regional Expert Meeting on Sea Cucumbers	-	No progress
3. Regional Synthesis on Sea Cucumbers	-	On-going
4. Participation to other Relevant Regional/International Fora - 5 <sup>th</sup> AEG-CITES - CITES CoP14	May June	100% 100%
5. Production of Promotional Brochure and Materials for Support the Member Countries	Feb.-Nov.	100%

With the view to address and prepare the issues related to commercially exploited aquatic species at the CITES CoP-14, SEAFDEC in consultation with the Member Countries identified name of experts in the ASEAN Region to participate at the Ad-hoc Expert Advisory Panel for Assessment of Listing Proposals to CITES for Commercially-Exploited Aquatic Species held by FAO from 26 to 30 March 2007. Mr. Ahmad bin Ali from SEAFDEC MFRDMD was selected from the region to sit in the Panel. In addition, SEAFDEC also provided related information to FAO, of which pertinent to listing proposals to CITES for commercially-exploited aquatic species based on initiatives of ASEAN and SEAFDEC Member Countries.

At the 5<sup>th</sup> ASEAN Expert Group on CITES held in Singapore from 9 to 11 May 2007, SEAFDEC dispatched two representatives from the Secretariat in order to present the Progress and Status of Issues Related to Endangered Aquatic Species and CITES under ASEAN-SEAFDEC FCG Mechanism and raise the concern of fisheries sector on conservation and management of related species especially proposed listing under CITES.

Consequently, two representatives from SEAFDEC attended the CoP14 of CITES held in the Hague, Netherlands from 3 to 15 June 2007. Posters and publications related to conservation and management of aquatic endangered species, under collaboration between ASEAN-SEAFDEC Member Countries and SEAFDEC Departments, were exhibited at the Conference. Representatives of SEAFDEC were also a member of working group on sea cucumbers of the Convention in order to monitor the issues related to fisheries, provide substantive information base on SEAFDEC initiatives in collaboration with the Member Countries, as well as safeguard the regional interests.

In July 2007, SEAFDEC in close collaboration with the Member Countries namely Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Vietnam and Thailand started conducting regional study on sea cucumber fisheries, trade and utilization in Southeast Asia and also established the 'Regional Working Group on Sea Cucumber Fisheries' for planning and coordination work on status, resources utilization, management and trade in order to assess possibility in the development of country's initiative or action plan and policy recommendation. It is expected that compilation of Member Countries' desk-study will be finished at the end of December.

In supporting the Member Countries for formulation of NPOA-sharks, SEAFDEC extended technical services and facilitated arrangement of the National Action Planning Workshop for the Conservation and Management of Sharks in the Philippines from 14 to 17 November 2007. The

Workshop accomplished identification of issues, action plan, and strategies, much of which in line with the suggested content of NPOA-shark developed by SEAFDEC.

#### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1. Monitoring Progress of Development NPOA-sharks	2007	Cambodia, Philippines, Vietnam,
2. Regional Expert Meeting on Sea Cucumbers	February	-
3. Regional Synthesis on Sea Cucumbers	Feb.-Apr.	-
4. Production of Promotional Brochure and Materials for Support the Member Countries	Apr.- Dec.	-

##### 4.2 Expected Outcomes

With the view to assist and promote the development of NPOA-shark, SEAFDEC will close collaborate with the Member Countries; where the formulation of NPOA-shark is underdeveloped, in term of facilitation and providing technical service to ensure successfully formulating of NPOA-shark. Regional experts and SEAFDEC staffs could be mobilized for implementing such activities at the national level.

In order to address the issues related to ASEAN-SEAFDEC specific study at the regional level on sea cucumbers including species, utilization and trade, especially the possibility in the development of country's initiative or action plan and policy recommendation, the Regional Expert Meeting on Sea Cucumbers will be organized around February 2008. The outcome of Regional Expert Meeting, synthesis of regional study as well as policy recommendations will be submitted the 40<sup>th</sup> Meeting of SEAFDEC Council and the 16<sup>th</sup> Meeting of the ASWGFi for consideration and support.

Collected information inclusive of actions taken by SEAFDEC would be circulated in SEAFDEC newsletters and/or other new developed materials through appropriate channels to fisheries authorities of member countries in the Southeast Asia and outside the region.

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Development of Fish Disease Surveillance System

**Lead Department:** Aquaculture Department

**Lead Country:** Philippines

**Total Duration:** Five Years (2005-2009)

**Proposed 2007 Budget:** US\$143,000

### 1. INTRODUCTION

In the last two decades, aquaculture in Southeast Asia grew rapidly and contributed to the increase of food supply and well-being of the people in ASEAN region. However, due to careless health management, large number of infectious diseases emerged and the diseases are threatening sustainable aquaculture.

“The Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region” adopted by the ASEAN-SEAFDEC Senior Officials as a result of the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People”, held in Thailand in November 2001, has the following items related to fish-health issues for aquaculture in the region:

- a. Reduce the risks of negative environmental impacts, loss of biodiversity, and disease transfer by regulating the introduction and transfer of aquatic organisms in accordance with the Regional Guidelines on the Responsible Movement of Live Aquatic Animals and Plants; and
- b. Improve capabilities in the diagnosis and control of fish diseases within the region by developing technology and techniques for disease identification, reliable field-side diagnostics and harmonized diagnostic procedures, and establishing regional and international referral systems, including designation of reference laboratories and timely access to disease control experts within the region.

To counter the disease problems and to implement the above-mentioned two items of the Plan of Action, the Government of Japan funded SEAFDEC for a regional fish disease project entitled “Development of Fish Disease Inspection Methodologies for Artificially-Bred Seeds” from 2000 to 2004. The project focus was on development of diagnostic methods of important viral diseases of aquatic animals in the region. Researches on the development of standardized diagnostic methods, husbandry methods for disease control and a monitoring method for residual chemicals in aquaculture products were conducted and the outputs were disseminated to ASEAN countries. Thus, the project has paved the way for the development of the disease control and surveillance system for the region.

Various infectious diseases due to viruses, bacteria and parasites often cause high mortalities of aquatic animals cultured in the region and still give a serious impact on aquaculture production. Moreover, new diseases are emerging due to the introduction of new aquaculture species to the region. Thus, taking necessary measures against those infectious diseases is an urgent and important issue to aquaculture in the region. The most urgent issue to be tackled for the development of healthy and wholesome aquaculture is to establish the network of resources and facilities for fish health diagnosis and human capacity building in the region. Therefore, the Aquaculture Department (AQD) of the SEAFDEC has proposed to extend the former project as a renewed project entitled “Development of Fish Disease Surveillance System” for five years from 2005 to 2009.



Despite regional and international agreements and precautionary measures on transboundary movement of exotic fish and shrimps, alien species are introduced for aquaculture and disease problems continue to spread. These prove laxity in implementation of existing laws and regulations, absence of political will among concerned government agencies, or unbalanced prioritization between preservation of biodiversity and the economic gains promised by aquaculture of exotic species. Given that exotic species, and in some cases their diseases have been introduced into some parts of Southeast Asia, it is important to conduct surveillance and monitoring to know which areas are free of specific diseases. Information gathered by both passive and active surveillance will become important tools in managing aquaculture of native and exotic species.

## 2. PROGRAM

### 2.1 Objectives

The main objective of the program is to develop a surveillance system for diseases of aquatic animals in Southeast Asia through establishment of the network of resources and facilities for fish health diagnosis and human capacity building.

### 2.2 Program Description

This program consists of 4 components: (1) Research and Development (R & D) on refinement of diagnostic methods and development of new prevention methods for aquatic animal diseases, (2) Surveillance for important viral diseases of fish and shrimps in the region, and mobile clinics, (3) Training on advanced diagnostic techniques and distance-learning course, (4) Annual progress and plan meeting and international workshop on fish disease surveillance in the region.

## 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

Project/Activity Title	Duration	Remarks (% completion)
Research and Development (R & D) on refinement of diagnostic methods and development of new prevention methods for aquatic animal diseases	All year around	70
Surveillance for important viral diseases of fish and shrimps in the region, and mobile clinics	All year around	70
E-learning and Hands-on training	All year around	80
Annual progress and plan meeting of 2006 International Workshop of Fish Diseases Annual progress and plan meeting of 2007	Mar 2007 Dec 2007 Dec 2007	40

### Research and Development (R & D) on refinement of diagnostic methods and development of new prevention methods for aquatic animal diseases

This program component aims to refine established diagnostic methods for viral diseases of aquatic animals, and to develop new control prevention methods for fish diseases in the region. For example, AQD will try to develop immunological prevention methods for white spot syndrome, husbandry technique of grouper broodstock, with eggs, larvae and food fish screening for viral nervous necrosis (VNN), and prevention mechanisms of polyculture technique and probiotics.

(1) *Development of control methods for viral nervous necrosis (VNN) of marine fish*

- New batch of sea bass broodstock were screened, and 8% were found positive for the virus.
- VNN-virus for vaccination experiment is being propagated using E-11 cell line, and the vaccine is prepared by inactivating the purified VNN virus with 0.5% formalin.
- The infectious titers of the formalin-treated virus are currently being examined by cell culture assay.
- The toxicity assay of the concentration of formalin (0.1 ml of 0.5% formalin) with intraperitoneal showed non-toxic to sea bass.
- Sea bass, which will be used in the vaccination experiment, was confirmed to be VNNV and other viruses-negative.
- An infection study was conducted using VNN-negative grouper larvae, and the larvae were observed and the mortality was recorded.
- 50% mortality was observed 11 days post infection while 93% of the larvae were dead 14 days post infection; dead larvae were VNN-positive.
- Preparation of fixatives for electron microscopy is being modified.

(2) *Development of immunological preventive methods for shrimp: Immunostimulation and vaccination strategies for WSSV prevention*

- Vaccination test via intramuscular injection was conducted.
- Vaccination test via immersion was conducted.
- Both methods clearly improved survival.
- Diets containing the formalin-killed vaccine were prepared, and oral delivery of the vaccine by diets is being tested.

(3) *Epidemiology of the white spot syndrome virus (WSSV) in different shrimp (Penaeus monodon) culture techniques in the Philippines*

- Data on the occurrence of WSSV positive prawn/crab and the weather condition from 2000 to 2006 were collected and analyzed.
- Total annual prevalence of WSSV positive shrimp increased 10% in 2000 to 38% in 2006.
- The prevalence of WSSV shrimp/crab is correlated with monthly rainfall and temperature.
- A drop in temperature or rise in rainfall resulted in increased WSSV prevalence.
- Exposure to stresses could lead to WSSV infection. Exposure to temperature fluctuation of 3-4°C in 12±5 h and salinities in the lower range (<15 ppt) for shrimp culture was identified as possible stressors.

(4) *Pilot testing of the “indigenous probiotic” in grow-out shrimp ponds*

- Re-isolation and mass production of indigenous probiotic is on-going.
- Pond dikes and gates including paddlewheels were repaired.

(5) *Haemorrhage disease on cultured freshwater catfish (Pangasianodon hypophthalmus) in Mekong Delta (RIA2, Vietnam)*

- The disease fish (n=67) were sampled at 3 sites.
- Viral isolation and identification was tried, but no virus sensitive to BF-2 cell line was detected.
  - Bacterial isolation and identification was tried, and 3 species of *Aeromonas*, *Edwardsiella ictaluri* and *Clostridium* sp were detected.

## **Surveillance for important viral diseases of fish and shrimps in the region, and mobile clinics**

In this component, through the communication with national laboratories, AQD aims to establish a network of surveillance system in the region and play the role of a resource and/or reference laboratory for diagnosis of fish and shrimp viral diseases. These surveillance activities will be coordinated with “mobile clinics,” in which SEAFDEC-AQD Surveillance Team will make an on-site diagnosis and also assist in setting up a fish disease diagnostic capability/facility of SEAFDEC member countries.

### *(1) Monitoring and surveillance of transboundary pathogens in cultured shrimps and freshwater prawn*

- Samples were collected and processed: mud crab, *Penaeus monodon*, *P. indicus*, *P. merguensis*, *P. vannamei*, *Macrobrachium rosenbergii*.
- Samples were collected at Buguey, Cagayan, Laguna, Nueva Ecija (Iloilo), Negros Occidental and Oriental, and Myanmar.
- Tests were conducted for WSSV, IHHNV, TSV, GAV, YHV and IMNV
- 10% of the total samples have so far been infected with IHHNV.
- No samples were positive for other 8 viruses.
- For *M. rosenbergii*, WTD and WSSV have been monitored, and all samples were negative for both viruses.
- On the other hand, unexplained mortalities in hatchery-reared *M. rosenbergii* have been reported.
- On-site training Workshop on shrimp and prawn health management was conducted in Myanmar on 5-9 February 2007

### *(2) Surveys of giant freshwater prawn viral diseases, MrNV and XSV in Thailand (AAHRI, Thailand)*

- Wild prawn samples were collected at 3 sites.
- The samples were tested for MrNV and XSV.
- XSV not detected from all the samples, and the samples from U-bonrachathani showed MrNV positive with 7.7%.

### *(3) Survey of viral diseases of Pacific white shrimp, Litopenaeus vannamei, in Indonesia (Fish Health Research Laboratory, Indonesia)*

- Sampling was conducted in six provinces: Lampung, Banten, West Java, Central Java, East Java, Bali.
- Analysis of samples is still in progress.

### *(4) Surveillance of emerging fish viral pathogens in some Southeast Asian countries*

- Samples of common carp, koi, grass carp and silver carp were collected from Cambodia, Lao PDR, Myanmar, Philippines and Vietnam.
- No significant parasitic infestations of the gills and systemic bacterial infection were observed.
- The specimens were processed and assayed for KHV, GCHDV and SVCV.
- To date, no virus was detected from samples of Philippines and South/North Vietnam, Cambodia and Lao PDR. Sample from Myanmar is still ongoing..
- On-site training course on fish health management in Myanmar. (Jan 29 - Feb 4, 2007).
- Mobile clinic diagnostic tests on tilapia and rohu in fish farms in Myanmar indicated no significant parasitic infestation and bacterial infection.

## **E-learning and Hands-On Training**

Training course which focused on basic and advanced (e.g. DNA/RNA-based) diagnostic methods for shrimp and fish diseases has been conducted. At the end of the training course, the participants of Myanmar and Vietnam with sufficient skills will act as national trainers or core persons in the diagnosis of important diseases in their respective countries.

- On-site training Workshop on shrimp and prawn health management was conducted in Myanmar (Feb 5-9, 2007)

Funded by the Government of Japan Trust Fund (GOJ-TF) Fish Disease Project and in collaboration with Myanmar Department of Fisheries (DOF), Ministry of Livestock and Fisheries, the 7-day on-site Training Course on Fish Health Management was conducted on 29 January – 04 February 2007 in Yangon, Union of Myanmar with ten (10) participants consisting of 5 technical staff of the DOF and 5 from the private sector (fish farmers, hatchery operator, feed company staff). There were 6 females and 4 males. In addition, four observers (1 male and 3 females; 3 from the DOF and a university assistant professor) attended the course.

The course consisted of lecture sessions, practical activities and field trips to selected aquaculture sites. It aimed to provide participants with advanced knowledge, both theoretical and practical on (a) signs and epizootologies of economically-important fish diseases; (b) evaluation of fish epizooties; (c) submission of diseased fish samples for diagnosis; and (d) basic laboratory skills for detection of viral, bacterial and parasitic pathogens.

The on-site training was successfully arranged and coordinated by Dr. Gilda Lio-Po, Senior Research Specialist, along with Dr. Leobert de la Peña, both of AQD Fish Health Section.

- On-site training course on fish health management in Myanmar. (Jan 29 - Feb 4, 007).

The on-site training workshop on Shrimp and Prawn Health Management was conducted in cooperation with Myanmar Department of Fisheries, the Marine Shrimp Association of Myanmar, and SEAFDEC Aquaculture Department on a cost-sharing scheme. The course was held in Yangon, Myanmar on 05-09 February 2007 with twenty three (23) participants (11 females and 12 males) comprising of 11 fishery officers from the Department of Fisheries and 12 from the Marine Shrimp Association (MSA), an organization composed of shrimp and freshwater prawn farmers. Of the 12 MSA participants, 3 were Directors and 9 technicians.

The training workshop aimed to reach out to as many participants to introduce to them the basic principles of shrimp and prawn health management with emphasis on disease recognition using gross signs so that participants who are directly involved in shrimp/prawn farming can make use of the knowledge as a means to give support to disease surveillance and reporting from the farm level. The course was designed to encourage the participation of culturists in recognizing disease occurrence, reporting them, and gathering samples of diagnosis. It consisted of lecture sessions held at the Myanmar Fisheries Federation, laboratory exercises done at Thaketa Aquatic Animal Health and Disease Control Laboratory, and field trips to hatchery and grow-out facilities for sample collection.

This activity was coordinated by Dr. Leobert de la Peña and Senior Research Specialist Dr. Celia Lavilla-Pitogo from whom this report was taken.

- Training on Health Management and Disease Diagnosis of Shrimp and Prawn (in Vietnam) Aug 20-25, 2007

In response to the request of the National Fisheries Quality Assurance and Veterinary Directorate (NAFIQAVED) of the Ministry of Fisheries – Vietnam, an on-site training on Health Management and Disease Diagnosis of Shrimps and Prawn was held on 20-25 August 2007 at Southern Monitoring Center for Aquaculture No. 2 (RIA 2), Ho Chi Minh City with 19 official participants and 6 observers. Of the 19 participants, 8 were from NAFIQAVED, 9 from the various provincial stations of the Department of Fisheries, and 2 from Research Institute for Aquaculture No. 2.

The training was conducted in cooperation with Vietnam's Ministry of Fisheries, Research Institute for Aquaculture No. 2, and the Government of Japan Trust Fund on Fish Diseases on a cost-sharing scheme, with the latter providing travel funds of the 2 lecturers from AQD.

The course aimed to reach out to many participants, to introduce to them the basic principles of shrimp and prawn health management as well as the laboratory procedures for diagnosis.

This activity was coordinated by Dr. Leobert de la Peña and Dr. Celia Lavilla-Pitogo from whom this report was taken.

- Hands-on Training on Detection of Koi Herpesvirus and Spring Viremia of Carp Virus (in Vietnam) Aug 27-Sep 5, 2007

The Government of Japan Trust Fund Fish Disease Project at AQD in collaboration with National Fisheries Quality Assurance and Veterinary Directorate (NAFIQAVED) of the Ministry of Fisheries – Vietnam, under a cost-sharing scheme, conducted an on-site Hands-on Training on Detection of Koi Herpesvirus (KHV) and Spring Viremia of Carp Virus (SVCV) from 27 August to 05 September 2007 at Ho Chi Minh City, Vietnam. There were 16 (11 female; 5 males) official participants and 2 observers from RIA 2. Of the 16 participants, 11 were technical staff of NAFIQAVED, 3 technical staff of RIA-2, 1 from Dong Nai Province and 1 from Chi cuc Tp. Ho Chi Minh. Most of the trainees did not have much background on Fish Virology and related laboratory techniques.

The course aimed to provide participants with a comprehensive knowledge of KHV and SVCV, and to train them on basic laboratory skills for detection of KHV and SVCV through hands-on instruction. The course consisted of lectures, practical sessions and a field trip to a koi grow-out pond in Hoyen Binh Chanh, Ho Chi Minh City where the participants and Dr. Po had an impromptu meeting with the koi farmer regarding the farm's history of fish disease and mortality experiences.

This activity was coordinated by Drs. Edgar Amar and Gilda Lio-Po who also served as resource persons and from whom this report was taken.

- A text book on aquatic animal health has been edited.
- A flyer on Spring Viremia of Carp was issued.
- No activity of e-learning was planned in 2007.

#### **Annual progress and planning meeting, and International Workshop**

- Annual Meeting of 2006 was held in SEAFDEC/AQD (Mar 16, 2007).
- Annual Meeting of 2007 will be held in Bangkok (Dec 5, 2007).
- SEAFDEC International Workshop on Emerging Fish Diseases in Asia will be held in Bangkok (Dec 6 - 7, 2007)

#### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

Project/Activity Title	Duration	Remarks
Research and Development (R & D) on development of new prevention methods for aquatic animal diseases	All year around	
Surveillance for important viral diseases of fish and shrimps in the region, and mobile clinics	All year around	
Hands-on training and publication of text books/manuals	All year around	
Annual progress and planning meeting	December 2008	

##### **Research and Development (R & D) on development of new prevention methods for aquatic animal diseases**

###### *(1) Development of control methods for viral nervous necrosis (VNN) of marine fish*

To establish a management strategy to maintain a virus-free stock of the economically important fishes, the following studies will be implemented: (i) Establishment of a management strategy to maintain virus-free stocks of the economically important fishes; (ii) Development of disinfection methods of eggs; and (iii) Development of vaccination to enhance fish immune system.

###### *(2) Development of immunological preventive methods for shrimp: Immunostimulation and vaccination strategies for WSSV prevention (SEAFDEC/AQD)*

The study aims to develop immunological methods of WSSV prevention in shrimp. The activities conducted in 2007 will be continued in 2008. The oral delivery method will be especially the focus of the activities in 2008:

- For oral delivery, several vaccine carriers will be tested;
- Available commercial and experimental vaccine carriers shown to be effective in human or in other animal models will be evaluated;
- To determine the fate of the vaccine after oral administration, antigens will be detected in the target tissues by Ab-based methods and tissue changes due to vaccination by histopathology;
- Challenge trials will be conducted after each oral delivery experiment; and
- Production of recombinant vaccine will also be pursued in 2008.

###### *(3) Epidemiology of the white spot syndrome virus (WSSV) in different shrimp (Penaeus monodon) culture techniques in the Philippines (SEAFDEC/AQD)*

Through epidemiological approach, white spot shrimp virus (WSSV) prevention and management strategies will be developed. For year 2008:

- The individual and interaction effects of the different water physico-chemical parameters on WSSV occurrence will be investigated by means of tank based experiment; and
- Pond experiments to verify the effect of pond: mangrove area ratio on water quality and disease occurrence will also be done.

###### *(4) Pilot testing of the "indigenous probiotic" in grow-out shrimp ponds (SEAFDEC/AQD)*

Using probiotic is one effective way to control bacterial flora in pond for aquaculture. A test on the efficiency of the "indigenous probiotic" in preventing the outbreak luminous Vibriosis in grow-out ponds will be continued:

- Pond preparation, stocking density, feeds and feeding, water management and other aspects of operations will be closely standardized and monitored;
- Regular sampling for weight and survival, health assessment and physico-chemical parameters will be conducted;
- Statistical analyses of production data will be done;
- Production costs will be estimated including the additional costs of the “indigenous probiotic”; and
- The economics of using the “indigenous probiotic” in the production of shrimps in grow-out ponds will be evaluated.

(5) *Haemorrhage disease on cultured freshwater catfish (*Pangasianodon hypophthalmus*) in Mekong Delta (RIA2, Vietnam)*

Catfish culture in Vietnam is facing disease problems. Among them is haemorrhagic disease which occurs in all stages of the fish and all time of the year. The disease cause high mortality, up to 100% of fingerling or adult catfish. However, the pathogen of disease has not been identified.

- Studies on the pathogen agents causing the haemorrhagic disease in freshwater catfish will be continued in 2008.

(6) *Research and analysis of chemical residue in aquaculture*

This study will be conducted with the following objectives: (i) to determine the levels of chemical contaminants such as pesticide and antibiotics in marine aquaculture fish and fish products in Southeast Asia; and (ii) to determine the withdrawal period of different antibiotics currently used in cultured marine fish and shrimp.

**Surveillance for important viral diseases of fish and shrimps in the region, and mobile clinics**

(1) *Monitoring and surveillance of transboundary pathogens in cultured shrimps and freshwater prawn by AQD Shrimp Team*

This study will survey actively the disease status of cultured shrimps and prawn in selected Southeast Asian countries; specifically, for diseases notifiable to the OIE like WSSV, TSV and significant emerging diseases, and will appraise the extent of infection to support management decisions regarding movement of shrimps and prawns for aquaculture. Information gathered in this surveillance activity will be disseminated through the various training and dissemination activities of the Fish Disease Program. Research activities for Year 2008 will continue to build upon the work that started in November 2004.

The objectives of the study are to: (i) demonstrate the disease status of cultured and wild-caught crustaceans; (ii) derive from a disease management program, recommend actions for farmers and policy makers, and assessment of their effectiveness; (iii) gather data that will feed into the country's risk analysis work; (iv) strengthen capacity in fish health among staff of Fisheries Departments of SEAFDEC member countries, specifically Myanmar and Cambodia; and (v) come up with recommendations for an early warning system for known and emerging diseases.

(2) *Surveys of giant freshwater prawn viral diseases, MrNV and XSV in Thailand (AAHRI, Thailand)*

A survey of *Macrobrachium rosenbergii* nodavirus (MrNV) and extra small virus (XSV) that cause the white muscle disease (WMD) of giant freshwater prawn will be continued. Since both viruses most likely infect giant prawn larvae through vertical transmission, there is a need to

survey the sources of giant freshwater prawn brooders, wild and cultured, in order to identify the MrNV and XSV free stocks or the prevalence of the both prawn viruses in the prawn stocks.

- The prevalence of MrNV and XSV in wild and cultured broodstock will be surveyed in 2008.
- The viruses found during the surveys will be molecularly compared with other known MrNV and XSV.
- The risk factors will be assessed to prevent the disease spread.

*(3) Survey of viral diseases of Pacific white shrimp, Litopenaeus vannamei, in Indonesia (Fish Health Research Laboratory, Indonesia)*

This study is implemented to establish surveillance system of aquatic animal diseases, and to know the current status of significant viral diseases infecting *L. vannamei* cultured in Indonesia, especially caused by TSV, WSSV, IHNV, and IMNV. Ten provinces have been selected for the study, namely: East Java, Central Java, West Java, Banten, Bali, West Nusa Tenggara, Lampung, North Sumatera, South Sulawesi, and South Kalimantan.

- A survey TSV and other shrimp viral pathogens in Pacific white shrimp will be continued in Indonesia;
- The survey will be conducted in the production areas of white shrimp in the country;
- The distribution and occurrence of viral diseases of *Litopenaeus vannamei* in Indonesia as base line data to disease control and domestic movement of the shrimp will be accurately described; and
- Control for selected diseases and pathogens, particularly control program for TSV and IMNV spreading around the country, will be assessed by zoning and limiting life shrimp transportation from an infected area to uninfected ones.

*(4) Surveillance of emerging fish viral pathogens in some Southeast Asian countries (SEAFDEC/AQD)*

Monitoring of the presence of KHV, GCHDV and SVCV will be continued through in-situ samplings of affected fish during outbreaks and of carrier fish:

- Fish samples will be conducted in the Philippines, Lao PDR, Myanmar, Cambodia and Vietnam with the assistance of former trainees or with collaborating scientists;
- Detection of viral pathogens will be conducted through pathogenicity/cohabitation experiments;
- Viral presence in collected samples will be further confirmed using PCR or RT-PCR.
- Enhancement of technical expertise through hands-on training of cooperating staff on virological techniques will be made during sampling visits;
- In-situ training on fish health will be offered for fish health workers;
- Strengthening of virus laboratory facilities through provision of cell cultures and standard protocols will be pursued.

**Training (Hands-on and On-site)**

*(1) E-learning on "Principles of Health Management in Aquaculture"*

E-learning training course will be implemented in 2008.

*(2) Hands-on training/ on-site training on advanced diagnostic techniques*

Hands-on and on-site training courses focused on basic and advanced (e.g. DNA/RNA-based) diagnostic methods for shrimp and fish diseases will be conducted. At the end of the training



course, the participants from SEAFDEC member countries with sufficient skills will act as national trainers or core persons in the diagnosis of important diseases in their respective countries.

Training on Advanced Diagnostic Techniques for Important Disease of Fish and Crustaceans:

#### **Annual progress and planning meeting**

##### ***Annual Progress and Planning Meeting***

Annual Progress and Plan Meeting will be held to review the progress of research studies for 2008 and to discuss research plans and project scheme for 2009. All study leaders from the Philippines, Thailand, Indonesia and Vietnam who work under the project will attend this annual meeting. An external evaluator from Japan will also be invited to the meeting.

#### **Dissemination of output of the project**

- 1) Proceeding of International Workshop on Fish Diseases (December 2007, Bangkok) will be published.
- 2) Publications of manuals/text books/flyers will be planned.

#### **4.2 Envisaged Outcomes of the Propose Projects/Activities**

- 1) Management strategy for viral nervous necrosis (VNN) on economically important marine species will be developed.
- 2) Preventive measures for white spot syndrome (WSS) of shrimp by vaccine administration will be developed.
- 3) Epidemiological prevention and management strategies of WSSV will be developed at pond level.
- 4) The efficiency of the “indigenous probiotic” in preventing the outbreak luminous Vibriosis in grow-out ponds will be confirmed.
- 5) The pathogen of the haemorrhagic disease of freshwater catfish will be identified.
- 6) The status of chemical contamination of aquaculture products will be developed for food safety.
- 7) Updated status on prevalence of important diseases of shrimps and fishes in Southeast Asian countries will be revealed.
- 8) Proceeding of International Workshop on Fish Diseases (December 2007) and manuals on fish diseases will be published.
- 9) Project achievements on diagnosis and surveillance of aquatic animal diseases made to date will be disseminated in the ASEAN region through training courses.

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism  
**Program Title:** Chemical and Drug Residues in Fish and Fish Products in Southeast Asia  
**Lead Department:** MFRD  
**Lead Country:** Singapore  
**Total Duration:** 2004-2008  
**Proposed Budget:** US\$77,500 (2008)

### 1. INTRODUCTION

In view of the prevalence of the presence of chemical contaminants and drug residues in seafood products and the serious implications to trade and human health, there is a need to gain an understanding of current levels of such chemical and drug residues in fish and fish products, as well as building up the capacity for detection of these residues in the region. Only with this science-based knowledge and capability, then can respective countries take appropriate actions to manage the safety of such fish and fishery products. Thus this project is proposed and it is envisaged that the information obtained will be valuable to policy makers, technologists and scientists as well as extension and regulatory personnel in the fisheries sector. In addition, this project would also allow SEAFDEC to fulfill part of the recommendations and plan of actions from the Millennium Conference as well as the last Meeting on Fish Trade and the Environment in Bangkok in the area of drug residue in the shrimp and aquaculture industry.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To obtain an understanding of levels of chemical contaminants in fish and fish products and in Southeast Asia.
- 2) To transfer technology in chemical contaminant testing in the region through setting up of methodologies and human resource training.

#### 2.2 Program description

This program is made up of four components as follows:

##### **Component 1: Survey of Heavy Metals in Fish and Fish Products in Southeast Asia**

There are two activities under this component, namely Activity 1.1 “Regional survey of heavy metals in fish and fish products” and Activity 1.2 “On-site training on heavy metals”.

In Activity 1.1, regional survey on heavy metals (cadmium, lead and total mercury) in fish and fish products will be conducted in SEAFDEC member countries. Various participating regional laboratories will conduct a survey each in their respective countries. Fish and fish products that are of economical and social importance to the participating countries will be targeted. Samples will be drawn from fish and fish products will be sent to the local/collaborating laboratories where the project is conducted for analysis. The results of the survey will be deposited in the database of the Fish and Fish Products Safety Information Network.

In Activity 1.2, MFRD aims to assist in the upgrading of regional laboratory personnel skills in conducting heavy metals analysis using Atomic Absorption Spectrometry (AAS) through a series of on-site training at project sites where the analytical equipment is available for

conducting the training. On-site training will be conducted for 10-15 laboratory officers in that member country.

### **Component 2: Survey of Pesticide and PCB Residues in Fish and Fish Products**

There are two activities under this component, namely Activity 2.1 “On-site training on pesticide residue analysis” and Activity 2.2 “Regional survey of pesticide residues in fish and fish products”.

Activity 2.1 serves to upgrade the regional laboratory staff in conducting pesticide residue analysis using Gas Chromatography Mass Spectrometry (GC-MS) and to facilitate the execution of the survey under Activity 2.2. The training will be carried out in two ways. Firstly, MFRD with the assistance of an expert from Japan will conduct a regional training course in pesticide residues analysis in MFRD for the participating SEAFDEC member countries. Subsequently, on-site training will be initiated at project sites where the analytical equipment is available for conducting the training. On-site training will be conducted for 6-10 laboratory officers in that member country.

In Activity 2.2, regional survey on the pesticide residues (organochlorines) in fish and fish products will be conducted in SEAFDEC member countries. Various participating regional laboratories will conduct a survey each in their respective countries. Fish and fish products that are of economical and social importance to the participating countries will be targeted. Samples will be drawn from fish and fish products will be sent to their local/collaborating laboratories where the project is conducted for analysis. Dried products from both marine and freshwater species, as well as fish and fish products that are dried or from inland and estuarine waters and rivers will also be targeted. The results of the survey will be deposited in the database of the Fish and Fish Products Safety Information Network.

### **Component 3: Survey of Histamine Levels in Fish and Fish Products in Southeast Asia**

There are two activities under this component, namely, Activity 3.1 “Regional survey of histamine in fish and fish products” and Activity 3.2 “On-site training on histamine”.

In Activity 3.1, a regional survey on the naturally occurring toxin, histamine, in fish and fish products will be conducted in SEAFDEC member countries. Various participating regional laboratories will conduct a survey each in their respective countries. Fish and fish products made from scombroid species will be especially targeted. In the Mid-term Review Meeting held in 2007, the Meeting agreed to include the analysis of fermented fish and fish products such as prawn paste and fish sauce in the survey but it would be up to each country to decide on the type of fermented fish and fish products and to work within their allocated budget. The results of the activities will be deposited in the database of the Fish and Fish Products Safety Information Network.

In Activity 3.2, MFRD with assistance from a trainer from Department of Fisheries (DOF), Thailand will conduct on-site training courses for 6-10 laboratory personnel in member countries on histamine analysis using fluorometric and HPLC method. The objective is to upgrade the technical capability in histamine testing in the region and facilitate the execution of Activity 3.1.

### **Component 4: Survey on Drug Residues in Southeast Asian Fish and Fish Products**

There are two activities under this component namely, Activity 4.1 “Activity 4.1: Survey of chloramphenicol and nitrofurantoin in Southeast Asian fish and fish products “ and Activity 4.2 “Regional training course in seafood safety for laboratory personnel”.

In Activity 4.1, a survey on the levels of chloramphenicol and nitrofurantoin will be conducted on fish and fish products from the region. Various participating regional laboratories will conduct a survey each in their respective countries. In the Mid-term Review Meeting held in 2007, the meeting recommended that Malachite Green and leuco-Malachite Green should be included in the survey. The Meeting also agreed to obtain the samples from processing plants. The results of the activities will be deposited in the database of the Fish and Fish Products Safety Information Network.

The activity 4.2 was initiated after the 1st Planning Meeting for Japanese Trust Fund IV Projects held on 14-16 December 2004 in Singapore. The Meeting agreed that there is a need to train the laboratory personnel on the analysis of antibiotics especially the detection of prohibited drugs such as chloramphenicol and nitrofurantoin used in aquaculture farms. The training is essential for those analyses that require sophisticated instruments such as the Liquid Chromatography Tandem Mass Spectrometry (LC-MS-MS) for detection and determination. Through this regional training course, member countries can share experience and their methods to analyze certain drugs. This will facilitate the study on the withdrawal period of antibiotics used in aquaculture shrimps and fish. As discussed in the Mid-term Review Meeting, Vietnam National Fisheries Quality Assurance & Veterinary Directorate (NAFIQAVED) and MFRD would co-organized this training and an expert from laboratory would be invited to be the trainer for the 3 methods namely Chloramphenicol, Nitrofurantoin and Malachite Green using Liquid Chromatography Mass Spectrometry (LC-MS-MS) method.

### **New Activities**

In 2006, MFRD proposed to hold the JTF II Mid-Term Review Meeting in Singapore under Activity 5.1 (New). The objectives of this meeting were to announce the change of project title as well as the scope of the project to exclude the aquaculture component and to update on the progress of all activities. In 2007, MFRD propose 2 new activities, namely, Activity 5 “Publication of Report” and Activity 6 “End-of-Activity Seminar”. The final results and reports of all SEAFDEC member countries would be published and distributed under Activity 5. In Activity 6, MFRD will hold the End-of-Activity Seminar in October/November 2008. It is envisaged that all key project leaders will be invited to attend this 3-day meeting. The meeting will report on the project since the implementation in 2004, identify the challenges faced in the implementation of the project, and deliberate the future plans.

### **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

MFRD conducted six activities under this program in 2007 namely, four regional surveys on heavy metals, pesticide residues, histamine and drug residues (chloramphenicol and nitrofurantoin) under Activity 1.1, 2.2, 3.1 and 4.1 respectively, one regional workshop and one Mid-Term Review Meeting (Activity 4.2 and 5.1 respectively).

For the regional surveys on heavy metals, pesticide residues, histamine, chloramphenicol and nitrofurantoin under Activities 1.1, 2.2, 3.1 and 4.1 respectively, the participating countries and the fish species and fish products surveyed are as listed in Table 1 below.

The Activity 4.2 “Regional Workshop in Seafood Safety for Laboratory Personnel” was successfully conducted in Singapore from 2 –5 Oct 2007. The Workshop was jointly conducted by MFRD and the National Fisheries Quality Assurance & Veterinary Directorate (NAFIQAVED). A total of 8 participants from Brunei, Cambodia, Laos, Indonesia, Malaysia, Philippines, Thailand and Vietnam attended the Workshop. Mr Nguyen Anh Dung from Vietnam shared his valuable experience and covered methods including Chloramphenicol, Nitrofurantoin and Malachite Green Analysis using Liquid-Chromatography Mass-Spectrometer-Mass Spectrometry (LC-MS/MS) during the Workshop. In the course review, the participants expressed that the Workshop was very beneficial to their work.

The Activity 5.1 “JTF II Mid-Term Review Meeting” was successfully conducted in Singapore from 7 – 9 Mar 2007. The objectives of this meeting were to announce the change of project title as well as the scope of the project to exclude the aquaculture component and to update on the progress of all activities. A total of 20 participants from SEAFDEC member countries, Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand and Vietnam attended the meeting. The meeting clarified the project scope, the sampling methods and training requirements. The administrative report of the meeting was circulated to the participants on 28 March 2007.

**Table 1** Regional Surveys

Country	Species Covered for Heavy Metals (Activity 1.1)	Species Covered for Pesticide Residues (Activity 2.2)	Species Covered for Histamine (Activity 3.1)	Species Covered for Chloramphenicol & Nitrofurantoin (Activity 4.1)
Cambodia	<ul style="list-style-type: none"> <li>Frozen Iridescent Shark Catfish (<i>Pangasius hypophthalmus</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Frozen <i>Micronema micronema</i></li> </ul>	<ul style="list-style-type: none"> <li>Frozen Iridescent Shark Catfish (<i>Pangasius bocourti</i>)</li> </ul>	-
Indonesia	<ul style="list-style-type: none"> <li>Tuna (Canned, Fresh Skipjack, Baby, Yellowfin, Bluefin)</li> <li>Red Snapper</li> <li>Grouper</li> <li>Mackerel (Frigate, Barred Spanish)</li> <li>Swordfish</li> <li>Marlin (Striped, Black)</li> <li>Baramundi</li> <li>Butter Fish</li> <li>Leather jacket</li> </ul>	-	<ul style="list-style-type: none"> <li>Tuna (Canned, Frozen, Bluefin, Yellowfin, Skipjack, Baby)</li> <li>Marlin (Striped, Black)</li> <li>Swordfish</li> <li>Red Snapper</li> <li>Butterfish</li> <li>Grouper</li> <li>Leather Jacket</li> <li>Baramundi</li> </ul>	<ul style="list-style-type: none"> <li>Shrimp (<i>Penaeus monodon</i>)</li> <li>Shrimp (<i>Penaeus vannamei</i>)</li> </ul>
Malaysia	<ul style="list-style-type: none"> <li>Spanish Mackerel (<i>Scomberomorus commerson</i>)</li> <li>Chocolate Hind (<i>Cephalopholis boenack</i>)</li> <li>Cornet grouper (<i>Cephalopholis formosa</i>)</li> <li>Longfin grouper (<i>Epinephelus quoyanus</i>)</li> <li>Slender Grouper (<i>Anyperodon leucogrammicus</i>)</li> <li>Sixbar grouper (<i>Epinephelus sexfasciatus</i>)</li> <li>Squairetail coral grouper (<i>Epinephelus areolatus</i>)</li> <li>Red Snapper</li> <li>Shrimps</li> <li>Squid</li> <li>Baramundi (<i>Lates calcarifer</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Fish</li> <li>Cockle</li> <li>Bamboo Shell</li> <li>Crab</li> <li>Shrimp</li> <li>Green Mussel</li> <li>Oyster</li> </ul>	<ul style="list-style-type: none"> <li>Selected Pelagic Species</li> </ul>	<ul style="list-style-type: none"> <li>Shrimp (<i>Penaeus monodon</i>)</li> <li>Shrimp (<i>Penaeus vannamei</i>)</li> </ul>

Country	Species Covered for Heavy Metals (Activity 1.1)	Species Covered for Pesticide Residues (Activity 2.2)	Species Covered for Histamine (Activity 3.1)	Species Covered for Chloramphenicol & Nitrofurantoin (Activity 4.1)
	<ul style="list-style-type: none"> <li>Catfish (<i>Clarius batrachus</i>)</li> <li>Tilapia</li> <li>Green mussel (<i>Perna viridis</i>)</li> <li>Black Tiger shrimp (<i>Penaeus monodon</i>)</li> <li>Grouper</li> <li>Cockle (<i>Anadara granosa</i>)</li> </ul>			
Myanmar	<ul style="list-style-type: none"> <li>Tiger Prawn (<i>Penaeus monodon</i>)</li> <li>Snake Head (<i>Ophiocephalus striatus</i>)</li> <li>Striped Catfish (<i>Pangasius hypophthalmus</i>)</li> <li>Frozen Squid (<i>Loligo davauceli</i>)</li> <li>Frozen Cuttlefish (<i>Sepia</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Frozen Spanish Mackerel (<i>Scomberomorus guttatus</i>)</li> <li>Canned sardine (<i>Sardinella longiceps</i>)</li> <li>Frozen sardine (<i>Sardinella longiceps</i>)</li> <li>Dried Anchovy (<i>Stolephorus indicus</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Rohu (<i>Labeo rohita</i>)</li> <li>Frozen Prawn (<i>Macrobrachium rosenbergii</i>)</li> <li>Tilapia (<i>Tilapia nilotica</i>)</li> <li>Frozen Catfish (<i>Notopterus notopterus</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Fresh/Frozen Tiger Prawn (<i>Penaeus monodon</i>)</li> <li>Fresh/Frozen Prawn (<i>Macrobrachium rosenbergii</i>)</li> <li>Tilapia</li> <li>Carp</li> <li>Succhi</li> <li>Rohu</li> </ul>
Philippines	-	<ul style="list-style-type: none"> <li>Shrimp (<i>Penaeus monodon</i>)</li> <li>Milkfish (<i>Chanos Chanos</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Fresh/Frozen Yellowfin Tuna</li> <li>Fresh/Frozen Indian Oil Sardine</li> <li>Dried Anchovies</li> <li>Canned Tuna</li> </ul>	<ul style="list-style-type: none"> <li>Fresh frozen shrimp (<i>Penaeus monodon</i>)</li> </ul>
Thailand	<ul style="list-style-type: none"> <li>Frozen Cuttlefish (<i>Sepia spp.</i>)</li> <li>Frozen Baby Octopus (<i>Octopus spp.</i>)</li> <li>Frozen squid (<i>Loligo spp.</i>)</li> <li>Canned Skipjack Tuna (<i>Katsuwonus pelamis</i>)</li> <li>Canned Albacore Tuna (<i>Thunnus alalunga</i>)</li> <li>Canned Yellowfin Tuna (<i>Thunnus albacares</i>)</li> <li>Frozen Vannamei Shrimp (<i>Penaeus vannamei</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Setting up method</li> </ul>	<ul style="list-style-type: none"> <li>Frozen and Canned Skipjack Tuna (<i>Katsuwonus pelamis</i>)</li> <li>Dried Anchovy (<i>Stolephorus spp.</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Fresh/Frozen Tiger prawn (<i>Penaeus monodon</i>)</li> </ul>
Vietnam	<ul style="list-style-type: none"> <li>Black Tiger Shrimps (<i>Penaeus monodon</i>)</li> <li>Bigeye tuna (<i>Thunnus albacares</i>)</li> <li>Tra Catfish (<i>Pangasius hypophthalmus</i>)</li> <li>Basa Catfish</li> </ul>	<ul style="list-style-type: none"> <li>Black Tiger Shrimps (<i>Penaeus monodon</i>)</li> <li>Clam (<i>Meretrix lyrata</i>)</li> <li>Basa catfish (<i>Pangasius bocourti</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Dried anchovy</li> <li>Frozen Tuna</li> <li>Canned Tuna</li> <li>Canned Sardines</li> </ul>	<ul style="list-style-type: none"> <li>Crabs (<i>Scylla serrata</i>)</li> <li>Frozen/Frozen Boiled/ Fresh Black Tiger Shrimps (<i>Penaeus monodon</i>)</li> </ul>

Country	Species Covered for Heavy Metals (Activity 1.1)	Species Covered for Pesticide Residues (Activity 2.2)	Species Covered for Histamine (Activity 3.1)	Species Covered for Chloramphenicol & Nitrofurans (Activity 4.1)
	<i>(Pangasius bocourti)</i> • Clam ( <i>Meretrix lyrata</i> ) • Squids ( <i>Loligo edulis</i> ) • Cuttlefish ( <i>Sepia spp.</i> )	• Tra catfish ( <i>Pangasius hypophthalmus</i> ) • Tilapia ( <i>Oreochromis spp.</i> )		

### Program Activities in 2007:

Project/Activity Title	Duration	Remarks
<b>Component 1: Survey of Heavy Metals in Fish and Fish Products in Southeast Asia</b>		
Activity 1.1: Regional survey of heavy metals in fish and fish products	Jan - Dec 07	75% accomplished
Activity 1.2: On-site training on heavy metals	-	Not conducted due to budgetary constraint.
<b>Component 2: Survey of Pesticide Residues in Fish and Fish Products</b>		
Activity 2.1: On-site training on pesticide residue analysis	-	Not conducted due to budgetary constraint.
Activity 2.2: Regional survey of pesticide residues in fish and fish products	Jan - Dec 07	75% accomplished
<b>Component 3: Survey of Histamine Levels in Fish and Fish Products in Southeast Asia</b>		
Activity 3.1: Regional survey of histamine in fish and fish products	Jan - Dec 07	75% accomplished
Activity 3.2: On-site training on histamine	-	Not conducted due to budgetary constraint.
<b>Component 4: Survey on Drug Residues in Southeast Asian Fish and Fish Products</b>		
Activity 4.1: Survey of chloramphenicol and nitrofurans in Southeast Asian fish and fish products	Jan - Dec 07	75% accomplished
Activity 4.2: Regional workshop in seafood safety for laboratory personnel	2 - 5 Oct 07	100% accomplished
Activity 5.1: Mid-Term Review Meeting	7 - 9 Mar 07	100% accomplished

## 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

### 4.1 Planning of the Program Activities

Project/Activity Title	Duration	Remarks
<b>Component 1: Survey of Heavy Metals in Fish and Fish Products in Southeast Asia</b>		
Activity 1.1: Regional survey of heavy metals in fish and fish products	Jan - Dec 08	To continue with the survey for heavy metals and submit the reports to MFRD by June 2008.
Activity 1.2: On-site training on heavy metals	-	Will not be conducted due to budgetary constraint
<b>Component 2: Survey of Pesticide in Fish and Fish Products</b>		
Activity 2.1: On-site training on pesticide residue analysis	-	Will not be conducted due to budgetary constraint

Activity 2.2: Regional survey of pesticide residues in fish and fish products	Jan – Dec 08	To continue with the survey for pesticide residues and submit the reports to MFRD by June 2008.
<b>Component 3: Survey of Histamine Levels in Fish and Fish Products in Southeast Asia</b>		
Activity 3.1: Regional survey of histamine in fish and fish products	Jan - Dec 08	To continue with the survey for histamine and submit the reports to MFRD by June 2008.
Activity 3.2: On-site training on histamine	-	Will not be conducted due to budgetary constraint
<b>Component 4: Survey on Drug Residues in Southeast Asian Fish and Fish Products</b>		
Activity 4.1: Survey of chloramphenicol, nitrofurantoin and malachite green in Southeast Asian fish and fish products	Jan - Dec 08	To continue with the survey for chloramphenicol, nitrofurantoin and include malachite green (as agreed at Mid-term Review Meeting) and submit the reports to MFRD by June 2008.
Activity 4.2: Regional workshop in seafood safety for laboratory personnel	-	Will not be conducted due to budgetary constraint
<b>New Activities</b>		
Activity 5: Publication of Report	Jul – Sept 08	MFRD will collate the results and reports and publish in the Technical publication by September 2008.
Activity 6: End-of-Activity Seminar	Oct/Nov 08 (3 days)	MFRD will conduct the End-of-Activity Seminar in October/November 2008.

#### 4.2 Expected Outcomes

It is envisaged that all participating countries will complete their surveys and submit the final reports to MFRD in June 2008. For the survey results, the key project leaders of the respective activity will seek approval from their council directors before they submit to MFRD for compilation. MFRD will consolidate the reports by September 2008 into a Technical Publication and the results will be made available on the Fish and Fish Products Safety Information Website ([www.fishsafetyinfo.com](http://www.fishsafetyinfo.com)). An End-of-Activity (EOA) Seminar will be organized by MFRD in October/November 2008 where all key project leaders will be invited to attend. The seminar will report on the program since its implementation in 2004, identify the challenges faced in the implementation of the program, and deliberate future plans.



## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Research and Development (R&D) of Stock Enhancement for Species Under International Concern

**Lead Department:** Aquaculture Department

**Lead Country:** Philippines

**Total Duration:** Five Years (2005-2009)

**Proposed 2007 Budget:** US\$51,000

### 1. INTRODUCTION

Many species of marine animals are now considered threatened or endangered, because populations have been depleted by fishing, hunting, and collecting for food and trade. Among the threatened species are the sea horses, giant clams, top shell, corals, sea cucumbers, whales and dolphins, marine turtles, sharks and rays, etc. The capture, collection, trade, and utilization of these species have been regulated under the Convention on the International Trade of Endangered Species of Wild Fauna and Flora (CITES) and/or other international and national mechanisms.

Heightened public interest in environment protection and resource conservation has become an important factor in fisheries development around the world; particularly, in policy formulation for and within the fisheries sector. Public opinion has sometimes exerted unreasonable pressure and restrictions on the fishing and fish farming industries. The Southeast Asian region has a highly diverse marine fauna and flora, many of which have been traditionally used for human food and commerce. Thus, the region is easily targeted by environment-oriented groups, especially those from developed western countries that do not share the same level of dependence on marine life.

In view of the above, it is necessary for the fisheries and aquaculture sectors in Southeast Asia, including research and development organizations like SEAFDEC, to address the environmental concerns raised by international public, particularly with regard to threatened or endangered species. Thus, SEAFDEC has been undertaking the Program on Stock Enhancement for Threatened Species of International Concern. As preparatory activity of this Program, a workshop was convened in 2005 to identify threatened species for stock enhancement and assess the existing hatchery and stock enhancement technologies for the identified species.

### 2. PROGRAM

#### 2.1 Objectives

The objectives of the Program are to: (1) develop ecologically sound strategies for stock enhancement including hatchery production and release of genetically diverse and disease-free juveniles; (2) encourage participation of local communities in stock enhancement; (3) develop methods and criteria for monitoring and evaluation of stock enhancement and conservation success; and transfer the stock enhancement technologies and social strategies to the countries in the region; and (5) review past and present stock enhancement programs to conserve threatened species in Southeast Asia

#### 2.2 Program description

The Program includes the following activities: (1) Regional Workshop to review the status of stock enhancement in Southeast Asia, identify threatened species, and assess the existing technologies for such species; (2) Research on strategies for sea ranching and stock

enhancement; (3) Verification of developed and established technologies; and (4) Training and information dissemination on stock enhancement.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

#### Project Activities

Project/Activity Title	Duration	Remarks
Workshop to assess existing technology	No activity was planned in 2007.	
Research and Development on Strategies of Sea Ranching and Stock Enhancement	All year around	% of completion – 70%
Verification of developed and established technologies	All year around	% of completion – 70%
Training and information dissemination	All year around	Manual on giant clam hatchery was published in July 2007

#### 3.1 Workshop to Assess Existing Technology

No activity was planned in this category.

#### 3.2 Research and Development on Strategies of Sea Ranching and Stock Enhancement

##### (1) *Aquaculture and conservation of seahorses Hippocampus barbouri, H. comes, H. kuda*

- Artificial feeds for seahorse larvae and fry have been developed.
- Survival of total replacement of artificial diet was as follows: 0% for <1 month old fry, 20% - 90% for 1 -2 month-old and 100% for 3 month-old.
- Body size of fry fed artificial diets was only about half as those fed natural foods.
- To improve seahorse juvenile production, data on monthly parturition events, brood size and survival rates were assessed.
- Frequency of parturition and brood size were highest in *H. comes* (8-16; 1366-3566), followed by *H. barbouri* (3-7; 151-694), and *H. kuda* (0-3; 57-1520)
- Average survival rates for the first 10 days were recorded at 5-100% in *H. comes* and 33-87% in *H. barbouri*, and 3-37% and 5-74% until day 30 in *H. comes* and *H. barbouri*, respectively.

##### (2) *Seed production for stock enhancement of humphead wrasse, Cheilinus undulates*

- The application for legal collection and transportation is submitted to the CITES Committee of Philippines, since this species is a CITES-listed species.
- SEAFDEC/AQD and Palawan Aquaculture Corp. signed MOA for developing fry production technologies.

##### (3) *Behavioral studies of the donkey-ear abalone, Haliotis asinina, under laboratory conditions: implications on stock enhancement*

- A study was conducted to investigate substrate preference of juvenile abalone with combination of sand, gravel, coralline rubbles and coral skeletons. Juveniles in 1.2-2.0 cm tended to go to seaweeds at 8-35 hr after release, while juveniles in 3.0-3.5 cm went significantly to coral skeleton at 2-77 hr after release.
- Effects of post-transportation stress and period of acclimatization were investigated.

- Results showed 100% survival after 8hr-simulated transport, regardless of the size. However, after 24 hr-simulated transport, larger size juveniles showed a higher survival than smaller size juveniles.
- Effects of diet-tagging shell mark on the survival in the presence of crabs were investigated.
- There was no difference in predation by crabs between tagged and untagged abalone.
- A site assessment was conducted in Carbin Reef.
- Reef benthic characteristics showed a wide area of broken (34% - 61%) and unbroken branching coral (9% - 23%). Sandy areas were 12% - 50%.

(4) *Stock enhancement of the abalone, Haliotis asinina, in Sagay Marine Reserve*

- 10 transections were set up on the reef flat in Sagay Marine Reserve to determine the population structure of wild abalone.
- All abalone were regularly collected in each transection, monitored and returned to the respective transection.
- •Wild abalone were mostly found in transections rich in dead corals covered with epiphytic algae.
- Male to female ratio was 1:1.
- Almost 60% of both males and females are matured. Minimum size (shell length) of sexually matured males was 3.5 cm while 4.6 cm for females.

(5) *Development of techniques for sea ranching of the donkey's ear abalone Haliotis asinina*

- SEAFDEC/AQD and the Municipal Government of Anini-y signed the memorandum of agreement to implement stock enhancement study of abalone.
- Interview on economic condition and lecture on stock enhancement were conducted in Anini-y.
- Available food sources for released abalone were surveyed at releasing sites in advance. Various species of seaweeds (dominated by *Chlorophyta* and *Rhodophyta*) and seagrasses are also found in the site.
- 5,800 juveniles (3.5-4.5 cm) were released in the corals portion of Nogas Island (Anini-y) (water depth: 0.6 – 3.0 m during low tide).
- For sampling after the release, 8 x 50-m transects were laid parallel to the shoreline. A 4 x 2-m quadrat was laid along the transect line covering a total sampled area of 1,600 m<sup>2</sup>.
- Of the total 5,800 juveniles released, only 1 live released abalone was recaptured during the survey (0.0172% of the total released stocks).
- Empty shells of both the wild stocks and the released juveniles were found in the transect.

(6) *Stock enhancement of sea cucumber Holothuria scabra*

RIA3 in Vietnam:

- 300 broodstock have been collected and stocked for spawning. 55,000 juveniles (2-5 g) were produced, and 3,000 of them were released into Nha Trang Bay.

SEAFDEC/AQD-UPV:

- Potential sources of broodstock of sea cucumbers were surveyed in Guimaras island. There were only 2 adult sized *H. scabra* during night sampling.
- 21 broodstock are maintained, and at least 4 females and 8 males so far spawned.
- During spawning trials, a total of 3 spawning events took place (2 induced and 1 spontaneous spawning).
- There were 80,000 hatched larvae (Day 2) from 1st spawning, 20,000 hatched larvae from 2nd spawning, and 1.4M larvae from 3rd spawning.
- % larval survival to Day 10-12 and % metamorphosis were 52% and 54% for the 1st batch, 87% and 60% for the 2nd batch, and 91% and 26.5% for the 3rd batch.

- There are a few hundreds of juveniles (1-4 mm length).

(7) *Fisheries and seed production of the angelwing clam Pholas orientalis for the rehabilitation of depleted wild stock*

- A survey on the past and present fisheries condition of angelwing clam in Iloilo Province was conducted. It turned out that angel wing clams can be found only in Panay and Roxas City (Capiz).
- 5 transects have been sampled for clam density. Results showed that clam density ranged 1-147 individuals/m<sup>2</sup>. Mean number of clams per transect was 70 individuals or 7 individuals/m<sup>2</sup>.
- Two batches (287 and 464 batches) of broodstock were obtained, the first batch was immatured but the second was well matured, judging from the result of anatomy study.
- Artificial spawning was successfully induced by serotonin injection.
  - Salinity tolerance was studied using the immature batch.
- There were no significant differences in survival from 20 ppt to 40 ppt but significantly lower in 0 and 10 ppt.
- A feeding trial was conducted study the feeding rate of clams placed horizontally or vertically in culture tanks.
- Clams placed vertically had significantly higher feeding rate than those placed horizontally.

### 3.3. Verification of developed and established technologies

(1) *Growth and survival of hatchery-reared giant clam, Tridacna gigas, in ocean nurseries in Negros and Panay Islands*

- Stocking of 2 batches in Sagay Marine Reserve and Malalison Island has been continued from the last year, and a new batch has been newly stocked in Igang Marine Substation (Guimaras, SEAFDEC/AQD).
- Growth performance and environmental condition have been regularly monitored and compared among 3 stocking sites.
- There were no significant differences in growth rates between cages within one site.
- A significantly higher growth rate was observed in clams grown in Igang than in Sagay and Culasi (ANOVA:  $p < 0.001$ ).
- A significantly higher survival was observed in clams grown in Igang and Sagay than in Culasi (ANOVA:  $p < 0.001$ ).
- There were no significant differences in temperature, salinity and total suspended solids between sites. Depth is the only factor that differs between sites with the Igang ocean nursery situated in the shallowest and the Culasi ocean nursery in the deepest area.
- There was no significant correlation between growth rates and temperature, salinity and total suspended solids in Sagay, Culasi and Igang.
- There was no significant correlation between survival and temperature, salinity and total suspended solids in Sagay and Culasi. Survival was negatively correlated with temperature (Pearson correlation = -0.779,  $p < 0.05$ ) but not with salinity and total suspended solids in Igang.

(2) *Socioeconomic analysis of stock enhancement of abalone and giant clams in Sagay Marine Reserve in the Philippine*

- 3 types of data collection methods have been conducted: 1) survey of fisheries, 2) survey of visitors to Sagay Marine Reserve, 3) key informant interviews with abalone traders and processor-exporters.
- According to fishers report, there is scarcity of abalone catch and an average catch a day of most fishes is less than 5 kg. While, daily catch was estimated 1 - 20 kg 12 years ago.

- The fishermen have general understanding of stock enhancement, having limited knowledge and requiring training on the principles of stock enhancement.
- According to the abalone trade, all sizes of abalone were harvested and traded. In principal, fishers, middlemen, and exporters acknowledge the importance of size-selective harvest, but fishers have urgent necessity of the market of all size for cash income due to lack of other livelihood options.

### 3.4. Training and information dissemination

- Training course for stock enhancement of threatened species was not planned in 2007 due to insufficient budget. An international training related to the objectives of this program (e.g. training course of abalone hatchery) was implemented under other Trust Fund Program “Promotion of Sustainable Aquaculture in the ASEAN Region”.
- Manual on giant clam hatchery, ocean nursery and stock enhancement was published.
- Seminar workshop on stock enhancement and aquaculture of tropical species was conducted at SEAFDEC/AQD on 22 Nov 2007, with partial financial support of the SEAFDEC Technical Support Group of Japan. Two Japanese and one Vietnamese experts in addition to 8 AQD experts were invited as the speakers. The seminar workshop was convened to highlight up-to-date achievements and provide a venue for the exchange of ideas and information on recent advances in seed production, stock enhancement and aquaculture of tropical species.

## 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

### 4.1 Planning for the project activities

Project/Activity Title	Duration	Remarks
Workshop to Assess Existing Technology	No activity	
Research and Development on Strategies of Sea Ranching and Stock Enhancement	All year around	Researches on seahorse, Napoleon wrasse, abalone, giant clam, angelwing clam, sea cucumber and socio-economic study
(1) Conservation of sea horses <i>Hippocampus barbouri</i> , <i>h. comes</i> and <i>H. kuda</i>	All year around	Sea horse
(2) Seed production for stock enhancement of humthead wrasse, <i>Cheilinus undulates</i>	All year around	Napoleon wrasse
(3) Experimental release of hatchery-produced donkey’s abalone <i>Haliotis asinina</i> in Carbin Reef, Sagay Marine Reserve, Negros Occidental	All year around	abalone
(4) Stock enhancement of the abalone <i>Haliotis asinina</i> in Sagay Marine Reserve	All year around	abalone
(5) Development of sea ranching techniques for the donkey-ear abalone <i>Haliotis asinina</i> and other economically important mollusks	All year around	abalone
(6) Stock enhancement of sea cucumber <i>Holothuria scabra</i>	All year around	Sea cucumber Vietnam
(7) Fisheries and seed production of the angelwing clam <i>Phaolas orientalis</i> for the rehabilitation of depleted wild stock	All year around	Angelwing clam
(8) Growth and survival of hatchery-reared giant clams <i>Tridacna gigas</i> in Negros and Panay islands	All year around	Giant clam

(9) Socioeconomic analysis of stock enhancement of abalone and giant clams in Sagay Marine Reserve in the Philippines	All year around	Abalone and giant clam Socioeconomic study
Training and information dissemination	All year around	

### Activity 1: Workshop to Assess Existing Technology

No activity will be implemented in this category.

### Activity 2: Research and Development on the Strategies of Sea Ranching and Stock Enhancement

#### (1) Conservation of seahorses *Hippocampus barbouri*, *H. comes*, *H. kuda* (SEAFDEC/AQD)

In order to obtain sufficient amount of good quality seeds of seahorses aimed for stock enhancement, improvement of existing breeding techniques developed by AQD will be continued. The activities will include:

- Refinement of the management and feeding scheme for broodstock and larvae/fry to improve fry production technologies for stock enhancement;
- Assessment of suitable stocking sites for seahorses;
- Development of tagging techniques to monitor the fate of released stock; and
- Release of hatchery-bred juveniles into natural conditions.

#### (2) Seed production for stock enhancement of humphead wrasse, *Cheilinus undulates*

The humphead or Napoleon wrasse, *Cheilinus undulates*, is one of the largest and most valuable reef fish. It is considered threatened; hence, it is listed in the Appendix II of CITES in 2004. The breeding and artificial seed production technologies of this species will be developed in 2008;

- Broodstock management techniques will be developed, and studies on improvement of survival and growth of larvae/fry on day 0 – 14 will be started.
- Broodstock and juveniles will be collected, and growth performance will be studied under captive condition.

#### (3) Experimental release of hatchery-produced donkey's ear abalone, *Haliotis asinina*, in Carbin Reef, Sagay Marine Reserve, Negros Occidental (SEAFDEC/AQD)

Hatchery-bred abalone juvenile will be released into cages in wild conditions to determine the growth and survival under the cage-condition (in Carbin Reef, Sagay Marine Reserve, Negros Occidental);

- To determine the growth rate of shell length and body weight of released abalone juveniles under cage conditions;
- To determine the survival of released abalone under cage conditions; and
- To monitor the shell length, body weight and survival of the released abalone into cages by a monthly sampling.

#### (4) Stock enhancement of the abalone, *Haliotis asinina*, in Sagay Marine Reserve (SEAFDEC/AQD)

Hatchery-bred abalone will be released into natural conditions to assess the impact of released abalone on the wild abalone population (in Carbin Reef, Sagay):

- To conduct monthly monitoring of wild stocks of *H. asinina* in Carbin Reef for one year;

- To release hatchery-reared abalone juveniles in the study site after monitoring wild abalone population;
- To conduct monthly monitoring of both wild and hatchery-reared *H. asinina* after the release; and
- To monitor growth and survival of released *H. asinina*

(5) *Development of techniques for sea ranching of the donkey-ear abalone Haliotis asinina (SEAFDEC/AQD)*

This study aims to develop a sustainable utilization and exploitation of natural marine resources through sea ranching of donkey-ear abalone in Nogas Island, Anini-y, Antique. To develop appropriate release strategy and proper harvest or recapture techniques, the following activities will be done in 2008:

- Hatchery-bred and marked juveniles will be released into natural conditions (in Nogas Island, Anini-y, Antique);
- Released abalone will be monitored for growth and density at monthly intervals;
- Harvesting will be done one year after release to develop proper harvest or recapture techniques (i.e. size, quantity or management techniques) that will sustain the enhanced fisher; and
- Initiation of development of appropriate release strategies (i.e. suitable size, stocking density or season) for sea ranching of abalone *Haliotis asinine*.

(6) *Stock enhancement of sea cucumber Holothuria scabra (Research Institute of Aquaculture 3, Vietnam and SEAFDEC/AQD)*

Studies on development of seed production method aimed for stock enhancement will be mainly implemented in Vietnam (RIA3). Information exchange of seed production technologies will be promoted between Vietnam and SEAFDEC/AQD.

- Nursery system in pond for bigger size for release will be refined.
- Suitable release strategies for stock enhancement of sandfish will be developed.
- Technology information exchange and training on stock enhancement of sea cucumber *Holothuria scabra* will be promoted.

(7) *Fisheries and seed production of the angelwing clam Pholas orientalis for the rehabilitation of depleted wild stock*

This high demand led to indiscriminate harvesting resulting to the depletion of natural stocks of the angelwing clam *Pholas orientalis*. Seed production techniques in the hatchery should be established prior to any attempt of considering resource rehabilitation through stock enhancement. Studies on the biology and fisheries of the angelwing clam should also be conducted while developing seed production techniques:

- Technology for seed production of angelwing in the hatchery will be developed; and
- The population of angelwing clam in the area where the broodstock are being collected will be assessed.

**(c) Activity 3: Verification of developed and established technologies**

(8) *Growth and survival of hatchery-reared giant clam, Tridacna gigas, in ocean nurseries in Negros and Panay Islands*

This study aims to compare growth rates and survival of clams grown in these three different sites.

The following studies will be continued: (i) comparison of growth and survival of two sizes (10 cm and 8 cm) stocked in cages in three different sites; (ii) monitoring of temperature, salinity, turbidity, nutrients in the three sites stocked with *T. gigas*; (ii) comparison of the three habitats based on water parameters obtained; and (iii) correlation of water parameters with growth and survival of *T. gigas*.

*(9) Socioeconomic analysis of stock enhancement of abalone and giant clams in Sagay Marine Reserve in the Philippines*

The objective of this study is to determine the socioeconomic effects of stock enhancement activities being conducted in SMR located in the northern part of Negros Occidental in the Philippines; and assess the efficiency of allocation of economic and social gains to intended beneficiaries and stakeholders. To achieve this goal, the following activities are planned in 2008: (i) continuation of analysis of survey data, including *ex-ante* evaluation of estimates of appropriate costs of and benefits from stock enhancement in project sites; and (ii) conduct of seminars to present results to stakeholders in project sites.

**(d) Activity 4: Training and information dissemination**

- Stock enhancement web pages of SEAFDEC/AQD will be maintained and updated.
- Information exchange of sand fish seed production will be promoted between Vietnam and SEAFDEC/AQD.
- Some of the activities related to the objectives of this program (e.g. training course of abalone hatchery) will be implemented under other Trust Fund Program “Promotion of Sustainable Aquaculture in the ASEAN Region”.
- Some text books and manuals on stock enhancement will be planned.

**4.2 Envisaged Outcomes of the Proposed Projects/Activity**

- 1) Semi-mass production of juvenile seahorse for stock enhancement will be developed;
- 2) Survival and growth of larvae/fry in earlier stage of Napoleon wrasse will be improved;
- 3) Growth and survival of released abalone into wild conditions will be elucidated, and the impact of release of hatchery-bred abalone on the wild stock will be assessed;
- 4) Release and recapturing strategies of juvenile abalone will be developed;
- 5) The optimum environmental conditions of stocked giant clam will be suggested;
- 6) Seed production of juvenile sandfish will be refined, and optimum release technologies will be developed;
- 7) Information exchange of juvenile sandfish production will be promoted between RIA3, Vietnam and SEAFDEC/AQD;
- 8) Seed production technologies of angelwing clam will be improved, and the condition of wild stock will be assessed;
- 9) Socio-economic analyses of stock enhancement activities will be promoted, and seminars on the results to stakeholders in projects sites will be conducted.



## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Research for Stock Enhancement of Sea Turtles

**Lead Department:** MFRDMD in collaboration with TD

**Lead Country:**

**Total Duration:** 2007 - 2008

**Proposed Budget:** USD 105,000

### 1. INTRODUCTION

Southeast Asian countries had been recognized as one of major nesting sites for sea turtles in the world. These reptiles are highly migratory and most probably share waters of Southeast Asian region. In addition, regional effort should be undertaken to reduce the mortality especially due to accidental catch by fishing gears. Thus, regional cooperation among member countries in conserving sea turtles is vital to ensure their survival. Understanding the discreteness of sea turtles stocks or how the stocks relate to each other, the migration routes and their interaction to fisheries is crucial for a proper regional management of these endangered sea reptiles.

### 2. PROGRAM

#### 2.1 Objectives

The objectives of this project are:

- 1) To identify the stock /population of the green turtles in the Southeast Asian region using mtDNA sequence;
- 2) To determine the stock size of green turtle nesters at Mak Kepit beach of Terengganu, Malaysia;
- 3) To determine the migration routes and foraging habitats of sea turtles through satellite telemetry study;
- 4) To obtain the regional biological information such as nesting and foraging ground, inter-nesting interval, nesting frequency, growth rates and migration patterns of sea turtles through tagging activities;
- 5) To report on the situation of interaction between Sea turtle and fishing operation;
- 6) To compare study between the uses of Circle hook and J-hook in longline fisheries;
- 7) To promote the guidelines for reduction of sea-turtle mortality in fishing operations.

#### 2.2 Program description

This program is composed of two components including four projects and eight activities as follows:

##### **Component 1: Meeting/Workshop/Training**

###### Activity 1: The Regional Core Group Meeting on tagging and satellite telemetry research

The selected Responsible Research Officers from the participating SEAFDEC Member Countries and Resource Persons will discuss and compile the regional information on nesting and foraging grounds, migration routes, inter-nesting interval and migration patterns in the Southeast Asian region through tagging and satellite telemetry studies.

###### Activity 2: The Second Technical Consultation Meeting (2<sup>nd</sup> TCM) on the research for stock enhancement of sea turtles

The Responsible Research Officers from the participating SEAFDEC Member Countries and

Resource Persons will discuss and evaluate the achievement of project activities from the year 2005 to 2006.

## **Component 2: Research**

### **Project 1: DNA study**

#### Activity 1: Identification of the stock/population of sea turtles in the Southeast Asian region

Detection of subpopulations of sea turtles is a very essential ecological aspect to promote their conservation and enhancement because these resources-protect schemes should be made to the each population unit. In 2007, analysis of the tissue samples of green turtles will be continued. The tissue samples of hawksbill turtles will be collected at selected nesting beaches in participating SEAFDEC Member Countries.

#### Activity 2: Detection of multiple paternities for estimation of stock size of male sea turtles in a pilot nesting beach

About 300 tissue samples of green turtle hatchlings from 10 nesters in Mak Kepit beach, Redang Island of Terengganu, Malaysia will be analyzed. The microsatellite DNA marker will be used to identify each individual of the males, which mate with the nesting females during the nesting season.

### **Project 2: Sea turtle tagging and satellite telemetry**

#### Activity 1: Tagging of sea turtles

Tagging of nesters is carried out to get information of migratory routes, foraging grounds, reproductive biology and growth rates, and to estimate stock size of sea turtle resource. This information is extremely fundamental not only to conserve and enhance the sea turtle resources but also to complement its population identification study with mtDNA method. The implementation of Inconel tagging will be continued and focus at nesting sites of sea turtles in participating SEAFDEC Member Countries. The tag recovery will also be monitored to obtain information on migratory routes, foraging grounds, inter-nesting interval and nesting frequency and growth rates. The PIT Tag activity will be continued at Mak Kepit beach of Redang Island, Terengganu, Malaysia.

#### Activity 2: Satellite telemetry

Information on long-distance movement, real migratory routes and foraging grounds is very important to consider reduction of incidental catch of sea turtles. This information will provides ecological complement for population identification of sea turtles by mtDNA method. The satellite telemetry study will be done at two selected nesting sites; Malaysia (hawksbill turtle) and Vietnam (green turtle).

### **Project 3: Interaction between Sea Turtles and Fisheries**

#### Activity 1: A Research Survey on Information Collection on the Sea-turtle Mortality in Fishing Operations

With the concern on sea turtle mortality due to fisheries, collection of Information on Sea Turtle Interaction with Fishing Operation in the Southeast Asia was initiated in 2005 to determine the current status and extent of interaction between Sea turtles and fishing operation. Through questionnaires, information will be gathered in order to determine the status of pelagic longline fisheries in term of technologies and catch compositions. This is urgently needed in order to determine the impact of pelagic longline fisheries on sea turtle mortality. In addition, information will also be compiled through interview and data work sheet in major landing sites of pelagic longline fisheries such as Phuket (Thailand), Penang (Malaysia), Indonesia, Philippines and Vietnam. This information will be compiled and analyzed to observe any relationship between fishing effort, fishing grounds and the impact of fishing gears on sea turtle mortality.

### Activity 2: A Comparative Study on the Efficiency of the Circle Hook and the J-hook in Longline fishing

Experimentation on pelagic and bottom longline gears will be conducted in 2007 using research vessels, namely; MV SEAFDEC2 and MV SEAFDEC to better understand the relative impact of pelagic and bottom longline fisheries on sea turtle mortality and feasibility study of circle hook for reducing sea turtle mortality. Many research activities concerned the status of sea turtle by incidental capture and modification of fishing gears for reduction of sea turtle mortality will be investigated. Comparison/feasibility studies on the impact of J-hooks and circle hooks on sea turtle mortality in pelagic and bottom longline fisheries will be carried out.

Through the results of these studies, reduction of sea-turtle mortality in fishing operation will be promoted through workshop to commercial longliner/private sector in SEAFDEC member countries. In this respect, use of circle hook and replacing J-hook will be promoted to the fishers.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

Project/Activity Title	Duration	Remarks
<p><b>Component 1: Meeting/Workshop/Training</b> Activity 1: The Regional Core Group Meeting on tagging and satellite telemetry research.</p>	5 June 2007	<p><b>100% completed</b> The Regional Core Group Meeting was organized as a mini-symposium to overview regional tagging and satellite telemetry studies in Southeast Asia. Information on migration routes and foraging habitat of sea turtles with reference to sea turtles-fisheries interaction were compiled based on oral papers presented by SEAFDEC participating member countries and Technical Coordinators.</p>
<p>Activity 2: The Second Technical Consultation Meeting Regional Meeting on the Progress of Research for Stock Enhancement of Sea Turtles</p>	6-7 June 2007	<p><b>100% completed</b> The meeting was held in 6-7 Jun in Kuala Lumpur. Thirty participants had attended the meeting including the Responsible Technical Officers from SEAFDEC participating member countries, Technical Coordinators and Resource Persons as well as well observers. The meeting was conducted with aim to discuss results and findings of project activities under JTF IV Program (2005-2006).</p>
<p><b>Component 2: Research</b> <b>Project1: DNA Study</b> Activity 1: Identification of the stock/population of sea turtles in the Southeast Asian region.</p>	Mar-Dec 2007	<p><b>100% completed</b> Analyzing on 300 tissue samples of green turtles from 13 sampling sites in the Southeast Asian region were completed.</p> <p><b>30% completed</b></p> <p>1) Collections of tissue samples of hawksbill turtles from 15 selected sampling sites are in progress.</p> <p>2) Analyzing of 100 tissue samples of hawksbill turtles from two</p>



		<p>Pelagic Longline Fisheries was introduced to fishermen and fishing boat owners in order to support the way to reduce sea-turtle by-catch.</p> <p>3) Consultation visit and fishing gears arrangements for experiment of circle hook in comparison with j-hook on local fishing boat in Kuantan, Malaysia (23-26 July 07)</p> <p>4) Fishing trials on circle hook in bottom longline on board local fishing boat in Kuantan, Malaysia from 15-22 October 2007</p> <p>5) Media and Poster to promote Responsible pelagic longline fisheries and to provide basic information on sea-turtle interaction in fisheries and avoidance of incidental catch were produced and distributed to member countries.</p> <p>6) Preliminary Report on a comparative study on the efficiency of circle hook and J-hook in pelagic longline was prepared.</p>
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#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p><b>Component 1.</b>  <b>Meeting/Workshop/Training</b>            Activity 1: The 3<sup>rd</sup> Technical Consultation Meeting Regional Meeting on the Progress of Research for Stock Enhancement of Sea Turtles</p>	Oct 2008	<p>The Responsible Research Officers from participating SEAFDEC Member Countries and Resource Persons will be invited. The objectives of the meeting are to discuss results/findings of project activities from 2005 to 2008.</p>
<p><b>Component 2. Research</b>  <b>Project 1. DNA Study</b>            Activity 1: Identification of the stock/population of sea turtles in the Southeast Asian region.</p> <p>Activity 2: Detection of multiple paternities from estimation of stock size of male sea turtles in a pilot nesting beach.</p>	<p>Jan-Sep 2008</p> <p>Jan-Sep 2008</p>	<p>Analyzing of tissue samples of hawksbill turtles will be completed. The results on identification of stock population of green and hawksbill turtles will be presented in 3<sup>rd</sup> TCM in October 2008.</p> <p>Detection of multiple paternities from estimation of stock size of male sea turtles in a pilot nesting beach will be conducted.</p>

<p><b>Project 2. Sea turtle tagging and satellite telemetry</b> Activity 1: Tagging of sea turtles</p> <p>Activity 2: Satellite Telemetry</p>	<p>Jan-Dec 2008</p> <p>Jan-Dec 2008</p>	<p>The comprehensive information on tagging activities at the selected sampling sites of the SEAFDEC participating member countries will be presented by Responsible Technical Officers in 3<sup>rd</sup> TCM in October 2008.</p> <p>Results of satellite telemetry activities conducted at participating member countries from 2005 to 2007 will be presented during in 3<sup>rd</sup> TCM in October 2008.</p>
<p><b>Project 3. Interaction between sea turtles and fisheries</b> Activity 1: A research survey on information collection on the sea-turtle mortality in fishing operation.</p> <p>Activity 2: A comparative study on the efficiency of the circle hook and J-hook in longline fishing</p>	<p>Jan-Dec 2008</p> <p>Apr-Dec 2008</p>	<p>To better understand the relative impact of pelagic and bottom longline fisheries on the sea turtle mortality and feasibility study on using circle hook for reducing the sea turtle mortality, the fishing trails on pelagic and bottom longline fishing will be continued on board research and commercial fishing vessels in collaboration with member countries.</p> <p>The outcomes from this study such as the mitigation of sea-turtle mortality in different fishing operations such as pelagic longline, bottom longline and purse seine associated with FADs and others will be revised and promoted in SEAFDEC member countries at both regional and international levels. In additions, promotion of circle hook in longline fisheries namely pelagic longline and bottom longline will also be promoted to fishers replacing the traditional J-hook in Indonesia, Vietnam, and Brunei Darussalam (for Bottom longline only).</p>

#### 4.2 Expected Outcomes

- 1) Third Technical Consultation Meeting of Japanese Trust Fund IV project.
- 2) Publication of terminal report on Research for Stock Enhancement of Sea Turtles.
- 3) Identification of stock /population of the green and hawksbill turtles in the Southeast Asian region.
- 4) Determination of stock size of green turtle nesters at Mak Kepit beach of Terengganu, Malaysia.

- 5) Determination of stock size of male green turtles at Mak Kepit beach of Terengganu, Malaysia.
- 6) Report on interaction between sea turtle and fishing operation.
- 7) Report on comparison study between the use of Circle hook and J-hook in pelagic and bottom longline fishery.

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty

**Responsible Department:** The Training Department

**Total Duration:** 5 years (2004 – 2008)

**Proposed 2007 Budget:** USD 100,000

### 1. INTRODUCTION

The main objectives of the program are to achieve the community-based management for sustainable coastal fishery resources and to alleviate poverty in coastal communities, with particular emphasis on women's groups. As an implication of Locally Based Coastal Fishery Resource Management projects implemented in Thailand and Malaysia by the end of December 2004, it was confirmed that the capacity building of human resource should place greater emphasis on the progress to ensure the sustainable coastal resource management. The project deployed pragmatic activities to stimulate and encourage people's participation as well as to build people's capacity for involvement in coastal resource management and community development. The people's participation is an initial empowerment to contribute to the institution of a local management body to vigorously lead community development and coastal resource management. The local management body takes the function of establishing local businesses to gradually create job opportunities both inside and outside the fisheries sectors of the community. In addition, the local management body also leads to encouragement of people's participation and creation of activities in resource management to strengthen people's awareness on managing resources at local level.

The proposed program has 3 main components. Component-1 plans to follow up and strengthen the activity on people's capacity building and participation in the two on-going projects under the TF-I; i.e. ICRM-PD (ex-project LBCFM-PD) in Thailand as a sub-component 1: Project 1 and ICRM-PL (the ex-project LBCRM-PL) as a sub-component 2: Project 2 as their 2<sup>nd</sup> phases. The former project activity and the impact were evaluated in 2004, and based upon the outcome of the evaluation the project action plan was reformulated as phase II to meet the new requirements for the follow-up stages of the basic project concept from 2005 under the financial arrangement of TF-IV. The main emphasis in the phase II ICRM-PD was placed on institutional and human capacity building in the core fishermen groups throughout the remaining project term, while the one in the 2<sup>nd</sup> phase of ICRM-PL has been put on human capacity building in the deployment of integrated coastal resources management centered on the demarcated zone for community fisheries to be established by DOF Malaysia. The project ICRM-PD had been achieving expected goals toward the end of 2006 as scheduled. The project was taken over by DOF Thailand from January 2007 for the three years tenure under the financial auspices by the Royal Project and the Local Administration. The SEAFDEC/TD has been involved in this follow-up project as the capacity of an observer in a bid to ensure its sustainable execution of the project. The project ICRM-PL has been achieving expected outcomes although they suffered from the devastating tsunami assault in December 2004 and the phase-out process is on the right track. Given such a progress of the project status, the project could be terminated the SEAFDC's initiative in December 2007 as originally planned with some minor follow-up activities in 2008.

The Component 2 is the implementation stage of the component 1 concept for other member countries. Since the inception of the project operation of LBCFM-PD and LBCRM-PL in Thailand and Malaysia, respectively under TF-I, a few other member counties have proposed to commence similar CBFMR projects in their own countries within the collaboration framework with SEAFDEC/TD. In fact, four other member countries, i.e. Indonesia, Brunei Darussalam, Cambodia and Myanmar, had officially expressed their interest to initiate the similar projects



under the collaborative project arrangement before 2004. Among these countries, Cambodia was selected as the 3<sup>rd</sup> country to start up the project. The document formulation for the similar project was completed for in Cambodia entitled “Integrated Coastal Resources Management in Sihanoukville (ICRM-SV)” in July 2005. But the arrangement for its initiation was delayed until November 2005 when the project formally commenced its activity as the 3<sup>rd</sup> sister project with an opening ceremony. The project has been progressing in the right track since then demonstrating measurable impacts to the fisheries communities.

As a Component 3, the regional training courses for fishery managers and extension officers were proposed. The role of the fishery managers are provide information to decision maker on formulating and transforming policy into management plans. Extension officers are deal with communities in community development and CBRM. There are vital and the capacity building is urgently called for. More emphasis in this training courses are placed on problem-and-solution analysis and the practical application at the project site level, making best use of experiences and knowledge gained through the ongoing collaborative project operations.

## **2. PROGRAM**

### **2.1. Component 1: Follow-up of the on-going projects**

#### **2.1.1. Project 1: Integrated Coastal Resources Management in Pathew District (ICRM-PD) = LBCFM-PD Phase II (Thailand)**

##### **2.1.1.1. Objectives**

- 1) To develop capacity building of local human resource to empower the local people involved in vigorous community development to manage and sustain coastal resources.
- 2) To develop systematic voluntary participation from the local people in management of local body and to proactively strengthen community development and resource management
- 3) To encourage people’s participation in creating job opportunities and in establishing local businesses to increase accessible income source to alleviate poverty and to develop the economic base of the community

##### **2.1.1.2. Project description**

The SEAFDEC’s Training Department and the Thai DOF agreed that the LBCFM-PD project phase II (2005-2006) as ICRM-PD would place greater emphasis on capacity building and participation of the local people in order to strengthen and lead existing activities resulted from the outcome of the project in phase I. The strengthening of people’s participation was carried out through training courses and extension programs with special topics needed such as group cooperative management, group book accounting, recording, keeping and management, profit distribution as well as allocating incentives to group members. These combined knowledge and skill can contribute to the local people in sustaining community activities and local businesses.

The original project framework envisaged that the newly created sub-district administrative organization called “Ao.Bo.To.” was to take charge of the function of CBFMRM. But through two and a half years’ project operation it was found that this body was not a type of organization which could be involved in such a duty with interests. It was considered so critical thinking in terms of project effectiveness and sustainability that the project basic approach was rectified. In 2005 and 2006, the major project effort was centered at establishment of the fishermen’s group as a core organization by building up their institutional, managerial and functional capacity. As the result, the Pakklong Fishermen’s Group (PFG) consisted of seven sub-groups was established in March 2005 and it was further legally registered with the Provincial authorities concerned in December 2005. Since then, the PFG has been empowered to pursue various functions and activities with its own motivation, and it is very optimistic that it will further

strengthen its institutional managerial capacity with continued support by the DOF of Thailand and close monitoring on its progress by SEAFDEC/TD.

It was envisaged from the outset that the SEAFDEC/TD's involvement in the project's physical operation would be gradually reduced over time; in the mean time the counterpart organization under the Thai DOF, i.e. Chumphon Marine Fisheries Research and Development Center (CMDEC), would take over the leading role of the project operation step by step. Toward the end of the project in 2006, it was further envisaged that the project management capacity should be transferred to the newly formed Pakklong Fishermen's Group (PFG). This arrangement will be able to maintain the sustainable coastal resources and community development in the area with continued supports from relevant authorities like CMDEC, Chumphon Marine Coastal Resources Research Center (MCR), Chumphon Fisheries Office and other district and sub-district administration offices. This is the ultimate goal of the project.

As such, SEAFDEC/TD has continued its involvement into the follow-up activity of the project operation since January 2007.

### 2.1.1.3. Progress of activities in the year 2007

As aforementioned, the major activity in 2007 was the follow-up ones which monitored and supported the activities primarily deployed by DOF Thailand and various local administrative agencies along with the newly organized Phakklong Fishermen's Group. The feature activity in this year lies in the project wrap-up regional seminar held in July 2007.

Proposed activity	Description of achievement	Achievement
<b>Activity 1: Compilation and publication of reports</b> - Several research data are compiled and published.  - The project final report is compile	All remaining research data were compiled and published.  The final report is yet prepared pending publication of the seminar proceedings.	100%  50%
<b>Activity 2: Follow-up activity</b> - Participation to SC/IC meetings  - Participation to local seminar  - Involvement in project related activities	Participated in the preparatory IC meeting for the regional seminar and the 11 <sup>th</sup> IC meeting  Participated in various local seminar/ workshops for demonstration of project impacts  Pursuing incomplete project activities like Crab Bank scheme, monitoring fish releasing and fish landing survey	100%  100%  100%
<b>Activity 3: Regional seminar</b> - Regional project wrap-up seminar	Project Wrap-up Seminar was organized in Chumphon on 10 – 12 July. Publication of the proceedings is under way.	90%

#### **2.1.1.4. Proposed future activities**

In fact, the project was terminated in December 2006 as initially scheduled and the activity in 2008 is confined to just follow-up works as listed below.

##### Activity 1: Follow-up activity

- Participation to SC and IC meetings
- Participation to the local seminar
- Monitoring crab bank activity
- Monitoring fish fingerings releasing activity
- Supporting in fish landing survey

#### **2.1.2. Project 2: Integrated Coastal Resources Management in Pulau Langkawi (ICRM-PL) = LBCRM-PL Phase II (Malaysia)**

##### **2.1.2.1. Objectives**

- 1) To develop capacity building in local human resources to empower the locals to manage and sustain coastal resources and vigorous community development.
- 2) To develop systematic voluntary participation of local people in local management body and to proactively strengthen community development and resource management
- 3) To encourage people's participation in creating job opportunities and in establishing local businesses to increase accessible of income source to alleviate poverty and to develop the economic scale of the community.

##### **2.1.2.2. Project description**

Toward the termination of the first phase of the project under the TF-1 in December 2004, the project ICRM-PL had been running very effectively in producing some tangible outputs until the day of 26 December 2004 when the devastating tsunami assaulted the project operational area, leaving very tragic damages behind. Most fishing boats and fishing gear were destroyed or lost, and the fish landing facilities were ruined. Many fishermen's houses collapsed. The Malaysian authorities together with NGOs and foreign aid organizations immediately started the rehabilitation of the tsunami stricken fisheries sector. Resulting from these efforts extensively exerted in 2005 and 2006 some fishing activities have more or less reactivated. This unexpected natural calamity caused major changes and delays of the project in approach and progress. The project work-plan in 2005 was revised drastically so as to meet the acute requirement of the fishing sector and the project tenure was extended for one more year until the end of 2007 to offset the retardation of planned activity. In 2006, some rehabilitation related activities were continued along with the development work originally envisaged. In 2007, the fishermen in the project operational area felt that the rehabilitation stage from tsunami disaster had been over. The project has resumed its development work as originally scheduled. The project is anticipated to be terminated toward the end of 2007.

##### **2.1.2.3. Progress**

The major emphasis in activity in 2007 was placed on reactivation of the project activities, particularly the establishment of zoning demarcation and the formulation of its fishery management plan. The detailed project progress is dealt at length in the first and the second biannual project progress reports in 2007. The feature progress lies in establishment of KPSP (Fishery Resources Management Community) in place of KEN (Fishermen Economic Group) to pursue various fishery resources management activities and also in formulation of Fishery Plan which is at the final process of promulgation. In addition, all necessary infrastructures constructed under the tsunami rehabilitation have been completed.

Proposed activity	Description of achievement	Achievement
<b>Activity 1: Monitoring survey</b> - Continue regular fish landing and marine biological surveys and data compilation	The regular fish landing, marine biological and oceanographic surveys were continued jointly with Fishery Research Institute, Penang, and the data were analyzed and compiled.	100%
<b>Activity 2: Encourage CBRM</b> - Finalize and promulgate Fishery Management Plan (FMP)  - Implementation of FMP  - Strengthening Local Enforcement Unit (LEU)	The FMP was formulated and in the final stage of promulgation.  KPSP (Fishery Resources Management Community) was established. The crab bank scheme began with the Japanese model.  The Local Enforcement Center (LEC) was established and manned with 2 enforcement officers from Marine Enforcement Agency(MEA).	80%  30%  50%
<b>Activity 3: Encourage local business</b> - Diversification and standardization of products of Women's Economic Group (KEW)  - Improvement of business management skill  - Identify and promote potential local business for KPSP	New products were developed. The new fish proceeding yard was completed with more hygienic processing lines.  The user-friendly bookkeeping and accounting system was introduced, and thereby the business management skill of KEW is improved.  The new mechanical workshop was completed and the business of engine and boat repairing was commenced by KPSP.	100%  100%  70%
<b>Activity 4: Encourage HRD</b> - Arrange various training courses and study tours to strengthen the people's and institutional capacity building and participation	Various training courses and workshops were conducted to strengthen people and institutional capacity building. The KPSP was newly formed in place of KEN in a bid to pursue the CBRM approach more intensively.	100%
<b>Activity 5: Fishing gear technology improvement</b> - Follow-up training in wooden boat repairing and improved fishing methods	Follow-up training was not taken place as this business was rendered to the private sector by KPSP. No significant impact was seen in introduction of new and improved fishing methods except collapsible crab trap.	10%
<b>Activity 6: Resources enhancement</b> - Installation of improved type FEDs by TD  - Impact marine biological survey	The training in construction of improved type FED was conducted and thereafter 10 units were fabricated by hands of fishermen. These units were installed in the zoning.  The pre-installation marine biological survey and the impact survey were conducted.	100%  100%

<b>Activity 7: Project evaluation</b> - The terminal project evaluation is conducted.	The terminal project evaluation could not be executed as a relevant outsourced consultant could not be identified with the limited cost.	0%
<b>Activity 8: Committee meetings</b> - Conduct the SC and ICC meetings	The 5 <sup>th</sup> SC meeting was summoned in March. The 9 <sup>th</sup> meeting was held in July.	80%

#### 2.1.2.4. Proposed future activities

The project is bound to be terminated in December 2007 and the activity in 2008 is confined to follow-up work as listed below.

##### Activity 1: Compilation and publication of reports

- Several surveys conducted in 2007 are compiled and the reports are published
- The project final report is compiled and published.
- The project evaluation report is published.
- The regional seminar report is compiled and published.

##### Activity 2: Follow-up activity

- Participations in IC meetings
- Participation in the local seminars and workshops organized by DOF Malaysia
- Monitoring crab bank activity
- Monitoring the women's group activity

##### Activity 3: Terminal project evaluation

- Final socio-economic survey
- Terminal project evaluation
- Wrap-up SC meeting

##### Activity 4: Regional seminar for project wrap-up

- A regional seminar is organized to review impacts resulted from the project operation with participation of representatives from SEAFDEC member countries.

## 2.2. Component 2: Extension of the project concept to other member countries

### 2.2.1. Project 3: Integrated Coastal Resources Management in Sihanoukville (ICRM-SV) Cambodia

#### 2.2.1.1. Objectives

- 1) To develop capacity in local human resources to empower the locals to manage and sustain coastal resources and vigorous community development
- 2) To develop systematic voluntary participation from the local people to manage the local body and to proactively strengthen community development and resource management
- 3) To encourage people's participation in creating job opportunities and in establishing local businesses to increase accessible of income source to alleviate poverty and to develop the economic scale of the community.

### 2.2.1.2. Project description

Prior to the official commencement of the project operation, the preliminary site survey was conducted in June 2004 and a suitable site for the CBFRM project was identified in Sihanoukville among a few sites proposed by FiA Cambodia. The plan to initiate the project in Cambodia from 2005 was submitted to the 27<sup>th</sup> PCM and it was endorsed. The baseline socio-economic survey was conducted in early 2005, and based on the findings of which the project document was formulated and finalized in July 2005. However, the actual project commencement was delayed until November 2005, mainly due to the delayed administrative arrangement within the Steering Committee meeting's structure.

After commencement of the project operation in November 2005, the project coordinated with the Japanese Embassy in Cambodia to grant about USD 11,400 to construct facilities necessary for carrying out mud-crab culturing within the project activity of local business development.

In 2007, the project has been progressing on the right track consistent with the project orientation, particularly in formulation of the fisheries management plan and related document consistent with the contents in the Decree and Sub-decree on community fishery resources management which were promulgated in 2005. As such, the project will enter the stage in where community-based fishery resources management practices are put in place in 2008. However, this attempt is entirely new to the country, also new to the region in a sense that the CBFRM is executed under full compatibility with the legal framework, and it needs more ample time to demonstrate the practical applicability of the Decree and Sub-decree. Hence, it is proposed to extend the project tenure for another year up to December 2009 when the TF-IV is to be terminated. Thereby, the project span would become about four years and two months in total.

### 2.2.1.3. Progress

The major activity in 2007 focused on particularly in human and institutional capacity building with the community fisheries in the project operational area so as to strengthening the the foundation of the project framework, in consolidating mutual working relationships at provincial as well as district levels and encouraging all stakeholders to participate in project operations. The detailed project progress is dealt at length in the first and the second biannual project progress reports in 2007.

Proposed activity	Description of achievement	Achievement
<b>Activity 1: Baseline/ Monitoring survey</b> - Continue regular fish landing data collection and analysis.	The daily data collection is regularly continued by designated enumerators. The obtained data in 2006 were analyzed and compiled.	100%
<b>Activity 2: Encourage CBRM</b> - Formulation and submission of the CFAA and other related documents  - Formation of Community Fisheries Coordination Committee (CFCC)	The drafts of CFAA and CFAMP and other related documents were formulated and submitted to the Governor of SHV after various administrative steps to be taken. These documents were eventually approved by the governor pending an official gazette ( <i>Prakas</i> ) as an interim measure.  The formation of CFCC was postponed and meantime the project ICC meeting is acting its function.	100%   30%

<ul style="list-style-type: none"> <li>- Strengthening the capacity and function of LEU</li> </ul>	<p>The function of LEU was further activated together with participation of Enforcement officers in patrolling.</p>	<p>100%</p>
<p><b>Activity 3: Encourage local business</b></p> <ul style="list-style-type: none"> <li>- Continue and expand mushroom production by women's group</li> <li>- Initiate mud-crab culturing</li> </ul>	<p>Mushroom production is continued with increased outputs among 4 women's groups. Expanded business lines in use of saved funds were promoted. Monitoring on proper bookkeeping and accounting is continued.</p> <p>Construction of mud crab pond was completed under the auspices of Japanese Grassroots Fund. Experimental mud-crab culture commenced. Renovation of ponds was made. The 2<sup>nd</sup> experimental culturing commenced. Training and monitoring on bookkeeping and account are made. An experimental sea bass culturing was commenced.</p>	<p>100%</p> <p>100%</p>
<p><b>Activity 4: Enhancement in HRC and participation</b></p> <ul style="list-style-type: none"> <li>- Restoration of data and information to stakeholders</li> <li>- Conduct various workshops, training course and study tours</li> <li>- Participate in community and environmental development works</li> <li>- Publication of reports and PR materials</li> </ul>	<p>Restoration of data and information was achieved through various occasions like a local seminar and workshops</p> <p>Various training courses, workshops and study tours were organized primarily aimed at building up human and institutional capacity of the Community Fisheries. Participation in the regional seminar held in Chumphon, Thailand, was performed to demonstrate the project progress.</p> <p>Needs in participation in community and environmental development works were identified. Voluntary participation in mangrove plantation is performed.</p> <p>A number of reports were published. The four project sign boards were put up at the project sites.</p>	<p>100%</p> <p>100%</p> <p>100%</p> <p>90%</p>
<p><b>Activity 5: Resources enhancement</b></p> <ul style="list-style-type: none"> <li>- Study on establishment of fish conservation area or fish refugia</li> <li>- Establishment of Crab Bank (unplanned)</li> <li>- Mangrove reforestation (unplanned)</li> <li>- Establishment of fish refugia (unplanned)</li> </ul>	<p>The national workshop in establishment of fish refugia was held. The preliminary survey on establishment of fish refugia was conducted. The mangrove reforestation has been implemented.</p> <p>Establishment of Crab Bank is under preparation.</p> <p>1,000 mangrove saplings were planted with voluntary participation.</p> <p>A preliminary survey in establishment of fish refugia is conducted.</p>	<p>100%</p>
<p><b>Activity 6: Fishing technology improvement</b></p> <ul style="list-style-type: none"> <li>- Place in lower priority for the time being</li> </ul>	<p>As the result of the outcome of discussions with fishers and FiA Cambodia in December 2005, this activity is placed in lower profile.</p>	

<p><b>Activity 7: Project management meetings</b></p> <ul style="list-style-type: none"> <li>- The Steering Committee (SC) meeting is held once a year.</li> <li>- The project Implementation Coordination Committee (ICC) meetings are summoned once every 4 months.</li> </ul>	<p>The 3rd SC meeting was summoned in March.</p> <p>The 4th and 5th ICC meetings are held in May and October respectively.</p>	<p>100%</p> <p>67%</p>
<p><b>Activity 8: Project evaluation</b></p> <ul style="list-style-type: none"> <li>- The project evaluation</li> </ul>	<p>The internal project evaluation is made at the occasion of the national seminar in December. The mid-term project evaluation is pending.</p>	<p>30%</p>

#### 2.2.1.4. Proposed future activity

In 2007, the project operation has been put in place in full scale and it is anticipated to be deployed further in 2008 in line with the original project orientation.

##### Activity 1: Baseline / monitoring survey

- Continuation of the regular fish landing data collection
- Analysis and compilation of the results obtained in 2007

##### Activity 2: Encouragement and extension of locally-based fishery resources management

- Coordination in promulgation of the Community Fisheries Area Agreement (CFAA) along with CFAMP, BL, IL and MCFA
- Formation of Community Fisheries Coordination Committee (CFCC)
- Practical application of CFAMP in close consultation with CFCC
- Strengthening the capacity and capability of local enforcement activity

##### Activity 3: Promotion of local business

- Monitoring mushroom production with emphasis on commercially viable management
- Identify and initiate other potential local businesses
- Continuation of mud-crab culturing with emphasis on commercially viable management
- Commencement of tilapia / sea bass culturing in use of mud-crab ponds

##### Activity 4: Enhancement in human resources capacity and participation

- Village workshops aimed at increasing awareness on implementation of CFAMP
- Conducting a national seminar to review the project progress
- Conducting various training courses and study tours
- Identify and implement relevant volunteer works for community development and environmental improvement
- Publication of reports and manuals and PR materials

##### Activity 5: Rehabilitation and enhancement of coastal resources

- Establish and manage fish refugia
- Establish and manage Crab Bank
- Mangrove reforestation



Activity 6: Fishing / fish handling technology improvement

- Placed in the lower priority and no activity carried out

Activity 7: Project management meetings

- Conducting Steering Committee (SC) meetings once a year at minimum.
- Holding Project Implementation Committee (IC) meetings once every 4 months.

Activity 8: Project evaluation

- Project evaluation is taken place
- Publication of the project evaluation report

### **2.3. Component 3: International Training Courses on Coastal Fisheries Management for Fishery Managers and fisheries extension officers**

#### **Courses Arrangement**

##### **2.3.1. Objectives**

- 1) To extend the knowledge, skills and attitude of coastal fisheries managers at the central level and fishery officers at field level in the concept of sustainable coastal resources utilization and management
- 2) To introduce and share knowledge/experience of SEAFDEC with collaboration of national DOF pilot projects in ICRM-PD, ICRM-PL and ICRM-SV in Thailand Malaysia and Cambodia respectively and other Coastal fishery management projects which are organized by DOF sectors and other fishery agencies, to the region.

##### **2.3.2. Project description**

Referring to the Millennium Conference “Fish for the people” organized by SEAFDEC in 2001, addressed the issue and confirmed the emerging co-management concept for fisheries as the new policy thrust for the region. Establishing such co-management systems and making them functional requires capacity building efforts for all key players, to take up their respective responsibilities under such systems. In regarding to this TD has been conducted the two regional training courses in order to build up capacity efforts for all key players: 1) The international training course on coastal fisheries management for fishery managers, this course focus on sharing experiences and lessons from various pilots projects in co-management for policy formulation and designing fishery management plans addressing locally specific management needs. and 2) The international training course on coastal fisheries management and extension methodology, this course designed to familiarize the participants with co-management principles for small scale fisheries and the necessary extension skills for establishing and supporting participatory fisheries mixture of lectures, innovative classroom activities, and extensive field practices that promote active learning, the participants learn to first understand the need for the local level participatory fisheries management approaches. Then they are familiarized with approaches and tool as that can help them facilitate community an stakeholder dialogues for analyzing local resource use patterns and livelihood issues and for formulating solutions for these issues.

### 2.3.3. Progress

In the year 2007, Two Training courses were continued to conduct in order to transfer knowledge to SEAFDEC member countries and interested people as follows.

#### The International training course on Coastal Fisheries Management for Fishery Managers

The course was conducted between 10<sup>th</sup> –24<sup>th</sup> June 2007. There were 10 participants from SEAFDEC fellowships (Brunei Darussalam, Cambodia, Indonesia, Japan, Myanmar, Malaysia, , the Philippines, Thailand and Vietnam) and 5 Sri-Lankan participants from CRMP Project sponsor, 2 participants from SIDA sponsor, 1 from FMO-Thailand and 1 from AIT so in totally we have 19 participants attended this training course. This course aimed to assist the Managers to practice in acquiring and analyzing information from several pilot projects in coastal fisheries management for Policy formulation, and to design coastal fishery management plans that suit their local conditions. The Training was composed of two main parts; there was a part for lectures and another part for pilot project introduction including field trips on Integrated Coastal Resource Management in Chumporn Province, During the lecture session, participants refreshed their knowledge on Responsible Fisheries Aspects in Southeast Asia, a Characteristic of Coastal Fisheries Resource and Management, the Right-based and Co-management systems in Japan. For the session on pilot projects introduction and field trips, the participants were introduced to the background and some other important information of each pilot project, the visits to the pilot projects were made after that. During the visits and observation, participants worked as groups for active research on each project, all information was interpreted and used as cases studied. At the end of the course, a presentation on Management Plans for two pilot projects by four groups of participants proved that the participants were able to meet with the course expectations and the course objectives. Participants believed that the knowledge and experience they gained can be used and applied to their project management plans in their home countries.

#### International Training Course in Coastal Fisheries Management and Extension Methodology

The course was held on 11<sup>th</sup> September to 11 October 2007. . There were 12 participants from SEAFDEC fellowships (Brunei Darussalam, Cambodia, Indonesia Japan, Laos, the Philippines, Thailand and Vietnam) and 5 participants from CRMP Project sponsor, 1 participants from FMO so in totally we have 18 participants attended this training course. The course focuses on modern principles and concepts of coastal fisheries and resources management; The need to change fisheries management towards co-management, involving local communities and applying eco-system principles to fisheries management; Small-scale fishery problems and constraints; Facilitation, mediation and conflict resolution skills, Extension concepts, methodologies and implementation; Study/field trips to fishing villages and media centres; Practical involvement and presentation of extension media. After completed, the participants understood modern principles and concepts of coastal fisheries resource Management, extension concepts and methodologies. During field trip to fishing communities in Rayong province participants are trained to use the active extension tools and methods such as semi-interview, mapping, seasonal calendar, historical timeline, Venn's diagram, problem and preference ranking in gathering the ground situation and present problems to the communities leading directly to problem solving. Base on the evaluation session which carrier out at the end period of the training course, the results showed that there were about 85 % of the participants full filled their knowledge expectation and due to this they will be able to use/transfer/apply knowledge, skill and experience which they have gained from the course to their job in their home countries.

#### **2.3.4. Proposed future activities**

Activity 1: Two-week Regional Training Course on Coastal Fisheries Management for Fishery Managers of SEAFDEC's member countries. (6 -20 May 2008)

Objectives of the course:

- 1) To extend knowledge and experience of the fishery managers of SEAFDEC's member countries on sustainable coastal resource utilization and management
- 2) To introduce the practicable methods and approaches in coastal resource management in different conditions
- 3) To introduce and share experiences of the Integrated Coastal Resource Management (ICRM-PD, ICRM-PL and ICRM-SV) projects of SEAFDEC/TD's and fisheries government pilot projects to the region, specially the ICRM-SV will be used as the case study and site visit for the training course in this year.
- 4) To strengthen practical in competence in planning and implementing the applicable coastal fishery management plans.

Course content:

The training course will be conducted in English. Subjects dealing with coastal fisheries management concept, approaches and case studies.

The course will includes lectures, group discussion, and the pilot projects and case study visits.

The elements of the course will consist of;

- 1) Overview of Coastal Fisheries Management in ASEAN,
- 2) Responsible Fisheries aspects in Southeast Asia,
- 3) Characteristic of Coastal Fisheries Resource and Management,
- 4) Rights-base and co-management for coastal fisheries management,
- 5) Integrated Coastal Resource Management : ICRM-PD, ICRM-PL and ICRM-SV in
- 6) Thailand, Malaysia and Cambodia respectively
- 7) Case study and the site visit on the Integrated Coastal Resource Management: ICRM-SV, in Cambodia.

Activity 2: Four-week Regional Training Course on Coastal Fisheries Management and Extension Methodology for Extension Officers of SEAFDEC' s member countries. (2 - 20 September 2008)

Objectives of the course:

- 1) To extend the knowledge and skills of extension officers of SEAFDEC member countries in the following areas:
  - Coastal resource management
  - Participatory approach for co-management of fishery resources
  - Extension concept, methodology and participatory research method (PRA)
  - Managerial and conflict resolution skill for managing fishery resources and local organization
  - Communication and extension media production.
- 2) To introduce and share experience of the SEAFDEC with collaboration of national DOF pilot projects in ICRM-PD, Chumporn province, Thailand, ICRM-PL, Lankawi, Malaysia and ICRM-SV, Sihanoukville, Cambodia. Specially the ICRM-SV will be used as the field site visit and case practical session on the PRA tool exercise.

Contents of the course:

- 1) Innovative approaches to coastal fisheries management,
- 2) Fishery extension concept, methodology for participatory management approach
- 3) Essential skill for participatory research and management
- 4) Media production and communication process for extension work

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Support to Tsunami Rehabilitation of Affected Countries in the ASEAN Region

**Lead Department:** Secretariat in collaboration with the Department

**Total Duration:** 2008

### 1. INTRODUCTION

Fishing and aquaculture households and coastal communities in the region were especially hard hit by the tsunami in December 2004. The impacts caused the death of fisher-folk as well as loss of fishing and aquaculture assets and related onshore infrastructure, both of which have reduced the ability of households to earn income and sustain livelihoods. This has also directly hit the pre-tsunami most vulnerable groups (poor fisher-folk communities, single headed households, illegal migrant workers, and other).

In the process of implementation the basic strategy is to build upon expressed needs and in the wake of the tsunami, to improve management of fisheries, fishing capacity and to better manage coastal environments, including coastal restoration as needed, as a protection against future hazards while at the same time provide an important element to the sustainability of the fisheries by securing important habitats. Throughout the process of implementation training sessions will be organised. The general approach to be taken is to pay attention to **the interface in moving from restoration and rehabilitation to longer –term management responses**. Co-ordination among regional, international and local organizations is another pillar of the project strategy, including institutions that are concerned with environment and conservation issues, as well as those mandated to consider the production and sustainable use of the natural resources and fisheries in the affected countries.

### 2. PROGRAM

#### 2.1 Objectives

The immediate objective is to have, “Capacity for the integration of fisheries management into habitat management and for the management of fishing capacity built up/rebuilt and improved in selected areas of ASEAN tsunami affected countries”. Results are to be delivered in four main categories:

- 1) Management options identified for the management of fisheries with emphasis given to the protection of coastal habitats, important for critical life-cycle stages of fisheries resources as well as for protection of coastal communities against future natural hazards (introduction of the refugia concept);
- 2) Management of fishing capacity in the post-tsunami rehabilitation addressed;
- 3) Local knowledge and practices with regards to management and response to natural hazards made available as inputs to work-out programmes on safety at sea and to develop simple early warning systems; and
- 4) Policy dialogue and information sharing with FAO, ASEAN, ASEAN-SEAFDEC Member Countries

#### 2.2 Program description

In the process of implementation four main aspects that have been highlighted in various *fora* will be addressed and incorporated in the process:

- 1) The vulnerability of poorer coastal communities to natural hazards and the risk of them being (further) marginalized during the restoration process.
- 2) Fishing capacity.
- 3) Maintaining geographical features in the coastal areas, recognizing the importance of features (mangroves, corals, dunes, etc.) in the coastal areas for protection against natural hazards needs to be assessed as well as for fish reproduction.
- 4) Local knowledge and local organization: Several reports have pointed at the way in which certain coastal communities, based on their traditional knowledge, were facing less damage than other communities.

### **3. ACTIVITIES FOR THE YEAR 2008**

The project will not be implemented in isolation but will rely on cooperation with other regional/international and national bodies. With a view to address issues related to fishing capacity and the management of important habitats for fisheries SEAFDEC will work with provinces and districts to support the development of a management framework. This will place SEAFDEC in position to add value and build upon work implemented by other organizations as well as earlier interventions by SEAFDEC in the affected countries. Furthermore, SEAFDEC will also provide an opportunity to lift the perspective from the direct intervention at local level to see how a broad range of more site specific efforts contribute to longer term sustainability and as needed provide advice on changes/adjustments that are needed (such as in the case of over-capacity being built up). The timing should be good as experiences from different localities are emerging.

Co-ordination among regional, international and local organizations is another pillar of the project strategy. It is not envisaged that the project itself should build up any new structures, but rather work with and build up the capacities of already existing units and projects. The links to other organisations and ongoing projects is another factor in assuring adequate support and support capacity. In practical terms, co-ordination at regional level will be maintained through the mechanisms of the CONSRN, spearheaded by FAO Regional Office in Bangkok (and the newly recruited tsunami coordinator). At national level, primarily in the two most affected countries, coordination will be sought with the Ministry of Marine Affairs and Fisheries (MMAF), Indonesia, Department of Fisheries, Thailand, the Rehabilitation and Reconstruction Agency (BRR – Badan Rehabilitasi dan Rekonstruksi) in Indonesia, FAO and ADB. Cooperation will also be sought with local NGO's like the Panglima Laot in Banda Aceh, Yadfon in Thailand and the Mangrove Action Project.

The project activities in the year 2008 will be implemented in corresponding to the following outputs:

- 1) Management options provided for the sustainable management of fisheries and habitats of importance for fish reproduction and protection against future natural hazards (introduction of the refugia<sup>1</sup> concept) Management options identified for the management of fisheries with emphasis given to the protection of coastal habitats, important for critical life-cycle stages of fisheries resources as well as for protection of coastal communities against future natural hazards (introduction of the refugia concept);
- 2) Management of fishing capacity in the post-tsunami rehabilitation addressed;
- 3) Local knowledge and practices with regards to management and response to natural hazards made available as inputs to work-out programmes on safety at sea and to develop simple early warning systems;

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<sup>1</sup> Fisheries refugia in Southeast Asia are commonly understood as: "Spatially and geographically defined marine or coastal areas in which specific management measures are applied to sustain important species (fisheries resources) during critical stages of their lifecycle, for their sustainable use".

- 4) Policy dialogue and information sharing with FAO, ASEAN, ASEAN-SEAFDEC Member Countries.

The project will be implemented in matching with the works under the program on the Regionalization of the Code of Conduct for Responsible Fisheries, Component II. Details of activities for 2008 in relation to the outputs are showed in the table below:



**SEAFDEC-Sida Project on activities in follow up to the tsunami**

Proposed First 15 Months

**Schedule for activities to Output 1:**

	M 1	M2	M 3	M4	M 5	M 6	M7	M 8	M 9	M 10	M 11	M 12	M13	M14	M15
1. Develop criteria to determine the national, sub-regional and trans-boundary significance of specific areas															
2. Identify at least one area in Indonesia and one in Thailand based on the regionally developed criteria															
3. Review fisheries and habitat management systems in the identified areas in Indonesia and Thailand															
4. Systems to protect important nursery grounds and spawning areas for at least two areas															
5. Information for capacity building on fish stocks conservation and sustainable practices among province and district offices two selected areas															
6. Information and capacity building on the importance to maintain coastal features to province and district offices in Indonesia and Thailand															
7. Management regimes based on the integration of fisheries management into habitat management (refugia) in the two identified areas	Y2														
8. Develop priorities for fisheries management and management of areas of importance as nursery and spawning grounds for the Andaman Sea	Y2														
9. Develop priorities for the restoration and maintenance of geographical features in coastal areas	Y2														
10. Process to develop regional and national action plans to develop a regional system of refugia for maintenance of regionally important fish stocks															



**Schedule for activities to Output 2:**

	M 1	M2	M 3	M4	M 5	M 6	M7	M 8	M 9	M 10	M 11	M 12	M13	M14	M15
1. Survey, in four selected areas, boats that have been provided during the rehabilitation and restoration process															
2. Review destructive fishing and aquaculture activities in the Andaman Sea region and the four selected areas															
3. Initiate consultative process to identify various options to alleviate problems caused by excess levels of fishing capacity for two selected areas															
4. Action plans on the need to address over-fishing, destructive fishing practices and fishing capacity in the rehabilitation process in two selected areas	Y2														
5. Awareness raising to manage fishing capacity in dialogue with stakeholders															
6. Process to develop systems to determine the level of optimal fishing capacity, based on available information on fishery resources and habitats.	Y2														
7. Work on simple assessments on how levels of optimal fishing capacity might/will change over time	Y2														
8. Promote further improvement, preparation and implementation of activity plans to manage fishing capacity.	Y2														

**Schedule for activities to Output 3:**

	M 1	M2	M 3	M4	M 5	M 6	M7	M 8	M 9	M 10	M 11	M 12	M13	M14	M15
1. Survey local knowledge and actions among ethnic groups and coastal communities in two countries															
2. Develop ways to incorporate local responses to natural hazards into a safety-at-sea programme															
3. Develop ways to have smaller fishing vessels providing information to villages on approaching hazards	Y2														
4. Review seaworthiness of boats provided during the rehabilitation and restoration process in four selected areas															
5. Process to improve or establish systems for registration of boats in at least two of the affected countries															
6. Develop a training programme for safety-at-sea and rescue at sea of relevance to the mitigation of effects caused by marine natural hazards															
7. Train trainers from/in selected areas	Y2														
8. Support the process to work out simple early warning system and response packages by facilitating input of local knowledge and practices															

**Schedule for activities to Output 4:**

	M 1	M2	M 3	M4	M 5	M 6	M7	M 8	M 9	M 10	M 11	M 12	M13	M14	M15
1. Review the criteria and indicators currently in use for decision making on future use of fisheries and coastal areas, with changes since the Tsunami															
2. Review how poorer fishing households have been affected by the Tsunami and how they have benefited from rehabilitation programmes															
3 Information and advise to ASEAN and ASEAN-SEAFDEC Member Countries on the management of fisheries and important habitats															



4. National legislation and institutional arrangements pertaining to management of the exploitation of fisheries and critical habitats															
5. Review international fisheries conventions and other conventions with a view to how they are implemented in the four affected ASEAN Countries															
6. Regional Technical Consultation with all ASEAN-SEAFDEC member countries on recommendations for protection against future natural disasters	Y2														
7. Other regional FAO-ASEAN-SEAFDEC, etc events organised if called upon to promote policy dialogue and coordination	Y2														



## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Fisheries Resources Survey and Operational Plan for MV SEAFDEC2

**Lead Department:** Training Department

**Lead Country:** [Country Name]

**Duration:** Since 2004

### 1. INTRODUCTION

Government of Japan gave a Fisheries Research and Training Vessel names MV SEAFDEC-2 to SEAFDEC/Training Department under the Japan's Grant Aid Scheme for Eligible Countries since March 2004. The vessel have been utilized by the Grant Aid Eligible Countries and other SEAFDEC member countries in order to conduct coastal fishery stock surveys while providing training in fishing and catch handling operations to. To achieve these activities and to ensure that main benefit of the MV SEAFDEC 2 is given to SEAFDEC member countries, therefore Eligible countries and operational committee was set up. Due to budget constraints in 2006 the meeting of Eligible Countries and Operation Committee is ceased, however utilization of MV SEAFDEC2 for the national fisheries resources program requested by member countries are maintained. In 2007, funding support to the operation of MV SEAFDEC2 was mainly from the Minimum Regular Contribution (MRC) and the cost-shared policy on the use of MV SEAFDEC2.

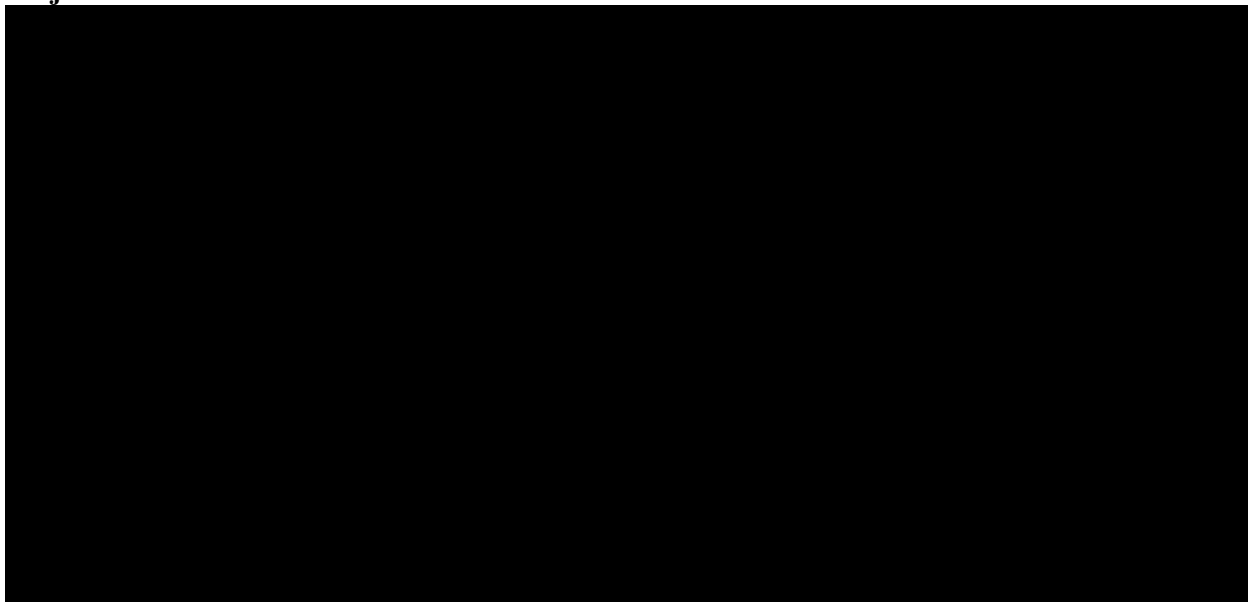
### 2. PROGRAM

#### 2.1 Objectives

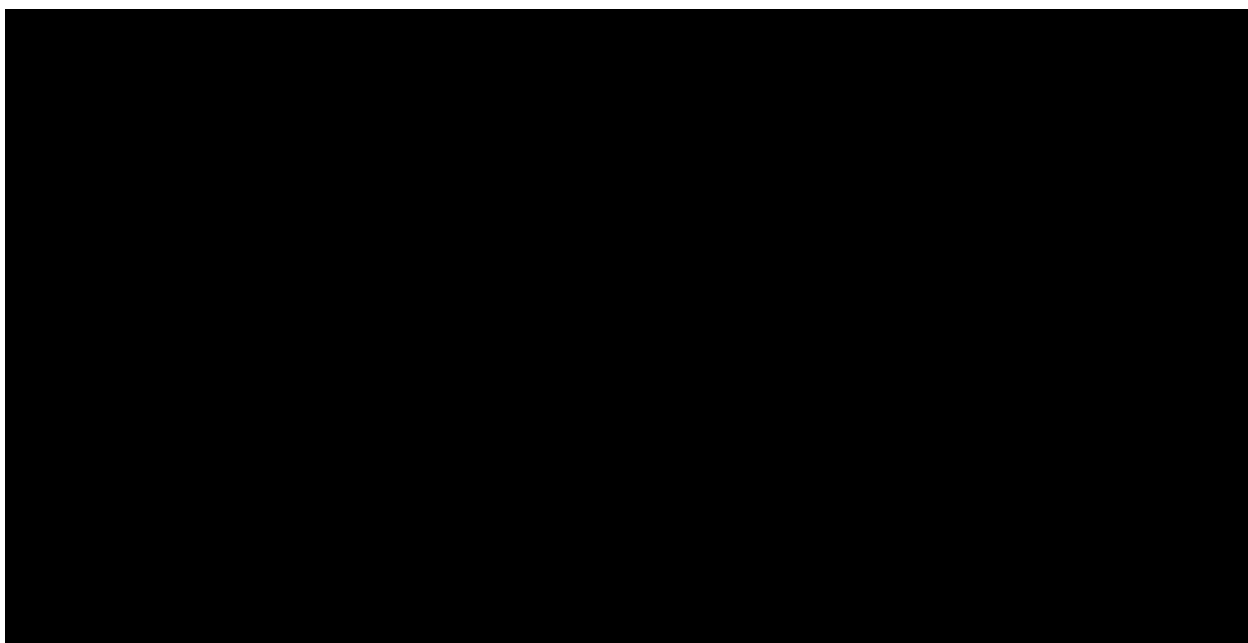
- 1) To support SEAFDEC member countries on the National Fisheries Resources Survey by utilizing the MV SEAFDEC2 under the Cost-Shared Policy,
- 2) To consult and advice to SEAFDEC member countries on the use of MV SEAFDEC2,
- 3) To compile the results and findings from the national survey for re-analysis at the regional level
- 5) To endorse the 2008 tentative plan for utilization of MV SEAFDEC2 requested by SEAFDEC member countries

### **3. PROGRESS OF ACTIVITIES IN THE YEAR 2007**

#### **Project Activities**



### **4. PROPOSED ACTIVITIES FOR THE YEAR 2008**



## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Deep Sea Fisheries Resources Exploration in the Southeast Asian Waters

**Lead Department:** TD

**Lead Country:**

**Duration:** 2007-2012

### 1. INTRODUCTION

Due to depletion of the inshore/coastal fisheries resources in the Southeast Asian Countries, in conjunction with the fuel crisis that make many fishermen suffering and detriment, some fishermen 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 sea food materials to many fish processing industries in the region and reduce the food supply in the Global level in 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 and to implement this research work it is very much needs to get fully support in both funding and capacity building from government.

Consideration of the geographic features in the Southeast Asia Waters, more than 50% of the sea areas are identified as deep sea whereas utilization of those resources have not been initiated yet. This is due to lack of information on the species composition and how potential of the resources. In addition, It is clear that Research vessel for deep sea survey seems to be one of the main factors that many countries in region are facing. There are not many research vessels in the region can conduct the deep sea resources survey due to lack of facilities, scientific instruments, type of fishing gears for fish samplings, and expertise. To encourage members to initiate on the deep sea resources exploration, therefore, modification of sampling gears for those research vessels may essential.

In point of view of the international concerns on the ecosystem approach for the deep sea fisheries, to provide better understanding to the member countries on the deep sea issues in the international forum therefore exploration of the deep sea resources through this program are need for further consideration and sustainable management.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To investigate the deep sea fisheries resources in collaboration with the SEAFDEC member countries through using of MV SEAFDEC2 and under the cost-shared policy and national research vessels
- 2) To search for new deep sea fisheries resources and fishing grounds in the Southeast Asia Waters
- 3) To investigate the impact of deep sea trawl to the bottom ecosystem through the identification of species composition and underwater observation via VDO camera,
- 4) To enhance the human resources capacity on the deep sea resources exploration such as on Methodology for samplings of deep sea fisheries resources, Identification of deep sea fishes and larval fishes: Taxonomy and Development of appropriated/responsible fishing gear and methods for harvesting/samplings of deep sea resources
- 5) To support the national resources survey using national research vessel by advice member countries on the improving of fishing gear and methods for deep sea fish samplings

## 2.2 Program description

There are two main subjects under the deep sea exploration project as follows:

- 1) Data/information Collection on the deep sea fisheries resources in the Southeast Asian Region through the reviewing of the existing data and actual exploration by SEAFDEC Research Vessel and Nation research vessels in cooperation with member countries.
- 2) Investigate/survey on the impact of trawl fisheries to deep sea eco-systems through the actual survey. On-board training program on the subject will be also conducted in order to encourage member countries on the deep sea exploration and study on deep sea eco-system.

## 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

### Project Activities

Activities	Duration	Status
<b>Activity 1: Supporting of Deep Sea Fisheries Resources Survey</b> 1.1 Review on Deep Sea Resources in the SEA waters 1.2 Technical Consultation Meeting on National Plan 1.3 Consultation Visit 1.4 Supporting of Actual Survey and data collection and experiments for deep sea gear testing	Jan-Dec	70%
<b>Activity 2: Biological and Physical Information of Deep Sea Resources</b> 2.1 Reviewed work on Deep sea fishes species and their biology 2.2 Reviewed work on distribution of deep sea fish species based on available information	Jan-Sept.	100%
<b>Activity 3: Development/Improvement/ Modification of appropriated deep sea fish samplings Technology</b> 3.1 Reviewed work on Deep Sea fish samplings technology 3.2 Develop Deep sea samplings gears <ul style="list-style-type: none"> <li>• Bottom Longline</li> <li>• Collapsible Trap for Deep Sea Shrimp</li> <li>• Giant Cast Net for Purpleback Flying Squid</li> </ul> 3.3 Develop Sampling gears for Larval fish	Jan-Dec	80%
<b>Activity 4: HRD Program on deep sea Research and Samplings</b>	No activity	
<b>Activity 5: Information Dissemination</b> 5.1 Publications 5.2 HRD Training Package <ul style="list-style-type: none"> <li>• Manuals for Deep Sea Samplings Gears</li> <li>• Manuals for Deep Sea fishes biology and taxonomy</li> <li>• Manuals for use and construction of Bongo net</li> </ul>	Feb-Dec	50%

## 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

Activities	Duration	Remarks
<b>Activity 1: Supporting of Deep Sea Fisheries Resources Survey</b> Reviewed work on the deep sea fisheries resources in the Southeast Asian waters will be conducted to check where and how possibility of the survey in the EEZ of member countries. To	Feb-Oct 08	

<p>support the deep sea fisheries resources survey in the EEZ of member countries whether by utilization of MV SEAFDEC2 under the cost shared policy. However, using of MV SEAFDEC 2 its capacity for deep sea bottom samplings by beam trawl is limited not over 500m depth, therefore use of national research vessels that have capacity to work in deeper than 500 will be encouraged and supported in term of sampling gears and others research facilities under the project. Consultation visit and technical workshop will be held to discuss and review on needs and available information for proper survey plan.</p> <p>The workshop on information gathering of deep sea resources survey in the Southeast Asia waters will be held in cooperation with the FAO in this year. In the workshop, SEAFDEC/TD will provide technical inputs and logistic arrangement as a co-organizer.</p>		
<p><b>Activity 2: Deep Sea Ecosystem and its impact from fisheries</b> Reviewed work on biology and physiology of Deep Sea Fisheries Resources in the EEZ of member countries will be made from the existing information and actual survey. Collecting of deep sea fishes samples based on the national research program and MV SEAFDEC2 plan will be conducted. Using of underwater camera to monitoring the deep sea bottom before and after fishing activity by trawl net is one of the methods to study on how impact from trawl fisheries to seabed ecosystem.</p>	Mar-Dec	
<p><b>Activity 3: Development/improvement of the deep sea fish sampling gears</b> In this activity, the appropriated samplings gears for deep sea fishes such as oceanic squid, deep sea shrimp, commercially bottom fishes will be developed based on different topographic features in different deep sea areas. In addition, scientific apparatus such as underwater observation and specific samplings gears for deep sea ecosystem research will be developed.</p>	Jan-Aug	
<p><b>Activity 4: HRD Program on Deep Sea Research and Sampling/ eco-system</b> Human resources development program on deep sea research and samplings will be provided to member countries particularly on Methodology for samplings of deep sea fisheries resources, Identification of deep sea fishes and larval fishes: Taxonomy and Development of appropriated/responsible fishing gear and methods for harvesting/samplings of deep sea resources</p> <p>On board observation program on deep sea exploration will be conducted, member countries which having capacity for deep sea research will be invited using MV SEAFDEC2 or some national Research vessel. This is to enhance the human resources capacity and for better understanding on the deep sea survey.</p>	Xxx	No implementation In 2008
<p><b>Activity 5: Information Dissemination</b> Manual for developing of these appropriated fishing gears and methods will be published and introduced to member countries for national research survey program</p>	Aug-Dec	

**Expected Outcome:**

- 1) Clarification on the Impact of Deep Sea Bottom trawl on the ecosystems
- 2) Species composition of deep sea species



## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**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:**

**Total Duration:** 2007 - 2011

**Proposed Budget:** USD 150,000

### 1. INTRODUCTION

It is believed that pelagic fishes migrate for their ecological demand of spawning and feeding habits to move through the optimum environmental conditions such as current, water temperature, salinity, chlorophyll and prey. Information on migration is most important to consider stock identification and shared stock of pelagic fishes. In the Japanese Trust Fund II (JTF II) project on “Information Collection for Sustainable Pelagic Fisheries in the South China Sea” from 2002 to 2006 the genetic and morphometric analysis were conducted to identify subpopulation and shared stock of the targeted small pelagic fishes. However, subpopulations of these fishes as management unit could not be shown clearly.

Tagging activity is one of the methods to study migration route of small pelagic fishes, which sometimes contributes to good results. In the Gulf of Thailand, about 2,600 Indo Pacific 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 of the species. The DoF Malaysia has also carried out tagging activities for pelagic fishes in the Malacca Strait and east coast of peninsular Malaysia from 1990 to 1998. However, information on migration patterns of the small pelagic fishes in the Southeast Asian region is still quite fragmentary and very poor.

Investigation on migration patterns of small pelagic fishes in the region is an urgent subject for consideration for stock identification and clarification of shared stock for targeted pelagic species. Status of the pelagic resources in the region is still high, judging from the trend of annual catch in the last 20 years. However, the demersal fish resources have experienced an over-exploitation or closed to maximum level exploiting in most part of the region. Therefore, tagging activity of the pelagic fishes is urgently needed for further clarification on the state of the resources.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To reveal movement and migration routes of targeted pelagic fishes in the Southeast Asian waters;
- 2) To reveal growth patterns of pelagic fishes;
- 3) To estimate the stock parameters of F and M using monthly recapture data (if possible).

#### 2.2 Program Description

This program comprises four projects including six activities as follows:

## **Project 1: Meetings/Workshops/Trainings for Effective Program Implementation**

### Activity 1: Demonstration of tagging procedures and practices

Demonstration of tagging procedures and practices will be conducted in Thailand with attendance from participating SEAFDEC Member Countries to facilitate tagging activity in the countries.

### Activity 2: Conduct First Core Expert Meeting

The First Core Expert Meeting will be held in SEAFDEC-TD to discuss project proposal on tagging program for pelagic fishes and to formulate final research plan for tagging activities to be implemented in the South China Sea and Andaman Sea from 2007 onwards. The standard operation procedure will be developed and distributed to all participating member countries before the actual tagging activities take place.

### Activity 3: On-site trainings for tagging activity in each participating SEAFDEC Member Countries (method & data analysis)

Technical Officers of SEAFDEC-MFRDMD and SEAFDEC-TD will conduct on-site trainings at participating SEAFDEC Member Countries to introduce tagging procedure and practices. During the training, a meeting will be held to disseminate tagging program plan of SEAFDEC and to get a good recapture rates for tagged fish in co-operation with fishermen and local staff under the Department of Fisheries.

## **Project 2: Tagging Operation in the South China Sea and Andaman Sea**

### Activity 1: Poster making and tagging material purchasing

Posters on tagging in different national languages will be developed to increase public awareness about tagging activities especially among the local fishermen in participating SEAFDEC Member Countries. In addition, publicity through other electronic media will also be initiated to promote public awareness. Tagging materials will be purchased after the final implementing plan is adopted during the First Core Expert Meeting, and distributed to the participating SEAFDEC Member Countries.

## **Project 3: Data collection and analysis**

This project will commence during the second year project implementation.

## **Project 4: Promotion/Developing of Database/Data Management Software**

### Activity 1: Developing of Database/Data Management Software

Referring to the First Phase of the Program on “Information Collection for Sustainable Pelagic Fisheries in the South China Sea,” a regional database for targeted small pelagic species was developed in order to support the catch and biological data collection from 26 sampling sites. In order to promote and provide best benefits to member countries in using developed database, SEAFDEC/TD has developed another database namely “Data Management Software for small pelagic fishes”. This data management software was developed based on regional database and includes many functions that individual country can fully make use and manage their own data set. The software is useful for all small pelagic fishes and sampling/landing sites depending on the need of user. In addition, the software is able to generate reports automatically including graphics as pre-analysis requirement. Under the second phase of the project implementation on tagging experiment, this database will be further developed for tagging analysis.

### Activity 2: Promotion of Data Management Software/ through Training

Promotion on the use of data management software using catch and fishing effort of purse seine fishery and biological data of small pelagic fishes accumulated in the database under the first phase of the JTF II project will be conducted through on-site training program in the participating SEAFDEC Member Countries.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

Project/Activity Title	Duration	Remarks
<p><b>Project 1: Meetings/Workshops/Onsite training for Effective Program Implementation</b></p> <p>Activity 1: Demonstration of tagging procedures and practices</p> <p>Activity 2: Core Expert Meeting</p> <p>Activity 3: On-site training for tagging in each member countries (method &amp; data analysis)</p>	<p>1 May 2007</p> <p>2-3 May 2007</p> <p>Nov-Dec 2007</p>	<p><b>100% completed</b> Demonstration for small pelagic fish was implemented in Samut-Songkran, Thailand.</p> <p><b>100% completed</b> Core Expert Meeting was held in Samut-Songkran, Thailand with about 30 participants from Member Countries and SEAFDEC Staffs.</p> <p><b>50% completed</b> On-site trainings for tagging small pelagic fish were conducted as follows. Indonesia: 1-2 November, Brunei Darussalam: 19-20 November, Malaysia: 22-23 November, Thailand: 26-27 November, Vietnam: 4-5 December, The Philippines: 10-11 Dec, Cambodia: 13-14 Dec, Myanmar: 17-18 Dec</p>
<p><b>Project 2: Tagging Operation in the South China Sea and Andaman Sea.</b></p> <p>Activity 1: Poster making and tagging material purchasing</p>	<p>Nov-Dec 2007</p>	<p><b>50% completed</b> A standard poster format and layout has been distributed to all member countries for translation into their own local language during on-site training. Tag guns and tag are purchased according to the agreement during the First Core Expert Meeting.</p>
<p><b>Project 3: Data collection and analysis</b></p>	<p>2008-2010</p>	<p>No activity in 2007.</p>
<p><b>Project 4: Promotion/Developing of Database/Data Management Software</b></p> <p>Activity 1: Developing of Database/Data Management Software</p>	<p>Nov-Dec 2007.</p>	<p>Development database for tagging is in progress.</p>

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p><b>Project 1: Meetings/Workshops/Trainings for Effective Program Implementation</b> Activity 1: The Second Core Expert Meeting</p>	Oct 2008	<p>The Second Core Expert Meeting will be held in October 2008 in Kuala Lumpur, Malaysia with aims:</p> <ul style="list-style-type: none"> <li>- To discuss progress on the project implementation in 2008 and to formulate final research plan for tagging in the South China Sea and Andaman Sea from 2009 onwards.</li> <li>- To finalize data processing procedure</li> <li>- To discuss progress of tagging operation and new strategies to improve tagging operations</li> </ul>
<p><b>Project 2: Tagging Operation in the South China Sea and Andaman Sea</b> Activity 1: Tagging operation in the South China Sea</p> <p>Activity 2: Tagging operation in the Andaman Sea</p>	<p>Jul-Sep 2008</p> <p>Apr-Jun 2008</p>	<p>Tagging operation will be conducted at 15 sites facing the South China Sea. The target species are <i>Rastrelliger kanagurta</i>, <i>R. brachysoma</i>, <i>Decapterus maruadsi</i> and <i>D. macrosoma</i>.</p> <p>Tagging operation will be conducted at 6 sites facing the Andaman Sea. The targeted species are <i>Rastrelliger kanagurta</i> and <i>R. brachysoma</i>.</p>
<p><b>Project 3: Data Collection and Analysis</b> Activity 1: Data collection and verification</p>	Apr-Dec 2008	Information on number of fish tagged and recaptured will be compiled by all Technical Officers of participating SEAFDEC Member Countries. Data will be verified by Technical Officers of the project before entering into database that was developed by SEAFDEC-TD.
<p><b>Project 4: FADs and Sardine Information</b> Activity 1: Information and data collection</p>	Jan - Dec 2008	Supplementary information on present status of FADs operation (type, location, distribution, owner and number) and Sardine catch (gear, boat, method of operation and fishing season) in the South China Sea will be compiled based on the information/data collected during the first phase of Japanese Trust Fund II project from 2002 to 2006 for consideration of an appropriate management of purse seine fishery.

#### **4.2 Expected Outcomes**

- 1) Second Core Expert Meeting on tagging program for economically important small pelagic species in the South China Sea and Andaman Sea
- 2) Tagging operations in the participating SEAFDEC Member Countries
- 3) Compilation of information on the tagged fish recaptured
- 4) Training course on data handling, updating and processing
- 5) Formulation of final implementation plan of tagging program from 2009 onwards

## **PROGRAM DOCUMENT**

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in ASEAN Region

**Lead Department:** The Secretariat

**Lead Country:** Thailand

**Total Duration:** 2007-2009

### **1. INTRODUCTION**

One of the serious problems in achieving sustainable fisheries, especially for small-scale fisheries in ASEAN region is over-capacity of the sector; too many fishers competing each other over dwindling fisheries resources. Due to various difficulties on the establishment of appropriate fisheries management system in coastal areas in the ASEAN region, fisheries have been conducted under the open access regime (race to fish) in unregulated manner. The reducing trend of daily catch would worsen their livelihood, and lead to chronic status of poverty in the small-scale fisheries households. It is found that there are not many options to alleviate this status, especially in relation to the lack of alternate income earning opportunities other than fisheries in the rural fishing community. People might continue to be small scale fishers and tend to use illegal and destructive fishing gears and practices to desperately maintain their livelihood. Such vicious cycle would further aggravate their social, economic and financial status of small-scale fishers and ecological status of aquatic/fisheries resource base.

On the other hands, the obtaining maximum benefits out of fish and fisheries products in the fishing community to improve the fisheries livelihood has not effectively been achieved due to social and other problems. Traditional marketing system, in most cases, dominated by so-called “middlemen” purchasing fisher’s catch in the form of fresh in fishing communities for their various disposition purposes of fisheries products through their marketing channels. Fishers do not normally obtain the greater benefit out of their catch, if these are sold simply as fresh fish, especially in peak season. Furthermore, in most cases, they are not in the position to initiate small business using their catch to produce value-added products, considering their limited technical and financial capacity. In addition, even though the person who managed to produce fisheries value-added products, general competitive marketing situation of fisheries product developed in other areas or even by the large fisheries industries would provide negative factor to promote feasible economic activities in the rural areas.

Although it is understood that women is actively participated in fisheries even in the fishing activities, their level of involvement is always kept as informal basis and hardly recognized as important and potential stakeholders in rural economic activities. In this connection, the women’s group can be considered as underutilized valuable human resources in the community. Although the project is not specifically planned only for the women’s participation, but gender sensitive approach to the community members both men and women for the proposed activities will be taken, involvement of women’s group can be motivated and encouraged because these groups are not fully mobilized in various community activities.

In 1979, Mr. Morihiko Hiramatsu, the Governor of Oita Prefecture, Japan at the time proposed “One Village, One Products (OVOP)” movement to provide greater motivation for the rural potential people being community leaders to activate rural economy mobilizing various inputs unique and available in these rural communities.

Over 25 years, such movements have been successfully developed in either in Oita and other Prefectures, Japan, recognized as production of differentiated products, “One Village, One Products (OVOP)” and greatly mobilized rural people including women’s group for the

promotion of various vitalization activities of rural communities. It is also proved that women's groups have taken various leading roles especially from social aspect of the activities. With respect to the productions of handicrafts and food materials through OVOP movement, the women's groups have normally taken substantial role in the community.

Through the comprehensive Human Resource Development activities, the movements have reviewed specificity of the local community, not in the negative but positive aspects and identified the potential products and activities that can economically, financially and socially activate the respective rural communities. Such principles, especially in its bottom-up approach have been supported by numbers of developing countries as a mean to develop and activate rural communities' status, motivating the people and mobilizing the unique but locally available technical skills and materials.

These countries in ASEAN region promoted "One Village, One Products (OVOP)" concept as well as movements were Cambodia (One Village, One Product), Indonesia (Back to Village), Lao PDR (Neuang Muang, Neuang Phalittaphan), Malaysia (Satu Kampung, Satu Produk), Philippines (One Barangay, One Product), Thailand (One Tambon, One Product (OTOP)).

Especially, Thailand has developed "One Tambon, One Product (OTOP)" in its effective own way. The OTOP with specific objectives both on the effect to rural development and promotion of internationally tradable products has been successfully integrated and developed in shorter period and achieved special nation-wide supporting system coordinated and supported by the special unit established in Prime-Minister Office.

It might be difficult to promote international trade of fisheries products to be produced in rural fishing communities in their backyard. As safety of the food is a keen concern in the international society, application of stringent and high level trade regulations under WTO such as SPS (Sanitary and Phytosanitary Measures) and recommended measures including HACCP (Hazard Analysis Critical Control Points) will greatly handicapped for the successful promotion of these product in the international market. It is also too ambitious to quickly develop the system to meet the international requirements on sanitary and other related issues (i.e. packaging) considering the current technical and financial capacities and status of the women's group who would produce appropriate fisheries product in rural fishing communities. In this connection, outputs of the movement will be targeted to promote value-added but differentiated fisheries products and activities in local/ national markets (Aiming only one product rather than number one products). OVOP movement can therefore be more referable and usable than regional success case of OTOP, for the proposed project activities such as motivating the people's function and mobilizing women's group through appropriate HRD activities and development/ market policy of the project.

Above problem together with perishable nature of material (harvest from aquatic ecosystem) always provide negative factor to develop value-added product in the fishing communities. In addition, public support (government) tends to focus on the production/management side of small scale fisheries, not on the marketing side, due to the reason that this sector can be solely handled by industry themselves, although it was understood that marketing people involved in the small scale are not always kept good cooperation with fishers (middlemen).

It is understood that the promotion and marketing of value-added fisheries products requires cultural background. As normally, food habit is rather historically developed and conservative nature, special marketing strategy is required. ASEAN region, composed of 10 countries has developed their culture on fish eating habit in diversified manner in term of acceptance of various types of fisheries products. This has led to the regional directions to promote intra-regional trade as part of the ASEAN Economic Integration Policy and Roadmap for Fisheries Integration. Based on this recognition, regional promotional work of "One Village, One Fisheries Product (FOVOP)" would be accepted. In addition to such cultural background, the

most of ASEAN member countries has tested “OVOP” movement with different level of success.

## **2. PROGRAM**

### **2.1 Objectives**

#### **Development Objectives**

The development objective is to improve fisheries livelihood through motivation of the potential people in the fishing communities in ASEAN Member Countries through introduction and promotion of “One Village, One Fisheries Product (FOVOP)”.

#### **Project Objectives**

In order to achieve the above Development Objectives, the project will focus on the following detailed objectives through various HRD activities.

- 1) To enhance the awareness on the gender and development in the fishing communities, especially to clarify the role and function of women’s group for the development of small- scale economic activities in the community level;
- 2) To develop the regional strategy on the development and promotion of “One Village, One Fisheries Product (FOVOP)” especially the policy to support these activities through the government services;
- 3) To evaluate the needs and problem areas on the introduction and development of “One Village, One Fisheries Product (FOVOP)” in each ASEAN Member Country;
- 4) To identify the regional mechanism requirement to support the promotional work on “One Village, One Fisheries Product (FOVOP)”;
- 5) To provide basis to facilitate exchange of experiences among ASEAN Countries and experts, including experience from the case studies to develop recommendation for future FOVOP activities that could be later developed, which are suitable for each local situation in respective ASEAN Country.

### **2.2 Program description**

Currently there are no national policy/framework/guidelines to support the promotion of FOVOP in the ASEAN Region. Based on such similarity in their culture on fish eating habit and other social factors, exchange and sharing their experiences among ASEAN 10 countries in terms of motivation of the people, production of value added products and other activities specific to each locality, can be the regional advantages to promote the proposed movement, rather than promoted separately in respective countries. These can be achieved through development of the regional policy/framework and guidelines to support the initiative through development of the regional strategy on the development and promotion of “One Village, One Fisheries Product (FOVOP)”, especially the policy to support these activities through the government services. After the project completion, the Regional Guidelines and related strategies will be used as basis for the ASEAN Countries to apply and further promote and implement activities under their specificity and local situation.

At present, there is no effective mechanism to improve the livelihoods of fisheries household and initiate small-scale business in rural fishing communities in ASEAN region. The issues also inter-linked with fisheries problems as over-capacity and coastal fisheries management issue. Although the livelihood issues and poverty problem in rural fishing communities in most cases entrusted to the fisheries related government agency, their supporting programs are always very oriented toward and confined in very technical nature (i.e. using appropriate fishing gear, method to manage fisheries). Therefore, it might be appropriate to promote “One



Village, One Fisheries Product (FOVOP)” by introducing proved methodologies as OVOP/OTOP with appropriate marketing strategy to the ASEAN Region.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

Project/Activity Title	Duration	Remarks
<p><b>Inform the Member Countries on the new project for their preparation</b></p> <p>After signing the contract with ASEAN Foundation on 24 October, the Secretariat circulated the project proposal to the Member Countries to keep them informed and for their preparation and inputs for the first project activity that will be implemented in early 2008.</p>	Nov.-Dec. 2007	100% Completed
<p><b>Preparation of the 1<sup>st</sup> Regional Technical Consultation (RTC)</b></p> <p>As the first activity is the RTC which was planned to organize in early 2008, the preparation for the 1<sup>st</sup> RTC is going on. The 1<sup>st</sup> RTC aimed to consult and discuss among the Member Countries on the project objectives, regional policy on the issues and manner for the implementation of the planned activities, including type of activities, identification of beneficiaries, expected outputs, timing and venues of respective activities and responsibilities of parties concerned.</p>	Dec. 2007	50% Completed

### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

#### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p><b>1. The 1<sup>st</sup> Regional Technical Consultation (RTC) on the Promotion of “One Village, One Fisheries Product (FOVOP)”</b></p> <p>- The 1<sup>st</sup> Regional Technical Consultation (RTC) will be held to discuss among the regional participants on the project objectives, regional policy on the issues and manner for the implementation of the planned activities. Two government officers from each ASEAN Member Countries who are responsible for 1) gender and development and 2) coastal fisheries management, will participate to the RTC. RTC will share the experience in Japan (OVOP) and Thailand (OTOP) as a basis for the development of appropriate strategies for the promotion of FOVOP in ASEAN region. RTC also share the experiences on the gender and development in ASEAN region. It is also important to identify the required financial resources including through available micro-credit in the region, even though these requirement might be minimal, for the working capital of the economic activities to be identified.</p>	Feb. 2008	
<p><b>2. Development of the Materials for Training and Awareness Building Activities</b></p> <p>- Based on the outcomes of RTC, required materials for various HRD activities to be conducted in the project will be prepared by the SEAFDEC Secretariat and project experts. The required materials can be envisaged as follows.</p> <p>1) Draft strategy and guidelines for the promotion of FOVOP in ASEAN region including institution buildings of the women’s group in the fishing community. Special emphasis will be given to the needs of HRD activities to motivate community people to take appropriate leading role for the FOVOP movement;</p> <p>2) Draft strategy and guidelines for the support of government agencies on the promotion of FOVOP;</p>	Feb.– April 2008	

<p>3) Draft guidelines for the mobilization of the micro-credit in rural areas; and 4) Draft Guidelines on the Identification of the FOVOP Product</p>		
<p><b>3. Regional HRD Workshop on Identification of Potential and Problem Areas for the Promotion of FOVOP in ASEAN Region</b> - The Regional HRD Workshop on Identification of Potential and Problem Areas for the Promotion of FOVOP in ASEAN Region will be organized. Four government officers (two from central government and two from local government) will participate to the HRD Workshop. HRD activities will be conducted, using draft HRD materials first initiated at the 1<sup>st</sup> RTC and followed and prepared by the experts and SEAFDEC Secretariat. It is envisaged that through the exchange of experiences on the issues in the region in the Workshop, the level of awareness on the issues will be greatly enhanced among the participants. - The Regional HRD Workshop will also discuss about the implementation of the case studies (5 sites in the region) in selected ASEAN Countries and standardized methodologies of the case study. The countries that are going to conduct the case studies will be selected using the criteria including the followings. 1) The level of willingness and readiness of the countries; 2) The level of acceptance of the technical obligation including writing case study reports and translation of HRD material to local languages; and 3) The level acceptance of financial obligation under SEAFDEC cost share system on the implementation of the case study.</p>	<p>July 2008</p>	
<p><b>4. Case Studies on the Promotion of FOVOP in ASEAN Region (Local HRD Workshop)</b> - Under the HRD project, the case studies will be conducted by SEAFDEC in five selected sites of five Member Countries as Local HRD Workshop with the representatives of the identified women's group. The Local HRD Workshop will be similar to the Regional HRD Workshop on Identification of Potential and Problem Areas for the Promotion of FOVOP in ASEAN Region", but mainly using local languages and materials. More detailed and localized potential and problem areas will be identified through the exchange of experiences of the participants. - The objectives of the Local HRD Workshop are 1) to further identify the potential and problem areas; 2) to verify the applicability of the HRD materials (several guidelines and strategies developed at the regional level) in the selected ASEAN Member Countries; and 3) to recommend future potential post-project activities that would be implemented by respective countries.</p>	<p>Oct. 2008- Mar. 2009</p>	
<p><b>5. Revision of HRD Materials</b> - The responsible officer of the central government will revise the regional HRD materials including strategies and guidelines accommodating the findings through the local consultation meeting. - Based on the revised HRD materials submitted by the responsible officers of the central government that conducted case studies, the Secretariat will revise the regional HRD materials (including Strategies and Guidelines) so as to reflect the outcomes of the case studies.</p>	<p>June-July 2009</p>	
<p><b>6. The 2<sup>nd</sup> RTC on the Promotion of FOVOP in ASEAN Region</b> - The 2<sup>nd</sup> RTC on the Promotion of FOVOP in ASEAN Region will be organized. Four government officers (two from central government and two from local government) will participate to the 2nd RTC. HRD activities will be conducted using the revised HRD materials</p>	<p>Aug. 2009</p>	

<p>accommodating the outcomes of the case studies in the selected countries and localities. Through reviewing the HRD materials and exchanging the experiences of the participants, these HRD materials will be finalized as the regional strategies and guidelines including the followings for the promotion of FOVOP movement.</p> <ol style="list-style-type: none"> <li>1) Regional Strategy and Guidelines for the promotion of FOVOP in ASEAN Region;</li> <li>2) Regional Strategy and Guidelines for the Support of Government Agencies on the Promotion of FOVOP;</li> <li>3) Regional Guidelines for the Mobilization of the Micro-Credit and Marketing Promotion in Rural areas; and</li> <li>4) Regional Guidelines on the Identification of the FOVOP Products</li> </ol> <p>- The 2<sup>nd</sup> RTC will also serve as a forum for sharing experiences among the Member Countries (including experience from both government and non-government representatives during the case studies) to support future national activities to be implemented later in respective country. In addition, the 2<sup>nd</sup> RTC will also discuss and recommend future possible post-project activities that would be implemented by respective countries (i.e. once specific products are identified, a technical training on proper production/handling -- post-harvest methods/technologies – should be conducted to ensure quality of products).</p> <p>- The 2<sup>nd</sup> RTC will further discuss the development of regional network to promote FOVOP in ASEAN region, in the long run, after the project implementation. As SEAFDEC develop its technical competence in term of required technologies for the development of FOVOP products including post-harvest technologies, fishing and post harvest technologies, aquaculture technologies and fisheries management and conservation of aquatic environment, it can be acted as core function of the network linking with the respective national networks, if such arrangement is developed by the interested countries on the promotion of FOVOP.</p>		
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### 4.3 Expected Outcomes

Awareness building on how the Fisheries OVOP (FOVOP) can provide impact on the following issues, will be greatly enhanced through the successful project implementation

- 1) Improvement of fisheries livelihood;
- 2) Impact on the over-capacity;
- 3) Gender and development in the fishing community;
- 4) Active participation of women’s group on the community based business activities; and
- 5) Recommendation on identified future FOVOP activities to be implemented in respective ASEAN Country.

Through the proposed HRD activities, the following strategies/policy and guidelines will be clarified and understood among the various stakeholders in the region.

- 1) Regional strategy and guidelines for the promotion of FOVOP in ASEAN Region, especially on HRD motivating local people and encouragement for the appropriate institutional set up including women’s group;
- 2) Regional strategy and guidelines for the support of government agencies on the promotion of FOVOP;
- 3) Regional guidelines for the mobilization of the micro-credit and marketing promotion in rural areas; and
- 4) Regional guidelines on the Identification of the FOVOP Products.

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Information Collection of Highly Migratory Species in Southeast Asia Waters (New)

**Lead Department:** TD

**Lead Country:** The Philippines

**Duration:** 2008-2012

### 1. INTRODUCTION

Tuna species are ones of the highly migratory species, have the greatest commercial value of the tunas and billfish resource of the World. In the Southeast Asia waters tunas are also commercially important marine resource for exports to the Japan and EC countries, as well as for the domestic consumptions as valuable protein resource. Linkage to the neighboring Regional Fisheries Management Organization (RFMOs) namely IOTC and WCPFC, Southeast Asian Region is identified under those RFMOs. At present, stock structure of tuna distributed in the region particularly in the south china sea are still unclear and without the knowledge of the real stock structure, appropriate resource management at national level cannot be achieved. Tuna longline and artisanal purse seine associated with FADs are the most important gears operated in the in the South China sea areas and neighboring sea down to the West-central Pacific ocean. Under such a situation, SEAFDEC proposed to conduct the information collection of the tuna production harvested in the South China Sea covering three main countries namely The Philippines, Vietnam and Indonesia and other SEAFDEC member countries.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To evaluate the Status of tuna fisheries in the South China Sea and West Central Pacific Ocean included in the EEZ of the following countries the Philippines, Indonesia, Vietnam
- 2) To develop tuna database based on tuna landing sites information
- 3) To conduct the observer program for data collection onboard Commercial fishing vessels
- 4) To form of the working group party on information collection of tuna fisheries from concerned member countries

#### 2.2 Program description

Information Collection of Highly Migratory Species in Southeast Asia Waters project for 2008 will focus on the information gathering of the tuna species in the South China Sea and the West Central Pacific Ocean whereas the areas included many sea areas in the EEZ of SEAFDEC member countries particularly the Philippines, Vietnam and Indonesia that have high potential on tuna harvesting. The main objectives of the project are to clarify and assess status of tuna fisheries in the mentioned areas through various methods on the information gathering in close collaboration with the concerned member countries. Through the assistance of national focal point and closed collaborative work with the member countries, long term tuna fisheries management plan should be discussed and developed in the later state.

### 3. PROPOSED ACTIVITIES FOR THE YEAR 2008

Program/Project /Activities	J	F	M	A	M	J	J	A	S	O	N	D
<b>Information Collection of Highly Migratory Species in Southeast Asia Waters</b>												
<b>1. Consultation/Working Party Meeting</b>												
- Consultation visit/preparatory work for data collection and follow-up/progress implementation												
- 1 <sup>st</sup> Working party meeting for annual plan finalization												
- Participation of the national/international tuna conference/ meeting for data collection												
<b>2. Development of Tuna Database</b>												
- Review data worksheet for information collection and Designing all data inputs and outputs of the outcome												
- Development of Regional database for Online Access												
<b>3. Identification of Tuna Fishing Grounds (no Act)</b>												
<b>4. Data collection from Landing/Observer</b>												
- Data Collection from Landing												
- Data analysis												

#### Expected Outcome:

- 1) Status of tuna fisheries in the South China Sea and West Central Pacific Ocean included in the EEZ of the following countries the Philippines, Indonesia, Vietnam
- 2) Tuna database based on tuna landing sites information
- 3) Conduct the observer program for data collection onboard Commercial fishing vessels
- 4) Formation of the working group party on information collection of tuna fisheries from concerned member countries

## PROGRAM DOCUMENT

**Program Category:** Program under the ASEAN-SEAFDEC FCG Mechanism

**Program Title:** Development of Regional Database for Fishery Management (New)

**Lead Department:** TD

**Lead Country:**

**Duration:** 2008-2012

### 1. INTRODUCTION

One of the big problems in regional information collection and management of fishery information/data is the available of data management system/database at the national level. SEAFDEC, based on the national data input, has faced many problems in delayed publishing of the Regional Fisheries Statistics long time ago. For example, SEAFDEC has published annually of Fishery Statistical Bulletin for the South China Sea since 1976, most of the information were in hard copies format and always delay for 2-4 years. In addition, to use and apply those information the user generally need to reanalyze from the electronic data format. This problem may not occurred and waste time of user, if the fishery database is available.

So far, not many member countries have developed and utilized their own fisheries database system, in contrast many countries still use to collect data in the electronic worksheet or hard copies. For the later methods, it can reduce opportunity to get the evaluation of annual fishery status within short time compare to those who use fishery database.

To make use of the Regional database efficiently and very useful for users in the Region and global level, standardization of the data and information from national fisheries data input are need. Appropriated fishery database system which can be also utilized by member countries, and can automatically generate the general outcome/report are very much required.

Under the trust fund 2 on information collection for sustainable small pelagic fisheries in the South China Sea TD in cooperation with the MFRDMD has initiated develop the regional database to support the data collection of both landing data and biological data. The database system could generate the catch landing results by areas, period of times, and by species. In addition, from the biological data input, the system could also generate some results of biological parameters. The system was developed for online data input, only member countries users can access the system through name account and password. Before terminal the project, in order to support member to continue their works by utilizing the database, therefore TD has further developed the Software of database system based on the Regional version. This database software will include all pelagic species and landing sites up to user's need. TD plan to release the 1st version software by 2007.

With regard to the fishery statistic database system, Td has initiated in developing the system based on the Fishery Statistical Bulletin for the South China Sea since 2006 in order to make use the Regional information collected from member countries. However, the system is not complete yet due to changing of the original worksheet and standardization of data.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To further develop/upgrade and promote the Regional Database of Pelagic in the Southeast Asia Waters based on the actual survey and landing site collection based on the studied outcomes
- 2) To develop Regional Fisheries Statistic Database in Southeast Asian Region

- 3) To enhance human resources capacity in using of the Regional Database for fishery management through training program
- 4) To support less developed countries on the use of Fisheries Statistical Database

## 2.2 Program description

One of the best fisheries management tools is to have their own database management system in data collection whether fishery statistic system or database for actual fishing activity. In the project make use of our expertise by developing the Regional database and introduce to member countries especially less developed countries will be implemented. In directly, this will facilitate the present and future data collection in long term. In addition, the project will also focus on the database for tagging program under the “Tagging program for Economically Important Species in the SCS and Andaman Sea” managed by MFRDMD in collaboration with TD.

## 3. PROPOSED ACTIVITIES FOR THE YEAR 2008

Program/Project /Activities	J	F	M	A	M	J	J	A	S	O	N	D
<b>Development of Regional Database for Fishery Management</b>												
<b>1. Development of Regional Database</b>												
Database development (various types of database)												
<b>2. Building the Human Resources Capacity on utilization of Database</b>												
participation in the Workshop for Tagging												
<b>3. Information Dissemination</b>												
Publication (Manual for Databases)												

### Expected Outcome:

- 1) Development and promotion of the Regional Database of Pelagic Resources in the Southeast Asia Waters based on the actual survey and landing site collection based on the studied outcomes
- 2) Development of Regional Fisheries Statistic Database in Southeast Asian Region in order to support less developed countries on the use of Fisheries Statistical Database
- 3) To enhance human resources capacity in using of the Regional Database for fishery management through training program
- 4) To support the data analysis from tagging program using Tagging Database.

**Annex 6**

**OTHER PROGRAMS/ACTIVITIES IMPLEMENTED BY SEAFDEC**

The program/activities that have been implemented by SEAFDEC Departments are reported as **Appendix 1 to 5**. The programs/activities that have been finalized and negotiated with donors/agencies but not in the scope of Departmental program and cooperation of ASEAN-SEAFDEC FCG Mechanism, list of programs are as follow:

<b>Other Programs</b>	<b>Responsible Department</b>
1. Promotion of Set-Net; an Eco-friendly Fishing Gear of Sustainable Coastal Fisheries Management	TD
2. Information Collection for Economical Important Species: as Surimi Raw Materials	TD
3. Cetacean Research in Southeast Asia Waters: Whale Watching Program	TD
4. Collection of Information about International Support in the Region	TD
5. Promotion of Sustainable Freshwater Aquaculture for Rural Communities	Secretariat



## PROGRAM DOCUMENT

**Program Category:** Others Programs/Activities

**Program Title:** Promotion of Set-Net, an Eco-Friendly Fishing Gear for Sustainable Coastal Fisheries Management

**Funding Source:** Japanese Trust Fund

**Responsible Department:** Training Department

### 1. BACKGROUND/GOAL OF THE PROGRAM FOR THIS YEAR (2008)

The success of the Set-Net fishing technology transfer for sustainable coastal fisheries Management in Southeast Asian Region Case Study in Thailand was evaluated at the end of two years project in 2003-2005. The Small-scale fishermen on the coastal area in the Set-Net Project site were satisfied then the project is continuing under collaboration between the local fishermen and the local office of the Department of Fisheries, (Mae Rumpheung small-scale fisher groups and Eastern Marine Fisheries Research and Development Center (EMDEC) of Rayong Province. Set-Net was recommended to be an applicable fishing gear to promote Coastal fisheries Management and Resources Enhancement. Furthermore, it was recommended to have the furthers study to develop an appropriate fishing techniques for the tropical waters in the region

Set-Net plays an important role in the fishermen's cooperative activities. It could create many collaborative works among the fishermen and also local officers. However Set-Net fishing gear is still a new fishing technique for the local fishermen in this area, it needs more improvement in both fishing techniques and operation methods. Also it affect to the present fishing activities and environment needs more study in details.

Two years follow up survey has conducted in 2006 – 2007 “Follow up activities and Improvement of Set-Net Technology Transfer for sustainable Coastal Fisheries Management” was carried out continuously after the first phase of Set-Net project. Both fishing techniques and fishermen skill have a lot of improvement, gear designed, operation techniques and fisher group management have developed.

The Administrative Management Committee of Mae Rumpheung Fisher Group has function well, and effectiveness. The second set-net was installed on the same area with one mile away from the first unit under the fisher group management themselves. The fisher group management of Mae Rumpheung Set-Net Fisher Group need more technical advice to improve it. Among the conflicts and problems of coastal fisheries in the region, community-base management is one of the program in being promoted to solve those problems. Coastal fisheries management by local fishermen is also an expected program could be succeeded for the coastal fisheries resources management plan. Collaborative activities of the local fisherman on set-net project are the good process to strengthen the cooperative of fishermen and set-net is an Eco-Friendly fishing gear for the future.

Common policy development for the sustainable coastal fisheries management by local fishermen has been develop to some level, such as set up of the fisher group management and collaborative activities, Administrative and Management Committee, local marketing system, etc. The project target going to challenge the fisherman cooperative in future and set-net fishing will be an appropriate and eco-friendly fishing gear for their coastal waters.

## 2. OBJECTIVES

- 1) To promote set-net fishing technology to be a tool of sustainable coastal fisheries management.
- 2) To develop an appropriate set-net fishing techniques for tropical shallow waters operation.
- 3) To develop the common policy concept of fisheries management of stationary fishing gear such as set-net through the project.
- 4) To assist the member countries on development of sustainable coastal fisheries management.
- 5) To assist Japanese expert's program on the set-net fishing technology transfer to region.

## 3. JUSTIFICATION OF EACH ACTIVITY FOR THE YEAR 2008

### **Activity 1: Technical Assistance and Technology transfer through capacity building activities.**

Technical advisory trip to member countries, Indonesia will be made in collaboration with Tokyo University of Marine Science and Technology (TUMSAT) and the Department of fisheries of Indonesia (January 2008).

### **Activity 2: Improvement of Set-Net fishing gear technology for shallow water**

Shallow water type of set-net, Choko-ami will be introduced for experimental study in the coastal Mari culture area Chonburi (June, August and October 2008).

### **Activity 3: Human resource development of key person will be conducted through regional training program**

Human resources development for key person will be conducted through regional training program for two weeks at the Training Department. The course will be conducted in early of April 2008.

## 4. EXPECTED OUTPUTS

Set-Net fishery will be accepted as an environmental friendly fishing gear for sustainable coastal Fisheries Management through out the region.

## 5. PROGRESS AND STATUS

Set-Net Project had been carried out by SEAFDEC/TD since April 2003 under Japanese Trust Fund program, it has continued until the present. Achievements of the project are as follows:

- The fishermen in the project could carry out the set-net fishing activity with better income from the catch management by themselves. Average income of the group was improved from 2,000.- baht/day in 2004 to 6,500.- baht/day in 2007.
- Set-Net fisher group was registered in the **Micro Enterprise Corporation** of Local government (Rayong Province) with the operating budget over 200,000.-baht and 16 members in the group.
- The set-net fishing technology transfer for sustainable coastal fisheries management has introduced to Indonesia, the project was carried out in South Sulawesi in Bone, local fishermen training has started in October 2007. It is three year project support by JICA and carried out in collaboration with Tokyo University of Marine Science and Technology, Hasanuddin University, Pallettee fisheries high school and Indonesian local fishermen of Pallette, Bone.

**Propose program for 2008 of Set-Net Project** is to give technical assistance to Indonesian set-net project, introduce the shallow water type set-net "Choko-ami" to manage the fisheries resources in Mariculture framing area in the coastal. And organize one regional training course

on Set-Net fishing technology transfer for Sustainable Coastal Fisheries Management for two weeks period.

## PROGRAM DOCUMENT

**Program Category:** Other Programs/Activities

**Program Title:** Information Collection for Economical Important Species: as Surimi Raw Materials

**Funding Source:** Japanese Trust Fund

**Lead Department:** TD

**Duration:** 2006-2008

### 1. INTRODUCTION

Under the project on Information Collection of Economically Important Species as Surimi raw-materials in the Southeast Asian Region, the status of surimi industry is one of the most important issues in this project needed to be clarified. Surimi is one of the important fisheries productions which were introduced to the Region for more than two decades. Based on survey in 2006, nowadays a total of 80 Surimi Plants are located in the region; 26 in Thailand, 15 in Vietnam, 3 in Myanmar, 8 in Indonesia and 15 in Malaysia. Due to depletion of the fisheries resources, particularly the demersal resources in many countries in the region, this directly impact to the surimi industry.

Recently, it is found that there is a lack of stable supply of the raw materials in many countries. Also, this species is exported from the region to international market including Japan as an important material for surimi products, and its production trend and sustainable production in the future is international concern. Taking into consideration importance of sustainable use of these economically important species as surimi raw materials for SEAFDEC member countries, the information collection for these species in the region are taken into accounts.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To continue on information gathering and evaluate on the existing potential fisheries resources of some economically species as Surimi raw materials in the Southeast Asia through the actual survey by research and fishing vessels
- 2) To conduct the observer program in closed collaboration with the member countries on data collection from commercial fishing vessels operated in the region to check to status of fishery resources.
- 3) To discuss and disseminate the progress report on existing potential fisheries resources of some economically specie as Surimi raw materials through the Technical Consultation Meeting.

#### 2.2 Program Description

Our reviewed works on the surimi industry in the Southeast Asian region shows that only 5 countries namely; Indonesia, Malaysia, Myanmar, Thailand and Vietnam have involved in surimi processing for export. Depletion of fisheries resources especially surimi raw material species will affected to the demand of surimi industry. However, in some particular sea areas in the region, there still have the potential resources to supply to the existing industries. Therefore investigation of the status of fisheries resources as surimi raw material is one of the important tasks in this project. In cooperation with the technical working group on data/information gathering, the observation program on the commercial fishing boat in different fishing grounds of member countries will be conducted under the project in 2008.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

#### Project Activities

Activities	Duration	Status
<b>Activity 1: Information Collection</b> 1.1 Consultation visit for data collection (Malaysia) 1.2 Participation of international symposium 1.3 Review on the research survey in the past for searching of new resources in different fishing grounds	Jan-Dec	70% (information collection were collected through local focal point in Malaysia)
<b>Activity 2: Data Analysis and Drafting final report</b> 2.1 Evaluate for the Resources Status, Market 2.2 Drafting Final Report 2.3 Regional Workshop on the Status of Surimi Industry and Status of Resources	Jan-Dec 07	40% The Regional Workshop will be held in Mid December 2007
<b>Activity 3: Information dissemination</b> 3.1 Final Report on Status of Surimi Industry and Status of Resources 3.2 Poster on Status of Fisheries Resources 3.3 Information Dissemination	July-Dec	40% Proceedings of the paper will be finalized and published in end 2007

### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

Activities	Duration	Remarks
<b>Activity 1: Workshops/Consultation Visit</b> Working Group Meeting for discussion and progress on the outcomes from observer program, and information gathering on the existing potential fisheries resources of some economically species as surimi raw materials will be organized. The technical focal point group from each country will be established to coordinate on the information gathering. The consultation visit on the way of data collection especially from commercial fishing vessel will be conducted to make ensure implementation along line with the plan.	Mar-Nov.	
<b>Activity 2: Supporting of Actual Survey, Data Collection and Data Analysis</b> The collaborative research survey on fisheries resources survey at national and regional levels will be conducted in cooperation with the national research program of each member country using of MV SEAFDEC2 (under the cost-shared policy for M.V. SEAFDEC2) or other national research vessel(s). The survey areas will be focused in the EEZ of member countries and/or trans-bordering areas particularly in both trawlable and un-trawlable grounds. The results from the surveys will be analyzed at the regional levels.  To conduct the observer program and monitoring the catch data from commercial fishing vessels operated in both the EEZ and other coastal states under the right through fishing licensing.	Jan- Dec.	

To assist member countries on data analysis, which are related on the fisheries resources as surimi raw material.		
<p><b>Activity 3: Production of information packages</b>  Information dissemination through publication and SEAFDEC web-site as are follows:</p> <ul style="list-style-type: none"> <li>• Status and potential fisheries resources of some economically species as surimi raw materials</li> <li>• <i>Posters on Surimi Raw Materials in the SEA Countries</i></li> <li>• <i>Posters on Surimi Industry in the SEA Countries</i></li> <li>• Others CD materials/information package</li> </ul>	May-Oct.	

**Expected Outcome:**

Updated information gathering and evaluation on the existing potential fisheries resources of some economically species as Surimi raw materials in the Southeast Asia through the actual survey by research and fishing vessels

**PROGRAM DOCUMENT**  
(Revised after PCM and adopted by *ad referendum*)

**Program Category:** Others Programs/Activities  
**Program Title:** Cetacean Research in Southeast Asia Waters: Whale Watching Program  
**Lead Department:** Training Department  
**Funding Source:** Japanese Trust Fund  
**Lead Country:** -  
**Duration:** from 2008

## 1. INTRODUCTION

In Southeast Asian Region, we familiar with cetacean as dolphin larger than whale. Many questions are always raised up that “do we have whale in our country/region”. People always think that whales are highly migratory species in the Ocean not on the continental shelf of the region. Not many researches on the cetacean have been conducted in particular whales. Why and when do whales migrate to the region in particular coastal habitat? What are they doing in the coastal habitat? Some push-net fishermen operated near shore for small shrimp in upper gulf of Thailand said that “large size of whale comes to this area every year to feed small fishes. Fishermen believed and respected to whale as GOD from the sea, they never harm to whales. Fishermen do not notice that how whale affects to the coastal habitat. They also don’t know how much small fishes and shrimp were taken away from the coastal habitat. Same practices may occur in many countries in the region, such as Myanmar because it was found many whale (larger than 20m long) came close to coastal areas and death on the shore at almost the same period in 2005.

Most of the coastal habitat where whale migrate to are identified as nursery and spawning grounds or Fishery Refugia sites as their feeding grounds. Taking into accounts, since in the Southeast Asian Region, fisheries resources have being declined, a way to enhance fisheries resources and fishing grounds is to prevent/protect the nursery and spawning habitats. To do this, investigation of the existing all cetacean species such as whale, dolphin and porpoise are urgently need whether by review the existing information or by sighting observation.

Regarding this SEAFDEC/TD propose this project on the Cetacean Research in Southeast Asian Waters.

## 2. PROGRAM

### 2.1 Objectives

The objective of the program is to collect scientific information on the distribution and composition of Cetacean species in Southeast Asian Waters. The actual survey data would be collected from the sighting observation program using the M.V. SEAFDEC 2. In addition, the existing information of all cetacean species found in the region including marine and freshwater species would be also collected.

### 2.2 Program Description

The actual survey on the whale watching program would be conducted based on the MV SEAFDEC2 existing cruise plans from SEAFDEC to member countries or among member countries route. In 2008, there are expected to conduct the survey in 4-5 cruises within four-five countries namely Myanmar, Indonesia, Brunei Darussalam, the Philippines and Vietnam (only

for Vietnam survey will be confirmed later).

For the existing information on cetacean found in the EEZ of member countries whether marine species and freshwater species, including some accidentally death of cetacean on the coastal areas, those information would be collected for further analysis on the species composition. The expected output from the program will be as follows:

- 1) Inventory of cetacean namely whale and dolphin found in the Southeast Asian Waters through the whale watching program by M.V. SEAFDEC 2
- 2) Information gathering of the accidentally death of cetacean on the coastal areas of the region
- 3) Regional viewpoint on the existing Cetacean and their distribution.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

This is a new program since 2008

### 4. PROPOSED ACTIVITIES FOR THE YEAR 2008

Project/Activity Title	Duration	Remarks
<p><b>Activity 1: Consultation Visit and Preparatory Works</b>                      Consultation visit to Japan for Collaborative arrangements of the whale watching program by MV SEAFDEC2 and national Research vessels will be made in the 1st quarter of 2008. The objectives are to discuss with the Japanese expert on SEAFDEC whale watching program in the Southeast waters based on M.V. SEAFDEC cruises of 2008, in addition to consult and invite Japanese expert as a trainer to build the SEAFDEC human resources capacity on identification of cetacean through watching program in near future.</p> <p>Preparation for equipments and survey manual</p>	Jan- May	
<p><b>Activity 2: Information Gathering and Actual Survey by Research Vessels</b>                      Based on the utilization of MV SEAFDEC2 by SEAFDEC member countries in 2008, there are 4-5 research cruises will be conducted. Regarding this all cruising routes of MV SEAFDEC2 will be performed by whale watching program. In the 1<sup>st</sup> or 2<sup>nd</sup> cruises, a Japanese expert will be invited to join and transfer know-how on cetacean identification to SEAFDEC researchers.</p>	Jan-Oct.	M.V. SEAFDEC 2 plan of 2008 will be finalized by end of DEC
<p><b>Activity 3: Data Analysis and Information Dissemination</b>                      Data from the whale watching program and information gathering will be analyzed focusing on the list of cetaceans and their abundance found in the Southeast Asian waters. The preliminary outcome from the project will be drafted.</p>	May-Dec	

#### Expected Outcome:

- 1) Inventory of cetacean namely whale and dolphin found in the Southeast Asian Waters through the whale watching program by M.V. SEAFDEC 2
- 2) Information gathering of the accidentally death of cetacean on the coastal areas of the region
- 3) Regional viewpoint on the existing Cetacean and their distribution.
- 4) Regional Cetacean Database of the project for further dissemination and share to member countries.



## PROGRAM DOCUMENT

**Program Categories:** Other Programs/Activities

**Program Title:** Collection of Information about International Support in the Region

**Funding Source:** Japanese Trust Fund

**Lead Department:** Training Department

**Total Duration:** Year 2008

### 1. INTRODUCTION

SEAFDEC continues to play an important role in developing sustainable marine capture fisheries and coastal fisheries management for Member countries. In response to the SEAFDEC Strategic Plan and the ASEAN Resolution and Plan of Action adopted at the ASEAN-SEAFDEC Millennium Conference, many SEAFDEC activities are focused on improving regional coordination across areas including human resource development, research, resource management and policy development.

Increasingly, international organizations, NGOs and individual donor countries are implementing programs and activities in coastal and fisheries resource development and management in the region. While this trend reflects recognition of the importance of sustainable coastal and marine resource management in South East Asia and the support is welcomed by SEAFDEC Member countries, it is in the best interests of all to avoid duplication and cooperate in possible projects across areas.

At the institutional level, the cooperative use of resources is an important issue to SEAFDEC. Given the broad geographical area in which the organization operates, and the range of issues it faces, this is no surprise. Cost-efficiency is an important consideration in the development and implementation of SEAFDEC programs, and the organization needs to be aware of external activities, resources and sources of assistance in planning its activities.

To this end, SEAFDEC aims to create an information system that will act as a resource base in evaluating the range of activities, resources and sources of assistance in Southeast Asia. This system will be useful in identifying priority areas for the development of new projects and collaboration. It will also contribute to the successful implementation of SEAFDEC's initiatives in improving regional coordination across area including human resource development, research, resource management and policy development. The result from project implementation will be presented via TD homepage.

### 2. PROGRAM

#### 2.1 Objectives

- 1) To collect information about international support in the region to support international coordination and consideration of future programs and activities
- 2) To create and update international support information database via TD homepage
- 3) To seek more collaboration between SEAFDEC and others donor agencies

#### 2.2 Program Description

In the year 2008, TD is planning to continue collection of information about international support in the region. The project implementation in this year will emphasize the collection of information from the Internet. TD adjusted new project activities by consideration based on

backward experience. The new project activities will be available and sustainable to promote the database for SEAFDEC member countries. Project activities to be conducted during 2008 consist of Collection of Information data and Creation and Updating Information Database.

### 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

#### 3.1 Communication with focal points in member countries and other institutions

The information collection questionnaire survey was designed and 80 questionnaires were distributed to member countries and other institutions network. The result was analyzed and uplinked to internet database.

#### 3.2 Consultation Meeting

TD established new network and communicated with donors and other organization. TD visited international donors to have a consultative meeting, sharing and exchanging information between SEAFDEC and them.

#### 3.3 Collection of information from internet

TD searched and collected the information data on international supports in the region and compiled the information on international meetings and events concerned with fisheries via the Internet. The data was updated and presented on TD website.

### 4. PROJECT ACTIVITIES

Project/Activity Title	Duration	Remarks
1. Communication with focal points in member countries and other institutes	Jan-Dec	90%
2. Consultation Meeting	Aug	20%
3. Collection of information from internet	Jan-Dec	Completed

### 5. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

Project/Activity Title	Duration	Remarks
1) Collection of information data	Jan-Dec	
2) Creation and Updating of Information Database	Jan-Dec	

## PROGRAM DOCUMENT

**Program Categories:** Other Programs

**Program Title:** Promotion of Sustainable Freshwater Aquaculture for Rural Communities

**Lead Department:** The Secretariat

**Lead Country:** Thailand

**Total Duration:** 2008

### 1. INTRODUCTION

Freshwater aquaculture has been practiced in Southeast Asia for centuries, providing a livelihood to rural people and ensuring a sustainable supply of fishery products to local populations and food security. Small-scale aquaculture is still contributing enormously to the economy and the society.

The Southeast Asian Fisheries Development Center (SEAFDEC) has long been focused on marine fisheries, reflecting the original members of the organization. Considering the expansion of the SEAFDEC membership and the promotion of new mandates, SEAFDEC is now looking into the development of rural freshwater aquaculture. Series of activities will be promoted under “Promotion of Sustainable Freshwater Aquaculture for Rural Communities”.

The two largest constraints to rural aquaculture are limited knowledge of technology and limited capacity of service providers at all levels. The main activity to be undertaken under the project implemented by SEAFDEC Secretariat on the “Promotion of Sustainable Freshwater Aquaculture for Rural Communities” focuses on promoting a form of aquaculture that could reach the poor in *remote* rural areas in Southeast Asia where people have been long ignored due their isolation from the most basic infrastructure. Community-based aquaculture has been identified as the mean to achieve such end. Through the regional training, SEAFDEC will encourage an exchange of experience and build the capacity of key extension staff from the member countries through the mobilization of regional capacity. Clearly the most important people who require training are the farmers and communities themselves, but there is a need to focus first on service providers, especially on trainers that can pass on the skills to extension people at the national level.

SEAFDEC recognize the importance to learn from past trainings and achievements, and to build upon these rather than reinventing the wheel as highlighted by the earnest efforts put into building a collaborative effort with more experienced organizations in the region, such as AIT, AQD, Thai DoF, MRC and WWF. Moreover, it is also expected that the project can bring something new into the picture: the region-wide approach of SEAFDEC, which will bring in contact people from different places and contexts and promote an exchange of experience throughout the region.

It is assumed that appropriate methods and technologies for each local/national contexts of the region already exist and do not need to be developed, although they will need to be tested in the local context, and ‘adapted’ before being imported. As such, an important project’s activity was done to compile the existing regional competence and experience in the matter of interest and thereafter share it with the member countries for their interpretation on how these can be adapted to their respective conditions.

As a first step before undertaking physical activities and promoting sustainable aquaculture for rural communities, a review of regional needs, development context and requirement, together with the identification of most common constraints and needs, was undertaken during the

project implementation in 2007. Considering the lack of interest from the member countries for a pure technical training on livestock-fish farming, some research and reviewing efforts were put into looking for a more appropriate direction. In the aim to really achieve poverty alleviation and thus reaching the poor, a proposal was developed aiming at promoting fish farming in remote rural areas of Southeast Asia. While this keeps an obvious linkage with the integration of aquaculture with agriculture including livestock husbandry, the main identified mean to do so is through a community-based approach.

The 1<sup>st</sup> Joint Regional Training on Community-based aquaculture for Remote Rural Areas of Southeast Asia was successfully organized in Lao PDR in 2007. The training was able to test and developed Handbook and Reference materials for Community-based Aquaculture for Rural Development in Southeast Asia as well as Reports of discussion and fieldwork practices on issues and consideration for successful community-based aquaculture for rural development. All of these training outputs will be published and disseminated as a future regional reference on the topic.

Based on the training conducted, the participants expressed their satisfaction to the training arrangement and indicated that their expectations were fulfilled. In addition, it was commended that joint organization of the training among various organization was good and should be supported and this is the effective way of learning and sharing of information. Finally, it was recommended that areas of future projects by SEAFDEC on community-based aquaculture for remote rural areas of Southeast Asia to have echo regional training once a year.

## 2. PROGRAM

### 2.1 Objectives

Most of the poor farmers in Southeast Asian countries are located in remote rural areas, far from cities and infrastructure, and they depend almost exclusively on agriculture and natural resources, especially aquatic, while being deprived of most services. Those farmers are usually disadvantaged in terms of access to services, resources and limited infrastructure. In this basis, the project will focus on promoting means for those people to make their entry into aquaculture by promoting community-based fish farming and integration of aquaculture with agriculture, effectively aiming to achieve:

- Improvement of human nutrition and food security
- Reduction of vulnerability and risk of rural households or poverty alleviation
- Equitable income and employment
- Participation and empowerment of villagers in managing their resources, with a better utilization of the village resources
- Reduction of requirements for physical labour and empowerment of women

## 3. PROGRESS OF ACTIVITIES IN THE YEAR 2007

Project/Activity Title	Duration	Remarks
Preparatory Meeting on Promotion of Community-based Fish Farming in Remote Rural Areas of Southeast Asia to discuss and work out a curriculum, identify resources persons and responsibilities, Training Materials as well as working out a timeframe and arrangement for a follow-up Training	Jan 2007	100% Completed
Prepared the Training Materials	Feb.-June 2007	100% Completed

A visit to Lao PDR for Preparation of the Training Venue and coordination with resource persons and agencies concerned	May 2007	100% Completed
A two-week Joint Regional Training on Community-based Aquaculture for Remote Rural Areas of Southeast Asia, in Lao PDR	July 2007	100% Completed

#### 4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

##### 4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p><b>Activity 1: Preparatory Meeting for the 2<sup>nd</sup> Joint Regional Training on Community-based Aquaculture for Remote Rural Areas of Southeast Asia</b></p> <p>Based on experience in conducting the 1<sup>st</sup> Joint Regional Training in 2007, the preparatory meeting among various organization and resource persons will be organized tentatively planned for 2 days in Vientiane, Lao PDR. It is aimed to discuss in detail to work out and modify a curriculum based on the suggestion made for the training in 2007, as well as working out responsibilities and timeframe for the conduct of the 2<sup>nd</sup> Joint Regional Training. The modalities of these trainings would be discussed and finalized during the Meeting.</p>	February/March 2008	
<p><b>Activity 2: Preparation of training materials and venue</b></p> <p>As a result of the above preparatory meetings, each partner and resource person will prepare, in close coordination with the others, additional materials, presentations and references to be used for the training. The Training Handbook as a major output from the 1<sup>st</sup> Training in 2007 will be used as key training material and reference for the training.</p>	March – June 2008	
<p><b>Activity 3: The 2<sup>nd</sup> Joint Regional Training on Community-based Aquaculture for Remote Rural Areas of Southeast Asia</b></p> <p>Training for the trainers or in other word for extension staff from each member country will be in conducted in English. Field work practice and visits to communities will be organized. At least two relevant government staff from each member country (except Brunei, Singapore), whose work is related to small-scale aquaculture extension, who are active in the field of rural development and poverty alleviation, and who are dealing with farmers located in remote areas, will be invited to the training. These key people should be able to train additional extension staff in their own country upon completion of their own training. Women will be encouraged to participate.</p>	July/August 2008	

##### 4.2 Expected Outcomes

Capacity of key extension staff, who considered as service providers/trainers that can pass on the skills to extension people at the national level, from the Member Countries on Sustainable Freshwater Aquaculture for Rural Communities, is built through exchange of experience and through the mobilization of regional capacity.

## OVERVIEW OF JAPANESE TRUST FUND PROGRAMS FOR 2008

### 1. Background

The Fisheries Agency of Japan (FAJ) has been providing a series of Trust Funds to SEAFDEC since 1998. Currently, there are two major categories as JTF, namely, TF2 and TF41. FAJ modified TF2 in the course of requesting the budget for the Japanese fiscal year 20072. As a result, TF2 will be broadened with more focus on regional fishery management and international fisheries issues while keeping the basic framework of the past TF2.

The budget for TF4 will end in the Japanese fiscal year 2008, and therefore FAJ is planning to submit a budget request of a new TF category (so-to-call TF5) for 20093 to the Ministry of Finance of Japan based on the request of SEAFDEC. The budget requesting process for the Japanese fiscal year 2009 will start in April 2008.

Taking into account the above situation, the SEAFDEC Program Planning Meeting for JTF for 2008 and Onward was organized by SEAFDEC Secretariat with funding support by the JTF from 28 to 29 June 2007 in Bangkok, Thailand. The Meeting was held as part of the implementation of the programs/projects supported by JTF and with the objectives of deepening the understanding of SEAFDEC Member Countries and SEAFDEC Departments on the JTF policy and supported activities as well as explaining and discussing the objectives and components of the projects under the new TF2 and TF5.

In the meeting, SEAFDEC Member Countries, SEAFDEC Secretariat and Departments submitted and explained their proposals for new TF2 and TF5. Based on the result of the meeting, SEAFDEC has tried to accommodate the proposals for new TF2 in the annual plan for 2008, in accordance with the objectives of new TF2 and JTF criteria. Meanwhile, the proposals for TF5 are being considered to build up the components of TF5 by Lead Departments.

In this regard, Japanese Trust Fund Manager would make a presentation on the overview of the annual plan for 2008 focusing on how the proposals of new TF2 have been reflected in the annual plan for 2008 as a result of follow-up activities to the JTF planning meeting.

### 2. Summary of the proposals for new TF2 and TF5

The SEAFDEC Member Countries, SEAFDEC Secretariat and Departments submitted 29 proposals for new TF2 and 34 proposals for TF5. The summary and the current status are as follows.

**Summary of the Proposals for New TF2**

Category	Proposals	Proponent	Status
1. Research and stock assessment	11		
- Tuna	3	Philippines, TD	SEAFDEC has tried to accommodate the proposals for new TF2 in the annual plan for 2008,
- Shared stock	3	Philippines, Vietnam, MFRDMD	
- Co-management	2	Thailand, TD	

<sup>1</sup> TF3 is still implemented but its budget was terminated in the Japanese fiscal year 2005.

<sup>2</sup> Actual activities using JTF 2007 will be implemented in the SEAFDEC fiscal year 2008 as one year time lag exists.

<sup>3</sup> Equally, actual activities using JTF 2009 will be implemented in the SEAFDEC fiscal year 2010.

- Others	3	Indonesia, Vietnam, TD	in accordance with the objectives of new TF2 and JTF criteria.
2. Exploration of new resources and fishing ground	6	Indonesia, The Philippines, Thailand, TD, MFRDMD	
3. Effective utilization of under-utilized resources	1	TD	
4. Improvement of post-harvest practice	7	Malaysia, Thailand, Vietnam	
5. International fisheries issues	4	Malaysia, Secretariat, TD	
	29		

#### Summary of the proposals for TF5

Category	Proposals	Proponent	Status
1. Sustainable aquaculture practice	11	Malaysia, Philippines, Vietnam, Secretariat, MFRD, AQD	The proposals for TF5 are being considered to build up the components of TF5 by Lead Departments.  The revised proposals will be compiled by first-quarter of next year.
2. Environmental-friendly resource enhancement	3	Philippines, AQD, MFRDMD	
3. Preservation of critical fishing ground	8	Philippines, TD, AQD, MFRDMD	
4. Food safety of aquaculture products	8	Malaysia, Philippines, Vietnam, MFRD, AQD	
5. Others	4	Malaysia, TD	
	34		

### 3. Framework of the annual plan of JTF for 2008

#### (1) New TF2

In 2008, 11 projects will be submitted as the proposed annual plan of TF2 for 2008 to FAJ for consideration. These 11 projects include 3 brand-new projects, while several proposals have been incorporated into the existing projects as new components or activities. The total budget for these projects is expected to be US\$542,000 with an increase of US\$137,000 compared with the scale of this year. Its framework and the situation of reflecting the proposals are as follows:

#### Framework of annual plan of new TF2 for 2008

Components/Projects	Lead Department	New project or new activities based on the proposals	Related proponents
<b>I. Information collection for sustainable pelagic fisheries in the South China Sea and Andaman Sea</b>			
1. Tagging program for economical important species in the South China Sea and Andaman Sea	MFRDMD	MFRDMD will conduct information collection about FADs and sardines in the South China Sea.	The Philippines
2. Development of regional database for fisheries management	TD	New project starting from 2008	TD
<b>II. Development of demersal fishery resources living in untrawlable fishing ground in the South Asia Waters</b>			
1. Information collection for economical important species: as surimi materials	TD		

2. Deep sea fisheries resources exploration in the Southeast Asia	TD+ MFRDMD	TD will work closely with the requested countries to find out the possible collaborative research works.	Indonesia, The Philippines, Thailand MFRDMD
3. Sustainable utilization of potential fisheries resources & reduction of post-harvest losses	TD		
<b>III. Fishery management of shared stocks in Southeast Asia Waters</b>			
1. Information collection of highly migratory species in the Southeast Asia Waters	TD	TD will conduct information collection of Tuna fishery in SEA Waters. New project starting from 2008.	TD
2. Promotion of Rights-based fisheries and co-management towards institutional building and participatory mechanism for coastal fisheries management	TD	New project starting from 2008	Thailand, TD
<b>IV. Research for the safety of fisheries products in the Southeast Asia</b>			
1. Chemical and drug residue in fish and fish products and their environment	MFRD	The proposals on Biotoxin (Thailand), Traceability (Malaysia), Food safety (Vietnam) were deferred until funding is available with possibility to be candidates for "Food Safety" components under TF5.	Malaysia, Thailand, Vietnam
2. Quality assurance systems for small and medium-sized fish processing establishments in ASEAN member countries	MFRD		
<b>V. Information collection about international fisheries issues</b>			
1. Assistance of Capacity Building in the Region to address International Fisheries Related Issues	Secretariat		
2. Cetacean research in Southeast Asia Waters	TD	New project starting from 2008	TD



**(2) TF3**

In 2008, 4 projects will be conducted. The total budget for these projects is expected be US\$130,000.

**Framework of annual plan of F3 for 2008**

Components/Projects	Lead Department
<b>I. Environmental related tasks in Southeast Asia region</b>	
1. Management of fisheries and utilization of sharks and research on sea cucumbers in Southeast Asia	Secretariat
2. Responsible fisheries technologies and practices	TD
<b>III. Publication to enhance awareness of SEAFDEC activities on sustainable fisheries</b>	
1. Publication of the special publication, "Fish for the people"	Secretariat
<b>III. Towards better utilization and harmonized information for fisheries management in Southeast Asia</b>	
1. Towards better utilization and harmonized information for fisheries management in Southeast Asia	Secretariat

**(3) TF4**

In 2008, 7 projects will be conducted. The total budget for these projects is expected be US\$540,000.

**Framework of annual plan of TF4 for 2008**

Components/Projects	Lead Department
<b>I. Resources conservation program: Research and development (R&amp;D) of stock enhancement for species under international concerns</b>	
1. Stock enhancement for threatened species of international concerns	AQD
2. Research for stock enhancement of sea turtle	MFRDMD, TD
<b>II. Environment friendly aquaculture &amp; fish disease program: Development of fish disease surveillance system &amp; promotion of sustainable aquaculture</b>	
1. Development of fish disease surveillance system	AQD
2. Promotion of sustainable aquaculture for rural communities	Secretariat
3. Development of technologies and human capacity building for sustainable aquaculture	AQD
<b>III. Fishing community development program: Capacity improvement of fisheries community for fisheries management and alleviation of poverty</b>	
1. Capacity building of human resources for participation in integrated coastal resources management	TD
2. Follow-up activities and improvement of the Set-net fishing technologies transfer for sustainable coastal fisheries management	TD

## REVIEW OF SEAFDEC PIPELINE PROJECTS

### INTRODUCTION

In response to the policy change of annual contribution from the Member Countries to SEAFDEC, the Center's programs of activity starting from the year 2007 and onwards will be funded from irregular funding sources. The paper attempts to review progress and efforts by the Secretariat and the Departments in developing project proposals for funding and/or partnership arrangement.

### SEAFDEC PIPELINE PROJECTS

Based on on-going preparation and negotiation with donor/partner agencies, the following are current status of the pipeline projects:

#### Islamic Development Bank (IDB)

- Community Fisheries – Strengthening Organization of Communities for Sustainable Livelihoods in Coastal Areas (2007-2009) (Appendix 1)

#### ASEAN Foundation (Appendix 2)

- Human Resource Development (HRD) on Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region (2008-2010)
- Awareness Building on Sustainable Development of Fisheries in the ASEAN Region (2008)

#### Wetland Alliance Program (WAP)

- Transboundary Collaborative Arrangement Supporting Aquatic Resources and Habitat Management for Sustainable Fisheries (2008-2009) (Appendix 3)

### SUGGESTED ACTIONS BY THE COMMITTEE

The Committee is invited to consider the progress of pipeline projects and where appropriate provide comments for further development and finalization of the projects with respective donors or partner agencies.

## STATUS AND PLAN OF PROGRAMS SUPPORTED BY THE ISLAMIC DEVELOPMENT BANK

### Project Concept Note

**Project Title:** Community Fisheries – Strengthening Organization of Communities for Sustainable Livelihoods in Coastal Areas

**Prospect Funding Agency:** Islamic Development Bank (IDB)

**Project Duration:** 3 years

#### **Background and Rationale:**

The coastal areas in Southeast Asia provide environmental services and means of livelihood to the coastal dwellers. Due to degradation of coastal resources and conflicts over the multiple resource use, livelihoods of coastal communities have been further threatened. This calls for a need to strengthen community organization and capacity building to support better development and management of coastal resources to ensure sustainable livelihoods of coastal communities.

#### **Goal:**

Sustainable development and exploitation of coastal resources and amelioration of the socioeconomic condition of the Muslim fishers and farmers and other stakeholders by empowering them through strengthen community organization to become efficient resource managers and prudent resource users through enhancement of their knowledge and skills in fisheries, aquaculture and aquatic resources management.

#### **Target Beneficiaries and Countries:**

Target beneficiaries are selected Muslim fisheries communities, village and local government extension workers, development workers, and small-scale fishers and fish farmers in Brunei Darussalam, Indonesia and Malaysia with involvement of representatives from the Philippines and Thailand who are working in support of Muslim communities in their respective countries

#### **Project Assumption:**

Policies and institutions should have firm foundation in the community and local levels of fisheries governance to ensure effective co-management arrangements between the local government and the Muslim community and effective transfer and adoption of responsible fisheries and aquaculture technologies and practices.

#### **Project Strategy:**

Building capacities of target beneficiaries on participatory, inter-disciplinary and community-based strategies in community organization and capacity building as well as the transfer and adoption of knowledge-based coastal resources management and responsible fisheries and aquaculture technologies and practices

#### **Project Components:**

1. Community organization and institutional capacity building of fisheries communities including social preparation and empowerment of communities and co-management in coastal fisheries and aquaculture
2. Capacity building and training for extension workers and fisheries communities in
  - a. Coastal resource management, and
  - b. Sustainable fisheries and aquaculture practices
    - Responsible fishing techniques including community-operated fishing gear i.e. set nets
    - Fisheries Enhancement Devices (FEDs)

- Mariculture of selected species (sea bass, grouper, milkfish etc)
- Seaweeds and mollusks farming
- Community fisheries post-harvest and processing

## STATUS AND PLAN OF PROGRAMS SUPPORTED BY THE ASEAN FOUNDATION

### Project Concept Note

#### I. Project Title: Human Resource Development (HRD) on Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region

**Prospect Funding Agency:** ASEAN Foundation

**Project Duration:** 24 months (February 2007 to January 2009)

#### Project Objectives:

To enhance human capacity of fishers of selected rural fishery communities as well as relevant fisheries government officials and those working at the local level in support of fishery communities in order to alleviate the identified poverty status through fisheries intervention covering the areas of co-management, responsible fishing practices, backyard fishery post-harvest and processing, rural aquaculture and inland fisheries development. A special focus will also be given to the rural areas and fishery communities in ASEAN region.

- 1) Support of requirements on poverty alleviation by fisheries intervention through mobilizing of regional experiences and information exchange in ASEAN region.
- 2) Identification of prioritized HRD programs on thematic areas based on local needs, and partnership support from national and regional level.
- 3) Implementation of the appropriate HRD activities to mitigate the rural poor by the fisheries intervention.

#### Project Description:

The project will comprise the following activities:

##### 1. First Regional Technical Consultation on Fisheries Human Resources Development (HRD) for Poverty Alleviation

The consultation will be conducted to 1) develop the regional policy on the role of fisheries for the poverty alleviation reflecting the analysis on the respective national problems; 2) identify the technical issues, which will be critical for the poverty alleviation with envisaging practical problems in the specific areas; 3) clarify the role of small and medium-scale enterprises (SMEs) with respect to the poverty alleviation of the rural poor, and 4) identify the seven project sites for the implementation of appropriate on-site HRD activities. In order to identify the seven project sites, one policy maker and one technical staff who are responsible for the extension work of the central government as well as the relevant NGOs, academic institutions of the ASEAN Member Countries will be invited to the three days RTC.

##### 2. Human Resources Development (HRD) Activities on Thematic Areas

Based on the outcomes of the RTC above, HRD activities in respective technical areas will be conducted in five different sites mobilizing technical experiences and facilities of SEAFDEC Departments. The five technical areas will be proposed as follows:

- 1) Local/indigenous institution and co-management: *Secretariat*
- 2) Responsible fishing technologies: *Training Department*

- 3) Backyard fishery post-harvest technology: *Marine Fisheries Research Department*
- 4) Rural aquaculture: *Aquaculture Department*
- 5) Inland fisheries development: *Marine Fishery Resources Development and Management Department*

A 10-day individual HRD activity will be conducted at respective Departments. The government official, who is responsible for the extension work of ASEAN Member Countries and representative from the fishery community, will be invited for the HRD activities. The envisaged activities will be to further identify the specific requirements of the HRD issues in each respective site in collaborative manner (involvement of SEAFDEC, central and provincial government of the respective sites).

Based on the outcomes of discussion, the staff of the Secretariat in collaboration with ASEAN Member Countries will prepare the appropriate HRD materials to be used in the on-site HRD activities.

### **3. On-site Human Resources Development (HRD) Activities**

HRD Activities at five specific sites as identified at the 1<sup>st</sup> RTC will be conducted by mobilizing regional expertise both SEAFDEC side and also from the Member Countries. This will enable the Member Countries to be involved in the implementation of on-site activities. The on-site HRD activities for marine coastal fisheries will be proposed at three sites, to include two sites for Tsunami affected areas (Aceh, Indonesia and Andaman coast of Thailand, which are the most affected areas from tsunami in the ASEAN region), while two sites will be for inland fisheries . The following are the required steps to implement the project activities.

- 1) Identification of specific local indigenous institution for the sites.
- 2) Identification of the types and manners of HRD activities.
- 3) Identification of the appropriate numbers of beneficiaries.
- 4) Collaboration mechanism with the host governments.
- 5) Finalization of the Terms of Reference of the staff involved both for national and regional technical staff.
- 6) Coordination mechanism among the five thematic HRD activities.

### **4. Second Regional Technical Consultation on Fisheries Human Resources Development (HRD) for Poverty Alleviation**

The Consultation will be organized to evaluate the project activities, identify the follow up activities to be conducted with respect to the poverty alleviation by fisheries intervention. Considering the existing regional policy frameworks and priority actions in fisheries and HRD particularly the “Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region” adopted in 2001 and the “Strategy for Human Resource Development in Fisheries in the ASEAN Region”, adopted in 2004, the Consultation is expected to strengthen these policy directions on fisheries for poverty alleviation. One policy maker and one technical staff who are responsible for the extension work of the central government as well as the relevant NGOs, academic institutions of the ASEAN Member Countries will be invited to the three days RTC. The proceedings of RTC will be used as basis for the project final report.

#### **Expected Outputs:**

After the whole process of project activities, it is expected that regional policy for poverty alleviation will be developed, including enhancement of fisheries officials, who responsible for extension work particularly at local community and fishers capacity as well as strengthening of national and local government cooperation. It is also envisaged that the effective

implementation of the HRD activities on thematic issues at the local level will be the key to develop the cooperation mechanism within the ASEAN Member Countries.

### **Progress and Achievements:**

In response to the 2<sup>nd</sup> remarks made by the ASEAN Foundation, the Secretariat revised the project proposal accommodating their comments and clarified interest of the ASEAN-SEAFDEC Member Countries as well as operational plan in general. The proposal was re-submitted again to the Embassy of Japan in Thailand and Indonesia on 6<sup>th</sup> November 2007. It is expected after submission of accommodated remarks project proposal to ASEAN Foundation, if there is no more comments, within two months the project can be launched.

## **II. Project Title: Awareness Building on Sustainable Development of Fisheries in the ASEAN Region (2008)**

**Project Duration:** 12 months

### **Background & Rationale**

In ASEAN region, it is recognized that fisheries resources are crucially important in terms of socio-economic, food security and livelihoods. Fish as food provides cheap source of animal protein to the poorer, trade of fish and fish products creates employment and income generation as well as a foreign exchange at international market. There is no doubt that how significant of fisheries sector contribute to the people in ASEAN. However, overfishing and environmental degradation have caused fisheries resources depleting, of which ASEAN and SEAFDEC are seriously taken this situation into account.

Since 1967, SEAFDEC as an inter-governmental organization specialized in fisheries providing technical supports to the Member Countries of ASEAN in broad fields with the aim to ensure that utilization of fisheries resources would be sustained, responsible, well managed and not reach to over-exploitation. A technical cooperation between ASEAN and SEAFDEC towards sustainable fisheries development has been implemented under the regional framework (ASEAN-SEAFDEC Fisheries Consultative Group Mechanism). Promotion of sustainable fisheries development through this channel is well accredited within ASEAN.

The ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People” held in Bangkok from 19 to 24 November 2001, was organized with the financial support by the Japan-ASEAN Solidarity Fund in the ASEAN Foundation. 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.

In addition, various programs/activities were executed, much of which addresses on human resource development particularly developing countries and remote areas with the aim to reduce economic development gap within the ASEAN and alleviate poverty by contribution of fisheries sector. The programs include South-South Cooperation in the ASEAN Region and Capacity Building on the Improvement of Fishery Statistical System in the ASEAN Region, and Human Resource Development (HRD) for Sustainable Development of Fisheries in Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) Region. To address the issue on poverty alleviation, there are two new projects will be launched in 2008, which are HRD on Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region and Promotion of One Village, One Fisheries Product (FOVOP) System to Improve the Livelihood for Fisheries Communities in ASEAN Region.

To raise profile of ASEAN in promoting sustainable fisheries development and commemorate its 40<sup>th</sup> year's collaboration between ASEAN and SEAFDEC, public awareness on the above efforts should be shaped up. Therefore, printed publication, posters, and video documentary in relation to sustainable fisheries development in ASEAN with the aim to combat poverty should be produced.

**Objectives:**

- 1) To raise profile of ASEAN in combating poverty through promotion of sustainable fisheries development;
- 2) To provide comprehensive view on regional fisheries activities on sustainable fisheries development;
- 3) To publicize collaborative effort between ASEAN and SEAFDEC in promotion of sustainable fisheries development for poverty alleviation.

**Project Description**

**1. Production of Posters and Publications**

Posters and handicap publications will be produced with the aim to address an important of sustainable fisheries development in combating poverty within the ASEAN and regional collaborative efforts between ASEAN and SEAFDEC through the financial support of Japan-ASEAN Solidarity Fund. Past achievements from the implementation of aforementioned key collaborative programs/activities will be highlighted, especially activities enhancing human capacity in fisheries sector.

**2. Production of Video Documentary**

To picture of overall achievements and reflect importance of fisheries development to alleviate poverty in ASEAN region, motion pictures in four selected countries will be filmed; priority will be given to CLMV and BIMP-EAGA sub-regions. Leaders of selected countries, ASEAN, ASEAN Foundation and SEAFDEC will be interviewed to express their visions in future promotion of sustainable fisheries development as well as suggestion towards improvement of fisheries in ASEAN region.

**Expected Output:**

- 1) Printed posters and publications related to sustainable fisheries development to alleviate poverty in ASEAN region;
- 2) Video documentary related to sustainable fisheries development to alleviate poverty in ASEAN region; and

It is expected that all posters, publications, and video documentary will raise profiles of ASEAN and regional collaborative efforts between ASEAN and SEAFDEC on promotion of sustainable fisheries development in combating poverty.



## **STATUS AND PLAN OF COLLABORATIVE PROGRAM WITH WETLAND ALLIANCE PROGRAM**

### **Project Concept Note**

**Program Title:** Transboundary Collaborative Arrangement Supporting Aquatic Resources and Habitat Management for Sustainable Fisheries

**Prospect Funding Agency:** Wetland Alliance Program (WAP)

**Lead Department:** Training Department

**Lead Country:** Cambodia, Vietnam

**Total Duration:** 24 months (2008-2009)

### **1. INTRODUCTION**

The Wetland Alliance is a regional program addressing local capacity building for sustainable wetlands management. It is a combined strengths of four partners- the Asian Institute of Technology (AIT), Coastal Resources Institute of Prince Songkhla University (CORIN), WorldFish Center, and World Wide Fund for Nature (WWF) that work towards a common approach to building the skills that staff at local levels need for sustainable aquatic resources management. With the prospect funding from the Swedish International Development Cooperation Agency (SIDA), the program has been developed based on complementary strengths of the WAP partners. A logical framework is formulated with the goal of improving sustainability of wetlands, livelihoods and food security for the poor, complementing aquatic resources and habitat management at the local level particularly in Kampot, Cambodia and Kien Gaing, Vietnam, the component on transboundary collaborative arrangement was identified as part of WAP. Considering existing collaborative framework among Cambodia, Vietnam and SEAFDEC, therefore, SEAFDEC Training Department was invited to assist the development process in transboundary collaborative arrangement.

### **2. PROGRAM**

#### **2.1 Objectives**

Strengthen the capacity of local change agents to support sustainable wetlands management for the benefit of the poor.

To achieve the main objective, the following objectives will be focused:

- 1) To building knowledge and capacity of local change agents in each local area, in term of technical and management skill;
- 2) To support and be consultant on transboundary collaborative arrangement between two target sites;
- 3) To establish role and responsibilities and system for information exchange of agencies of two target sites;
- 4) To strengthen systems and mechanisms of administration and management;
- 5) To establish common and management plan and measures as well as a joint Monitoring, Control and Surveillance (MCS) framework.

#### **2.2 Program description**

SEAFDEC together with WAP partners have been seeking a cooperation in implementing the process of establishing the necessary mechanism and strengthening the capacity building for human resources development of local agencies and communities in the two neighboring

province to, ultimately, help people to improve the livelihoods in Cambodia and Vietnam. In this connection, the collaboration of SEAFDEC-WAP for year 2008-2009 is planned, the specific local human capacity building that are needed to provide local support to the establishment of the coastal resources management mechanism should be identified in order to sustain the uses of marine resources in this transboundary area.

### 3. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2008

<b>Program/Project /Activities</b>	<b>J</b>	<b>F</b>	<b>M</b>	<b>A</b>	<b>M</b>	<b>J</b>	<b>J</b>	<b>A</b>	<b>S</b>	<b>O</b>	<b>N</b>	<b>D</b>
1. The Inception meeting on Transboundary Collaborative Arrangement between two countries												
2. Collaborative capacity building for common management planning and implementation												
3. Formulation a joint monitoring control and surveillance (MCS) framework												
4. Develop and disseminate bi-lingual publication for common approaches for aquatic resources and habitat management for sustainable fisheries												

### 4. EXPECTED OUTCOMES

- 1) Transboundary collaborative arrangement and mechanism between two target sites are established;
- 2) Technical skills and competencies of local change agents developed;
- 3) Improved communication that supports participatory development and fosters information exchange and dialogue;
- 4) Capacities and system developed for accessing and disseminating knowledge on wetlands and aquatic resources relevant to local needs;
- 5) Networks promoting trust and cooperation between partners established;
- 6) Strengthened systems and mechanisms of administration and management that are conducive to and support relevant forms of participatory development at the local level;
- 7) Improved responsiveness to institutional and environmental changes;
- 8) An alliance of regional institutions sharing and promoting a common framework for local level capacity building in dialogue and cooperation with other regional organizations and institutions.



**DRAFT**

**PROPOSAL ON THE ESTABLISHMENT OF SEAFDEC REGIONAL SCIENTIFIC  
ADVISORY COMMITTEE ON FISHERIES MANAGEMENT IN SOUTHEAST ASIA  
(RSAC)**

**I. Background and Rationale**

1. In response to the current declining state of world fishery resources due to unsustainable utilization, there has been concern expressed by international society for the need to improve current fisheries management framework and practices. Echoing the international concern, countries in Southeast Asia have over the years discussed ways to strengthen the fisheries management in the region through both individual country's effort and regional cooperation.

2. Over the last few years, concern and need for improving fisheries management in the region particularly addressing issues related to fishing capacity and Illegal, Unreported and Unregulated (IUU) fishing have been discussed<sup>1</sup>. Countries in the region also discussed the usefulness of the regional mechanism to regulate fishing capacity at sub-regional level (Gulf of Thailand, Malacca Strait, Andaman Sea, South China Sea and Sulu or Celebes Sea)<sup>2</sup>. The countries recommended investigating the establishment of the Regional Scientific Advisory Committee for Fisheries Management, which should be established to enhance information collection for fisheries management<sup>3</sup>. The countries requested SEAFDEC Secretariat to formulate a proposal, clarifying Terms of Reference, linkages with existing regional collaborative mechanism, and financial implication and arrangement<sup>4,5</sup>.

3. The countries met at the 39<sup>th</sup> Meeting of SEAFDEC Council held in Siem Reap, Cambodia from 3 to 7 April 2007, considered and supported in principle the proposal for Regional Scientific Advisory Committee for Fisheries Management in Southeast Asia. This initiative is envisaged to signal the seriousness and commitment of the region in improving fisheries management and should be made to move towards long-term establishment of a regional fisheries management mechanism. Support by the countries was echoed at the 15<sup>th</sup> Meeting of ASEAN Sectoral Working Group on Fisheries held in Singapore from 16 to 18 May 2007.

4. In line with the above views, the First ASEAN-SEAFDEC Regional Expert Consultation on Future Roles of SEAFDEC in Fisheries Management in Southeast Asia was organized in Bangkok, Thailand from 26 to 28 June 2007. The Consultation confirmed the title of RSAC and emphasized on its advisory role as well as clarified and discussed various issues as guided by the SEAFDEC Council. However, the Consultation could not conclude the discussion and decided to defer the discussion.

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<sup>1</sup> 29<sup>th</sup> Session of the Asia-Pacific Fisheries Commission (APFIC), Kuala Lumpur, Malaysia from 21 to 23 August 2006

<sup>2</sup> ASEAN-SEAFDEC "Regional Technical Consultation on Management of Fishing Capacity and Human Resource Development in Support of Fisheries Management in Southeast Asia", Phuket, Thailand from 19 to 22 September 2006

<sup>3</sup> ASEAN-SEAFDEC "Expert Meeting on Fisheries Statistics, Information and Indicators", Bangkok, Thailand from 27 to 29 November 2006

<sup>4</sup> 29<sup>th</sup> Meeting of the SEAFDEC Program Committee, Bangkok, Thailand from 4 to 6 December 2006

<sup>5</sup> ASEAN-SEAFDEC "Regional Technical Consultation on International Fisheries Related Issues (2007)", Chiang Mai, Thailand 5-7 February 2007

5. As a follow-up to the first Consultation, the Second ASEAN-SEAFDEC Regional Expert Consultation on Future Roles of SEAFDEC in Fisheries Management in Southeast Asia was held in Bangkok, Thailand from 23 to 25 October 2007. The Consultation supported the need to establish an RSAC and concluded a proposal for its establishment, outlining areas of cooperation as well as roles and function, and financial arrangement for the RSAC. The Consultation agreed to submit the proposal to SEAFDEC Council for its consideration and decision.

## **II. Objectives of RSAC**

6. RSAC is established to assist the SEAFDEC Member Countries in achieving sustainable utilization of fisheries resources through improved fisheries management for food security, sustainable livelihoods of the people, and economic development and integration in Southeast Asia.

## **III. Guiding Principles of RSAC**

7. Guiding principles of RSAC are generally based on the 1995 FAO Code of Conduct for Responsible Fisheries. Although, nature of the Code is voluntary but it was formulated in a manner consistent with the relevant provisions and rules of international laws. These are, inter alia, the 1982 United Nations Convention on the Law of the Sea, the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995 (UN Fish Stock Agreement 1995), the 1992 Declaration of Cancún, the 1992 Rio Declaration on Environment and Development, in particular Chapter 17 of Agenda 21 and the Convention on Biological Diversity, 1994.

8. In addition to the above international instruments, guiding principles of RSAC also recognize existing regional policy frameworks and collaborative arrangement for fisheries in Southeast Asia. These are the 1995 Agreement on Sustainable Development of the Mekong River Basin (Mekong River Commission), the 2001 Resolution & Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region (RES & POA), Regional Guidelines for Responsible Fisheries (RCCRF), the Strategic Plan of Action (SPA) for the ASEAN Cooperation in Fisheries (2005-2010), and the 2007 Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region.

9. Key guiding principles of RSAC include:

- The right to fish and the obligation to do so in a responsible manner so as to ensure effective conservation and management of the living aquatic resources;
- Rationale and responsible utilization, and maintenance of resources in sufficient quantities for present and future generations in the context of food security, poverty alleviation and sustainable development;
- Management decisions for fisheries should be transparent and based on the best scientific evidence available, also taking into account traditional knowledge of the resources and their habitat, as well as relevant environmental, economic and social factors;
- Protection and rehabilitation of critical fisheries habitats and integration of fisheries into multiple aquatic resources use planning, development and management;
- Cooperation among the Member Countries within their respective competences and in accordance with international law, at sub-regional, regional and global levels through fisheries management organizations, other international agreements or other arrangements to promote conservation and management, ensure responsible fishing and ensure effective conservation and protection of living aquatic resources, taking into account the need for compatible measures in areas within and beyond national jurisdiction; and
- Involvement of and consultation with stakeholders, through awareness and capacity building, in the policy formulation and implementation process, and the conservation and

management of the fishery resources on which they depend.

#### **IV. Roles of RSAC**

10. The role of RSAC is to provide technical/scientific advice to the SEAFDEC Council for the improvement of fisheries management in Southeast Asia.

#### **V. Scope of RSAC's Advice**

11. The advice provided by RSAC will cover management of fisheries generally conducted in marine waters within the EEZs and inland waters in Southeast Asia including fisheries with particular attention to transboundary fish stocks.

#### **VI. Terms of Reference (TOR) of RSAC**

12. Terms of Reference of RSAC include:

- To review and assess the current status of the fishery resources in particular transboundary fish stocks, the status of fishing industries, and fisheries management measures and administrations in the region;
- To provide advice on priority fisheries management issues including policy considerations, coordinated fisheries management actions, and human and institutional capacity building, in order to formulate recommendations for improved fisheries management;
- To facilitate addressing the identified issues, including assessment and in-depth studies, possibly through ad-hoc technical working group(s);
- [To advise on demarcation and coordination among SEAFDEC programs related to fisheries management]\*; and
- To collaborate with international/regional organizations, programs or projects concerned with fisheries management and sustainable use of fisheries resources in formulating advice.

#### **VII. Organizational Structure of RSAC**

13. RSAC is established as a subsidiary body of the SEAFDEC Council. RSAC may, as and when required, identify and recommend the setting up of ad-hoc technical working group(s).

14. RSAC comprises one standing member representing each SEAFDEC Member Country by nomination [with a fixed tenure]\*. The Terms of Reference (TOR) of RSAC form as the guidelines for such nomination.

15. RSAC will be chaired by a representative of SEAFDEC Member Countries on an annual rotational basis.

16. RSAC may identify and invite resource persons/experts from the Member Countries, ASEAN and other international/regional organizations to participate in RSAC on an ad-hoc basis.

17. SEAFDEC Secretariat and relevant Departments serve as the RSAC secretariat.

#### **VIII. Nature of RSAC Activities and Financial Arrangement**

18. RSAC is scheduled to meet at least once a year. The timing of the meeting(s) should be set in accordance with SEAFDEC annual working cycle.

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\* There was no consensus on this specific proposal.

\* There was no consensus on this specific proposal.

19. Inter-sessional activities (i.e. meetings of technical working groups) as identified by RSAC may be conducted, subject to availability of funds.
20. There are two options for the financial arrangement for RSAC meetings (including incidental expenses incurred by RSAC):
- Option 1: Fully funded by SEAFDEC Minimum Regular Contribution; or
  - Option 2: Partially funded by SEAFDEC Minimum Regular Contribution and partly by respective countries or from extra budgetary sources<sup>6</sup>
21. The cost for attendance of the resource persons during RSAC meeting (s) or during the inter-sessional activities should be from extra budgetary sources, while the cost for the experts/representatives from international/regional organizations will be shouldered by their respective organizations.
22. The cost for the implementation of activities of the ad-hoc technical working group(s) will be funded from extra-budgetary sources<sup>7</sup>.
23. SEAFDEC Secretariat in collaboration with the Member Countries and the Departments is responsible for sourcing extra-budgetary funds for RSAC.
24. Based on RSAC's advice, the SEAFDEC Council will decide on how such advice should be considered and followed-up (by the Member Countries and/or SEAFDEC Secretariat and Departments) including imparting the advice to the ASEAN (through ASEAN Sectoral Working Group on Fisheries), the Coordination Committee of RPOA on Responsible Fishing Operations including Combating IUU Fishing, and countries outside the region operating fisheries in the region.

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<sup>6</sup> For the Option 2, the financial arrangement should be made in the same manner as the organization of other SEAFDEC annual meetings, i.e. Council Meetings, so that the meeting cost as well as participation of members from SEAFDEC Departments and Secretariat will be covered by the SEAFDEC Minimum Regular Contribution (MRC), while the participation cost (daily subsistence allowance, and cost for accommodation and traveling) of members from the Member Countries and resource persons will be shouldered by the respective countries or from extra budgetary sources.

<sup>7</sup> On matters of urgency and when extra budgetary sources is not available, funding support from participating countries of the Technical Working Group could be explored.

## CLOSING SPEECH

*By Dr. Siri Ekmaharaj, SEAFDEC Secretary-General*

Ladies and Gentlemen, Good Afternoon!

As chairman of the Program Committee Meeting, I would like to thank all of you for your hard work during the past three days. Your efforts have made the meeting successful and I am happy that we are able to achieve our objective of reviewing the progress of implementation of the projects and activities in 2007 and endorsed the programs to be implemented in 2008. We have also considered the pipeline projects and the emerging needs for preparation of future projects. We have also discussed the programs under the FCG, and our recommendations at this Meeting will be endorsed to the FCG Meeting which will be held tomorrow until Friday.

Moreover, we have also discussed the programs under the Japanese Trust Fund, and I am happy that the Trust Fund Team at the Secretariat has considered ways and means of reviewing the activities under the Trust Fund. In fact, early this year, the SEAFDEC Program Planning Meeting for the Japanese Trust Fund for 2008 and Onwards was organized in Thailand in June 2007, in order to make the MCs and departments understand better the JTF policy and activities. As a result of such Meeting, some proposals have been accommodated in the SEAFDEC regional programs to be implemented in 2008 under the new TF2 and TF3 and TF4.

We have also clarified some issues related to the proposal on the Establishment of SEAFDEC Regional Scientific Advisory Committee on Fisheries Management in Southeast Asia (RSAC) agreeing that RSAC is not part of the Program Committee and that the outcome of the discussion would be submitted to the forthcoming Meeting of the SEAFDEC Council for consideration.

As I have informed you in my Opening Speech, the outcome of the PCM will be submitted to the forthcoming meeting of the SEAFDEC Council for consideration and approval. I am again very thankful for your cooperation and support for we have streamlined the programs and have come up with a compendium of programs that address the priorities and needs of the member countries. Thank you once again and I declare the 30<sup>th</sup> Meeting of the Program Committee closed.

For those who will leave for their respective countries, I wish you safe journey back home and for the rest, I will see you at the FCG Meeting tomorrow.