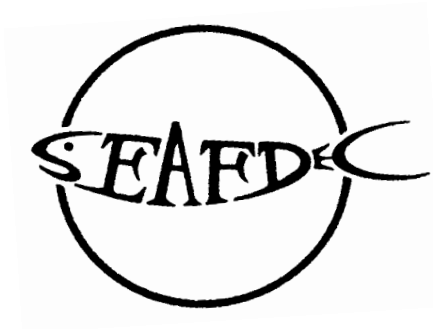


**REPORT OF
THE THIRTY-THIRD MEETING OF THE PROGRAM COMMITTEE
OF THE SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

**Bangkok, Thailand
30 November – 2 December 2010**



**THE SECRETARIAT
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**

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EXECUTIVE SUMMARY

I. INTRODUCTION

1. The Thirty-third Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Bangkok, Thailand from 30 November to 2 December 2010, and hosted by the Training Department (TD). The objective of the Meeting was to review the SEAFDEC programs implemented in 2010 and scrutinize the programs to be implemented in 2011 in order to ensure that the programs are formulated and implemented in line with the priorities and needs of the Member Countries.

II. PROGRAM MATTERS

2.1 Progress and Achievements of the Program Implementation in the Year 2010

2. The meeting took note of the achievements made in the implementation of the SEAFDEC programs for the year 2010 which can be categorized into three main categories: (i) Departmental Programs; (ii) Programs under Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism; and (iii) Other Programs. The lists of programs are as follow:

2.1.1 Departmental Programs

- 1) Center-wide Information Network (*Secretariat*);
- 2) Information and Communications Technology (*TD*);
- 3) Tailor-made Training and Study Tour (*TD*);
- 4) Integrated Mollusk Production (*AQD*);
- 5) Mud Crab and Shrimp Domestication (*AQD*);
- 6) Marine Fish (*AQD*);
- 7) Small-holder Freshwater Aquaculture (*AQD*);
- 8) Seaweed Strain Improvement (*AQD*); and
- 9) Aquatic Ecology (*AQD*).

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

- 1) Assistance for Capacity Building in the Region to Address International Trade-related Issues (*Secretariat*);
- 2) Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region (*Secretariat*);
- 3) Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea (*Secretariat*);
- 4) Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in ASEAN Region (*Secretariat, end during the first quarter of 2010*);
- 5) Human Resource Development (HRD) for Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region (*Secretariat, end during the third quarter 2010*);
- 6) ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 (*All Departments*);
- 7) Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature) (*TD*)¹;
- 8) Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses (*TD*);

- 9) Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2 (*TD*);
- 10) Deep Sea Fisheries Resources Exploration in the Southeast Asia (*TD*);
- 11) Information Collection of Highly Migratory Species in Southeast Asia Waters (*Secretariat in collaboration with TD*);
- 12) Development of Regional Database for Fishery Management (*TD*);
- 13) Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management (*TD*);
- 14) Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement (*TD*);
- 15) Chemical and Drug Residues in Fish and Fish Products in Southeast Asia: Biotoxins Monitoring in ASEAN (*MFRD*);
- 16) Traceability Systems for Aquaculture Products in the ASEAN Region (*MFRD*);
- 17) Promotion of Sustainable and Region-oriented Aquaculture (*AQD*);
- 18) Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release (*AQD*);
- 19) Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia (*AQD*);
- 20) Food Safety of Aquaculture Products in Southeast Asia (*AQD in collaboration with MFRD*);
- 21) Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea (*MFRDMD*); and
- 22) Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asia Waters (*MFRDMD in collaboration with TD*).

Four Non-Funded FCG/ASSP Programs in 2010, 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 (*MFRDMD*);
- 3) Utilization of Freshwater Fish in ASEAN Member Countries (*MFRDMD*); and
- 4) Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty (*TD*).

3. The Committee took note of the program on “**Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in the ASEAN Region**” and the program on “**Human Resource Development (HRD) for Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region**”, which had already been successfully completed. Considering that the Regional Guidelines on FOVOP had already been endorsed by higher authorities of the ASEAN and SEAFDEC, the Committee encouraged the Member Countries to continue the implementation of such initiatives at the national level.

2.1.3 Other Programs

- 1) Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program (*TD*); and
- 2) Promotion of Inland Small-scale Fisheries Management through Rights-based Fisheries and Co-management towards Institutional Building and Participatory Approaches (*TD in collaboration with Secretariat*).

2.2 Proposed Programs of Activities in the Year 2011 and Recommendations by the Program Committee Meeting

4. The Meeting endorsed the proposed programs of activities by the Secretariat and Departments for the year 2011 and provided recommendations to be incorporated to the program, as follows:

2.2.1 Departmental Programs in the Year 2011

5. All Nine Departmental Programs implemented by Secretariat, TD and AQD in 2010 are continued in 2011 with the recommendations from the Program Committee Meeting:

- 1) Center-wide Information Network (*Secretariat*);
- 2) Information and Communications Technology (*TD*);
- 3) Tailor-made Training and Study Tour (*TD*);
- 4) Integrated Mollusk Production (*AQD*);
- 5) Mud Crab and Shrimp Domestication (*AQD*);
- 6) Marine Fish (*AQD*);
- 7) Small-holder Freshwater Aquaculture (*AQD*);
- 8) Seaweed Strain Improvement (*AQD*); and
- 9) Aquatic Ecology (*AQD*).

6. With regards to the Program on “Center-wide Information Network”, considering the limited budget for the implementation of SEAFDEC Programs, the Committee suggested that the cost of implementation of the Program activities should be provided in the working documents to enable the Committee to assess and recommend possible adjustments of the specific activities corresponding to the availability of budget.

7. Considering the training courses conducted under the Program on “Tailor-made Training and Study Tour” by TD, the Committee was informed that AQD also offers similar type of training courses for requesting organizations, institutions and other partners in order to enhance the participation of SEAFDEC Member Countries in future tailor-made training programs conducted by the SEAFDEC Departments. The Committee then requested the concerned Departments to keep the Member Countries informed on the relevant activities (*i.e.* regular training courses and tailor-made training courses) by providing the countries with the schedule in advance.

8. The Committee took note that AQD’s Departmental Programs will shift from commodity-based approach to thematic approach in 2012, in accordance with the thematic areas discussed during the Regional Technical Consultation on Sustainable Aquaculture Development conducted in March 2010 as part of the preparatory works for the Conference in June 2011.

9. Regarding the Departmental Programs implemented by AQD, the Committee suggested that AQD should explore more venues and fora for the exchange of experiences and knowledge gained as well as the outcomes and achievements from such programs with the Member Countries and *vice versa*. In addition, AQD is requested to explore opportunity to undertake activities as follows;

- Extending the conduct of research on the replacement of fish meal with plant-based raw materials (phyto-protein) and such outcomes of the research activities should be shared with the Member Countries;
- Breeding of the catfish, *Clarias batrachus* requested by Myanmar
- On “**Seaweed Strain Improvement**”, it was requested by Indonesia to continue disseminating the scientific information on seaweed production and to consider the conduct of the workshop or the training course on the topic.

2.2.2 Programs under the FCG/ASSP Mechanism in the Year 2011

10. The endorsed programs under this category consisted of twenty five programs; twenty of these are continued programs from 2010 while another five programs are proposed as new programs in the Year 2011. One of the five new programs entitled “Utilization of Freshwater Fish in ASEAN Member Countries” is transferred from the “Non-funded program” in which the original title was modified. In 2011, the remaining three programs are under the “Non-funded program. The endorsed programs and recommendations by the meetings on each specific program are as follows:

Programs in the year 2011 (Continued from 2010)

- 1) Assistance for Capacity Building in the Region to Address International Trade-related Issues (*Secretariat*);
- 2) Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region (*Secretariat*);
- 3) Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea (*Secretariat*);
- 4) ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 (*All Departments*);
- 5) Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature) (*TD*)¹;
- 6) Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses (*TD*);
- 7) Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2 (*TD*);
- 8) Deep Sea Fisheries Resources Exploration in the Southeast Asia (*TD*);
- 9) Information Collection of Highly Migratory Species in Southeast Asia Waters (*Secretariat in collaboration with TD*);
- 10) Development of Regional Database for Fishery Management (*TD*);
- 11) Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management (*TD*);
- 12) Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement (*TD*);
- 13) Chemical and Drug Residues in Fish and Fish Products in Southeast Asia: Biotoxins Monitoring in ASEAN (*MFRD*);
- 14) Traceability Systems for Aquaculture Products in the ASEAN Region (*MFRD*);
- 15) Promotion of Sustainable and Region-oriented Aquaculture (*AQD*);
- 16) Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release (*AQD*);
- 17) Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia (*AQD*);
- 18) Food Safety of Aquaculture Products in Southeast Asia (*AQD in collaboration with MFRD*);
- 19) Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea (*MFRDMD*); and
- 20) Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asia Waters (*MFRDMD in collaboration with TD*).

New Programs from 2011

- 1) Improvement of Information Gathering System for IUU Fishing Related Countermeasures in the Southeast Asia (*TD*);
- 2) Promotion on Fishing License, Boats Registration, and Port State Measures (*TD in collaboration with MFRDMD*);
- 3) Human Resource Development for Sustainable Fisheries (*TD*);
- 4) Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing Related Countermeasures (*Secretariat*); and
- 5) Utilization of Freshwater Fish for Value-Added Products (*MFRD*).

Non-Funded Programs

- 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 (*MFRDMD*); and
- 3) Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty (*TD*).

Programs in the year 2011 (Continued from 2010)

11. For the Program on “**Assistance for Capacity Building in the Region to Address International Trade-related Issues**”, SEAFDEC was requested to include Fisheries Subsidies in the program also to provide the platform for Member Countries to discuss their views and comments (*e.g.* on Special and Differential Treatment, definition of small-scale fisheries, exemption for poverty alleviation, safety at sea, and food security) and that the resulting common position would be submitted to the forthcoming negotiation round of the WTO.

12. In this connection, SEAFDEC was requested to include in the discussion, quality and safety issues in international trade-related issues as well as sustainability and conservation of sharks. In addition, SEAFDEC was also requested to develop practical guide for the identification of shark species in the Southeast Asian waters as well as the methodologies for identifying shark species through the dried shark fins.

13. With regard to the Program on “**Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region**”, the Committee noted that SEAFDEC has developed the new Framework for Fishery Statistics of Southeast Asia which would serve as basis for the compilation of the SEAFDEC Fishery Statistical Bulletin for Southeast Asia from 2008 and onwards. In addition, in order to reduce the burden of the Member Countries in submitting fishery statistics and information to SEAFDEC and FAO for the compilation at regional and global levels, the reporting system has also been streamlined through the use of harmonized questionnaires and streamlined submission processes and mechanism as agreed among the Member Countries, SEAFDEC and FAO.

14. With regard to the SEASOFIA, the APFIC looked forward to cooperate with SEAFDEC in the harmonization of the SEASOFIA with the APFIC and FAO publications. The Committee however, noted that since the production of SEASOFIA requires significant expertise and resources, SEAFDEC could come up with a preliminary version of the SEASOFIA first, and would explore the possibility of seeking assistance from the Member Countries on the appropriate direction to proceed with the initiative in the future

15. For the Program on “**Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea**”, the representative from FAO/RAP informed the Meeting on the possible funding support for the implementation of the activities, such as the Global Environmental Facility (GEF) of which Lao PDR and Cambodia have been identified as among the eligible countries to develop and submit the necessary proposal for

funding support. In addition, the Later Stage Support Fund (LSSF) is also another source of funding for the activities, however, this would require co-financial support from the concerned countries. He then expressed his willingness to help the SEAFDEC Member Countries in accessing to such sources of funds. He also informed the Committee that APFIC is planning to organize a Regional Consultation Workshop on Climate Change in May 2011, and invited SEAFDEC to participate and provide inputs on the actions that could be undertaken at the regional level.

16. With regards to the “**ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020**”, the Committee took note of the discussions made during the 18th Meeting of the ASEAN Sectoral Working Group on Fisheries (ASWGFi) on the drafting of the Resolution and Plan of Action to be adopted by the ASEAN-SEAFDEC Ministers responsible for fisheries during the Ministerial Session of the Conference which should be undertaken by the ASEAN Member Countries. To facilitate the process, SEAFDEC would provide ASEAN-SEC and member countries the outputs from the Regional Technical Consultations and Sub-regional Public/Private Sector Dialogues as well as the analysis of the progress and achievements of implementation by the Member Countries of the 2001 Resolution and Plan of Action.

17. For the program on “**Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)**”, the Committee suggested that TD should include the preparation of the regional guidelines on fish by-catch management and discards reduction taking into consideration the international guidelines developed by FAO during 6-10 December 2010 in Rome, Italy.

18. Under the Program on “**Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2**”, the Committee suggested that SEAFDEC should consider planning the activities that could maximize the utilization of the M.V. SEAFDEC 2. In this connection, the Committee noted that Member for Brunei Darussalam proposed to use the M.V. SEAFDEC 2 in mid of 2011.

19. Regarding the program on “**Deep Sea Fisheries Resources Exploration in Southeast Asia**”, the Committee commended that TD should also include activities aimed at estimating the volume of the resources in order to investigate the feasibility of commercial investments in deep sea fishing. In addition, appropriate fishing gears/vessels (or modification of existing gears/vessels) should also be investigated to exploit these resources.

20. With regards to the program on “**Information Collection of Highly Migratory Species in Southeast Asian Waters**”, the Committee was informed that the implementation of this program is envisaged to help not only the Philippines and Indonesia as members of the Western and Central Pacific Fisheries Commission (WCPFC) in fulfilling its requirements but also Vietnam and Thailand particularly in improving tuna data collection to support the management of tuna fisheries in the region.

21. As to the program on “**Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management**”, the Committee suggested that for analysis of the outputs of the questionnaire survey under this Program using the Statistical Program for Social Sciences (SPSS), SEAFDEC should develop an appropriate model for analyzing the data taking into consideration the number of dependent and independent variables, and should consult with the Member Countries before making an analysis to ensure the consistency of the outputs.

22. With regards to the program on “**Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resources Enhancement**”, the Committee Member for Cambodia suggested that SEAFDEC should consider including a study on deep pool habitats as part of the activities under this project. Considering that the activities undertaken by the Mekong River Commission (MRC) focused on the Lower Mekong River Basin which serve as refuge and spawning grounds of many freshwater species. However, since MRC has planned to conduct an

inception workshop for the new phase of Fisheries Program in early 2011, SEAFDEC was requested to cooperate with MRC on the proposed activity and consolidate this with those to be undertaken by MRC in order to avoid duplication of efforts.

23. With regards to the program on “**Chemical and Drug Residue in Fish and Fish Products in Southeast Asia - Biotoxins Monitoring in ASEAN**”, MFRD was suggested to consider conducting ring trials or proficiency test to ensure reliability and accuracy in the analysis of biotoxins. MFRD was also suggested to develop the criteria for the selection sites in collecting samples for biotoxins monitoring in the region to ensure that the appropriate sites are selected and monitored.

24. For the program on “**Traceability Systems for Aquaculture Products in Southeast Asian Region**”, the Committee Member for Vietnam requested MFRD to assess the status and gaps of traceability systems established in each Member Country, and develop a traceability system for aquaculture products in the ASEAN region, taking into consideration the certification scheme as outlined in the FAO Technical Guidelines on Aquaculture Certification. In this regard, MFRD informed that the focus of this program is to enhance the capacity building of the Member Countries through the conduct of onsite training on Traceability System.

25. The Committee noted that the program on “**Utilization of Freshwater Fish in ASEAN Member Countries**” will be implemented in three countries namely Indonesia, Lao PDR, Myanmar, and Vietnam as agreed at the Forty-second Meeting of the SEAFDEC Council. This program is supported by the Government of Singapore. The meeting noted that the Committee Member for Malaysia expressed the willingness of the country to participate in the project activities on cost sharing-basis.

26. With regards to the Program on the “**Promotion of Sustainable and Region-oriented Aquaculture Practices**”, AQD was suggested to consider conducting activity on the impacts of climate change on aquaculture and study on the use of organic feeds and fish meal substitute in aquaculture. In addition, AQD should transfer the technologies on the production of giant freshwater prawn through the conduct of training courses for officers of BFAR and the private sector.

27. On the program on “**Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release**”, the Committee was informed that Indonesia has undertaken programs on Culture-based Fisheries (“one man one thousand fry”) and stocking of fish fry in natural waters for harvesting in several areas of the country as community-based activities in collaboration with the local communities. Considering that this initiative has close linkage with the program, Indonesia is willing to share the outcomes of the programs with AQD.

28. With regards to the Program on “**Food Safety of Aquaculture Products in Southeast Asia**”, Committee Member for Malaysia informed that under the ASEAN Economic Community (AEC) Blueprint, Malaysia is the lead country for the “Formulation of Guidelines on the Use of the Chemicals in Aquaculture” and has conducted two workshops on the drafting of the said guidelines. Since the guidelines had been finalized for submission to the upcoming ASWGF, the guidelines on the use of antibiotics and chemicals in aquaculture to be prepared by AQD should be harmonized with the guidelines prepared under the ASEAN framework. In addition, The Committee Member for Indonesia also requested that the activities which aim to enhance the safety and traceability of aquaculture products undertaken by MFRD and AQD should be consolidated particularly in the aspect on the use of the antibiotics in the aquaculture.

29. On the “**Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea**”, the Committee Member for the Philippines noted the low utilization of tags in only one tagging site in the country. He requested MFRD to provide the

information on the focal points in order to fully utilize the available tags and maximize the benefits of the country from the tagging activities in the future.

30. For the program on “**Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters**”, MFRDMD should develop guidelines for collecting tissue samples from sea turtles that are accidentally caught in the waters of the Member Countries in order to enhance the genetic studies of sea turtles.

31. While taking note of the various programs and activities implemented by SEAFDEC, the Committee requested the SEAFDEC Secretariat to develop a matrix of all programs showing the possible inter-relationships of the programs, as well as the objectives and tangible outcomes, to make sure that there is no duplication of the programs. Such matrix could also present the continuity of such activities without possible fragmentation.

New Programs from 2011

32. With regards to the program on “**Improvement of Information Gathering System for IUU Fishing Related Countermeasures in the Southeast Asia**”, the Committee recommended that the activities should also include exchanging of information among the countries on the implementation of catch certification as required by European Commission (EC), as well as harmonizing the certification systems of the ASEAN Member Countries in order to facilitate intra-regional trade as well as export of fishery products to other regions.

33. The Committee also suggested that the information on tuna collected by the RFMOs should also be considered in enhancing the information compiled through the program. In addition the program should include how to assist Member Countries in developing their respective National Plan of Action (NPOA) to combat IUU fishing.

34. For the program on “**Promotion on Boats Registration, Fishing License and Port State Measures**”, the Committee suggested to consider the experiences of the Member Countries *e.g.* Malaysia, on improving boats registration and fisheries licensing. In term of data sharing, The Committee Member for Thailand also expressed the apprehension that countries may be reluctant to provide sensitive and confidential information to SEAFDEC which TD and MFRDMD should also take into consideration.

35. Considering the activities on monitoring and evaluating SEAFDEC program as part of the activities under the program on “**Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing Related Countermeasures**”, SEAFDEC was requested to consider the use of the AFCF clusters in the monitoring and evaluation of its programs, and that the members of the Regional Fisheries Policy Network (RFPN) should be mobilized in the implementation of the said activities.

36. The Committee noted that the program on “**Utilization of Freshwater Fish in ASEAN Member Countries**” was supported by the Government of Singapore with activities to be implemented in Indonesia, Lao PDR, Myanmar, and Vietnam as agreed at the Forty-second Meeting of the SEAFDEC Council in 2010. Although Malaysia has not been identified as a participating country, the Committee Member for Malaysia expressed the willingness of the country to participate in the project activities on cost sharing-basis.

Non-funded programs

37. The Committee recommended that SEAFDEC should revisit whether the elements of the non-funded programs have already been incorporated in other SEAFDEC programs, in which case SEAFDEC could propose to remove the non-funded programs from the list.

2.2.3 Other Programs in the Year 2011

38. The Meeting took note of the other SEAFDEC programs proposed for 2011 are as follows:

- 1) Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program
- 2) Promotion of Inland Small-scale Fisheries Management through Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Approaches
- 3) Safety at Sea for Small Fishing Boats

39. With regards to the program on **Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program**, SEAFDEC was requested to communicate with relevant organizations to seek additional support for the cetacean related activities of the region in both coastal and inland waters as well as to avoid the possible duplication of the efforts.

40. With regards to the program on “**Safety at Sea for Small Fishing Boats**” with is recognized having close linkage with the FAO Regional Fisheries Livelihoods Program (RFLP), therefore TD could explore the possibility of seeking funds from the FAO RFLP in the implementation of activities particularly for the development of the training and information materials.

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

41. The Committee took note of the existing six pipeline projects which are still under discussion and negotiation process with potential donor agencies as the following titles:

- 1) Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (Islamic Development Bank or IDB),
- 2) Climate Change and Its Impacts on Sustainable Fisheries and Aquaculture: Adaptation and Mitigation Towards Food Security (ASEAN),
- 3) Promoting Sustainable Food Production through Responsible Fishing Technologies and Practices (ASEAN)
- 4) Strengthen Food Security Arrangements through Fisheries Intervention: Strengthening National and Local Governments in the Development of Food Security Programs/Initiatives (ASEAN)
- 5) Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (UNEP/GEF/SCS)
- 6) Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI)

42. As for the program on “**Climate Change and its Impact on Sustainable Fisheries and Aquaculture: Adaptation and Mitigation Towards Food Security**”, AQD informed the Meeting that AQD is preparing a proposal on the program on climate change for possible funding from other sources through the AFCF with the Philippines as the lead country for climate change as well as for seeking the assistance of FAO through the Philippine Government.

43. With regards to the program on the “**Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand**”, the Committee took note of the difficulty that most Members Countries faced in obtaining new endorsement letters from their respective countries as required by the United Nations Environment Programme/Global Environment Facility (UNEP/GEF). The Committee was informed that the previous project proposal was submitted to seek funding support from GEF 4 of the UNEP/GEF which was completed in June 2010, and that the revised project proposal which would be submitted for funding support from GEF 5 which started in July 2010, had been modified to be in

line with the requirements of GEF 5 Programming Document and the new endorsement letters would be required from all participating countries to UNEP/GEF.

44. For the program on “**Strategies for Trawl Fisheries By-catch Management (REBYC-II/CTI)**” which involves four ASEAN countries in the Coral Triangle Initiatives (CTI), the Committee was informed that non-participating ASEAN countries in REBYC-II could also be involved in the project activities through other related programs of SEAFDEC. Considering its capability in the management of by-catch and reduction of discards, TD has been designated as the Coordinating Unit of REBYC-II.

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

45. The Committee took note of the FAO’s representative outlining the areas of possible collaboration between the two organizations in 2011, particularly the finalization of the proposal and subsequent implementation of REBYC-II. He informed the Meeting that FAO was also requested by GEF to take exercise in the East Asian Sea region and may develop a project proposal which have close linkage with the project of GEF that is being developed by SEAFDEC.

46. Considering that the Ecosystem Approach to Fisheries could be another important area of cooperation, as well as other forthcoming events to be conducted in 2011, particularly the Regional Consultation Workshop on Climate Change in Fisheries and Aquaculture. He also expressed the support of APFIC and BOBLME and their willingness to participate in the ASEAN-SEAFDEC Conference to be organized by SEAFDEC in June 2011.

47. The representative from FAO then informed the Meeting that as several members of SEAFDEC are also participating countries of the BOBLME project, collaboration between BOBLME and SEAFDEC is envisaged to be strengthened in 2011, particularly in the improvement of fishery statistics and information for planning and management of fisheries, the promotion of the Andaman Sea sub-regional cooperation, addressing climate change adaptation activities, mobilization of SEAFDEC research vessel in the conduct of resource surveys, and ecosystem approach to fisheries management training course.

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

30 November – 2 December 2010, Bangkok, Thailand

I. INTRODUCTION

1. The Thirty-third Meeting of the Program Committee of the Southeast Asian Fisheries Development Center (SEAFDEC) was held in Bangkok, Thailand from 30 November to 2 December 2010 and hosted by the Training Department (TD).

2. The Meeting was attended by the National Coordinators from Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, the Republic of the Union of Myanmar, the Philippines, Singapore, Thailand and Vietnam as members of the Program Committee, together with their respective delegations as well as the representative from the FAO Regional Office for Asia and the Pacific (FAO/RAP). The SEAFDEC Secretary-General, Deputy Secretary-General, and Department Chiefs attended together with officers from the Secretariat and the Departments. The list of participants appears as **Annex 1**.

II. OPENING OF THE MEETING

3. The Secretary-General of SEAFDEC, Dr. Chumnarn Pongsri, in his capacity as Chairperson of the Program Committee, welcomed the participants and observers to the Meeting. He highlighted that the years 2010 and 2011 would be the momentous years as SEAFDEC has scheduled to organize the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 “Fish for the People 2020: Adaptation to a Changing Environment” in June 2011. He then requested for collaborative efforts from relevant partners in pursuing its numerous objectives of such Conference. He also stated the importance of the Program Committee Meeting in monitoring the progress of the programs carried out in 2010, and scrutinizing the appropriateness of the proposed future program of SEAFDEC activities in response to the needs and priorities of the Member Countries. He then declared the Meeting open. His Opening Remarks appears as **Annex 2**.

III. ADOPTION OF THE AGENDA AND ARRANGEMENT OF THE MEETING

4. The Committee noted that “Safety at Sea for Small Fishing Boats” will be listed as the Program under Other Programs. The Agenda of the Meeting, which appears as **Annex 3**, was adopted.

**IV. REVIEW OF SEAFDEC PROGRAM IMPLEMENTATION FOR THE YEAR 2010
AND PROPOSED PROGRAMS FOR THE YEAR 2011**

4.1 Departmental Programs

5. While considering the progress and achievements in the implementation of SEAFDEC Departmental Programs in 2010 and the proposed programs for 2011 (**Annex 4**), the Committee provided recommendations for the improvement of the programs and endorsed the programs taking into consideration the respective recommendations.

• **SEAFDEC Secretariat**

6. With regards to the Program on “**Center-wide Information Network**”, the Committee Member for the Philippines expressed appreciation and strong support to the Program which has

enhanced the dissemination of information and promote the initiatives undertaken by SEAFDEC in collaboration with the Member Countries to wide users and public, particularly to local governments during the national consultation events in the Philippines. He also informed the Meeting that during the National Seminars conducted in the Philippines, several participants/stakeholders had expressed their interests to participate in the ASEAN-SEAFDEC Conference and requested SEAFDEC Secretariat to issue invitation letters for their participation to the Conference accordingly.

7. Considering the limited budget for the implementation of SEAFDEC Programs, the Committee Member for Malaysia suggested that the cost of implementation of the Program activities under the Center-wide Information Network should also be provided in the working documents to enable the Committee to assess and recommend possible adjustments of the specific activities corresponding to the availability of budget.

- **Training Department**

8. For the Program on “**Tailor-made Training and Study Tour**”, the Committee was informed that this program has been conducted in the form of training courses in addition to the training courses conducted by the Training Department (TD), under their responsible projects, taking into consideration the capacity of TD in terms of facilities and human resources. The conduct of activities under this program depends on the interest and requirements of the requesting partners and organizations, and the cost incurred including the administrative cost would be shouldered by the requesting organizations/institutions. In addition, TD informed the Committee that some Member Countries have participated in the tailor-made training programs by paying certain training fees based on cost-recovery basis. In 2010, TD had conducted 12 tailor-made training courses with 242 participants. After noting the aforementioned information, the Committee requested TD to also provide further information on the cost for the conduct/participation of the tailor-made training courses including the topics to be offered and the corresponding schedule.

9. Moreover, the Committee was also informed that the Aquaculture Department (AQD) also offers similar type of training courses for requesting organizations, institutions and other partners. In order to enhance the participation of SEAFDEC Member Countries in future tailor-made training programs conducted by the SEAFDEC Departments, the Committee requested the concerned Departments to keep the Member Countries informed on the relevant activities (*i.e.* regular training courses and tailor-made training courses) by providing the countries with the schedule in advance.

10. In this connection, the Committee was also informed that SEAFDEC has been requested by the Colombo Plan to implement a one week tailor-made Training Workshop in 2011 on the Promotion of “One Village, One Fisheries Products (FOVOP)” under the Memorandum of Understanding between SEAFDEC and the Colombo Plan which was signed in April 2010. For this training workshop, the Colombo Plan would provide certain funds for the participation of its eligible Member Countries, while other SEAFDEC Member Countries could join the training course on cost-recovery basis.

- **Aquaculture Department**

11. The Committee was informed that AQD’s Departmental Programs will shift from commodity-based approach to thematic approach in 2012, in accordance with the thematic areas discussed during the Regional Technical Consultation on Sustainable Aquaculture Development conducted in March 2010 as part of the preparatory works for the Conference in June 2011.

12. While congratulating AQD for the programs that it implements, the Committee suggested that on top of the current technology transfer strategies such as training, printing and distribution of information materials (*i.e.* printed and audio-visual) and continuous updating of the AQD website, AQD should also explore more venues and fora for the exchange of experiences and knowledge gained as well as the outcomes and achievements from such programs with the Member Countries and *vice versa*. With regards to training, a cost sharing mechanism is presently being practiced wherein AQD forgoes the training fee but the trainees shoulder the transportation and lodging during the course duration. In addition, with the information on aquaculture that it has amassed which could be useful for the region, AQD was asked to consider expanding its network of information among the fisheries departments and related agencies within the region through linking with the regional and national libraries of the Member Countries.

13. For the Program on “**Mud Crab and Shrimp Domestication**”, the Committee Member for Myanmar informed the Meeting that in view of the over-exploitation of the natural mud crab resources in his country, the technical assistance from AQD on mud crab production would be very useful in its efforts to rehabilitate such resources. He also informed the Meeting that the Government of Myanmar has planned to promote freshwater aquaculture as alternative livelihood to reduce poverty of the rural poor people. He therefore acknowledged with gratitude the technical assistance from AQD and the financial support from the Japanese Trust Fund for the conduct of a training course on health management in aquaculture in December 2010. He also informed the Meeting that his country is also seeking the assistance of the Japan International Cooperation Agency (JICA) for the promotion of small-scale sea bass aquaculture in the country to improve the socio-economic conditions of fishers. While thanking AQD for technical support and the Government of Japan for providing the necessary funds for the various activities conducted in the country, the Meeting was informed that Myanmar would further communicate with AQD on the planned activities and the corresponding technical advice necessary especially in the breeding of the catfish, *Clarias batrachus*.

14. For the “**Marine Fish Program**”, the Committee supported the conduct of research on the replacement of fish meal with plant-based raw materials (phyto-protein) which is crucial for the development of the region’s aquaculture industry. Specifically, the Committee Member for Thailand reiterated that the issue on fish meal replacement has been raised as one of the clusters under the ASEAN Fisheries Consultative Forum (AFCF), and that the outcomes of the research activities conducted by AQD should be shared with the Member Countries. Thus, AQD informed the Meeting that it has conducted trials on the use of soybean meal and other plant-based protein sources in aquafeeds and is presently looking at the biotechnology aspect to improve the digestibility of plant-based protein as source of feeds for carnivore marine species.

15. With regards to the Program on “**Seaweed Strain Improvement**”, AQD was asked to continue disseminating the scientific information on seaweed production and to consider the conduct of the workshop or the training course on the topic. In addition, the Committee Member for Indonesia informed the Meeting that Indonesia has developed the technology for certain seaweed production through tissue culture and red seaweed production especially for *Halymenia* sp. and *Porphyra* sp. and would share the information with AQD.

16. With regards to information dissemination, AQD informed the Committee that the scientific outputs resulting from its research activities are published in international journals which are later on simplified into manuals and used in training programs. As for the conduct of the training courses, AQD is now conducting limited regular training courses due to budgetary constraints. However, apart from regular courses, special training courses are conducted for requesting parties on cost-sharing basis. Examples of such courses/seminars were on giant freshwater prawn seed production, culture of soft shell mud crab and production which were conducted in Brunei Darussalam with training-related expenses borne by the Department of Fisheries of Brunei Darussalam. In addition, the simplified information is also disseminated to the Member Countries through various audio-visual materials and in the internet.

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

17. The Committee considered and endorsed the progress and achievements in the implementation of the programs under the Fisheries Consultative Group Mechanism of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) in 2010 and the proposed activities for 2011 as well as the new programs and non-funded programs (**Annex 5**).

- **SEAFDEC Secretariat**

18. For the Program on “**Assistance for Capacity Building in the Region to Address International Trade-related Issues**”, the Committee suggested that Fisheries Subsidies should also be included in the program considering the new designation of the Chair of the negotiation group on Rules. The new Chair is expected to come up with the new text on fisheries subsidies during the present negotiation rounds. In this regards, the Committee requested SEAFDEC to provide the platform for Member Countries to discuss their views and comments (*e.g.* on Special and Differential Treatment, definition of small-scale fisheries, exemption for poverty alleviation, safety at sea, and food security) and that the resulting common position would be submitted to the forthcoming negotiation round of the WTO.

19. In addition, the Committee Member for Indonesia requested SEAFDEC to also include in the discussion, quality and safety issues in international trade-related issues as well as sustainability and conservation of sharks. He also informed the Meeting that Indonesia has produced a manuscript on sharks in Indonesia in the Indonesian and English languages, and would share the information with SEAFDEC and other Member Countries. He also requested SEAFDEC to develop practical guide for the identification of shark species in the Southeast Asian waters as well as the methodologies for identifying shark species through the dried shark fins.

20. The Committee Member for Thailand informed the Meeting that the Technical Guidelines on Aquaculture Certification had already been endorsed by the FAO COFI Sub-committee on Aquaculture and would be submitted for final endorsement at the next COFI Meeting. However, since there are still issues of urgent concern in several Member Countries such as those that concern the Animal Health and Welfare, such issues should be considered under this Program.

21. With regards to the Program on “**Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region**”, the Committee noted that SEAFDEC has developed the new Framework for Fishery Statistics of Southeast Asia, which includes standards, classification and definitions of fishery statistics that had been harmonized with the international standards, classification and definitions. The new Framework has been endorsed by the high authorities of the ASEAN and SEAFDEC which would serve as basis for the compilation of the SEAFDEC Fishery Statistical Bulletin for Southeast Asia from 2008 and onwards. In addition, the Framework could also serve as the Minimum Requirements for Member Countries in the development/improvement of their respective national fishery statistical systems and mechanisms. The Committee was also informed that, in order to reduce the burden of the Member Countries in submitting fishery statistics and information to SEAFDEC and FAO for the compilation at regional and global levels, the reporting system has also been streamlined through the use of harmonized questionnaires and streamlined submission processes and mechanism as agreed among the Member Countries, SEAFDEC and FAO.

22. The representative from FAO/RAP expressed the interest to cooperate with SEAFDEC in the development of the Southeast Asian Status and Trends of Fisheries and Aquaculture (SEASOFIA) considering that the Asia-Pacific Fisheries Commission (APFIC) has been producing the biennial publication "Status and Trends of Fisheries and Aquaculture in Asia and the Pacific" with specific chapter for the Southeast Asian region and the South China Sea. The information in the SEASOFIA could therefore serve as inputs to the APFIC publication, as well

as to the State of World Fisheries and Aquaculture (SOFIA) developed by FAO at a global level. APFIC therefore looked forward to cooperate with SEAFDEC in the harmonization of the SEASOFIA with the APFIC and FAO publications. The Committee however, noted that since the production of SEASOFIA requires significant expertise and resources, SEAFDEC could come up with a preliminary version of the SEASOFIA first, and would explore the possibility of seeking assistance from the Member Countries on the appropriate direction to proceed with the initiative in the future.

23. For the Program on “**Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea**”, the representative from FAO/RAP informed the Meeting on the possible funding support for the implementation of the activities, such as the Global Environmental Facility (GEF) of which Lao PDR and Cambodia have been identified as among the eligible countries to develop and submit the necessary proposal for funding support. In addition, the Later Stage Support Fund (LSSF) is also another source of funding for the activities, however, this would require co-financial support from the concerned countries. He then expressed his willingness to help the SEAFDEC Member Countries in accessing to such sources of funds. He also informed the Committee that APFIC is planning to organize a Regional Consultation Workshop on Climate Change in May 2011, and invited SEAFDEC to participate and provide inputs on the actions that could be undertaken at the regional level.

24. The Committee took note of the program on “**Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in the ASEAN Region**” and the program on “**Human Resource Development (HRD) for Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region**”, which had already been successfully completed. Considering that the Regional Guidelines on FOVOP had already been endorsed by higher authorities of the ASEAN and SEAFDEC, the Committee encouraged the Member Countries to continue the implementation of such initiatives at the national level. In this connection, the Committee Member for the Philippines recommended that SEAFDEC should continue to communicate and follow-up with the focal point in each country in order to monitor the implementation of the initiatives after the completion of the project. With regards to the HRD project, the Regional Policy Recommendations on HRD for Poverty Alleviation by Fisheries Intervention would be submitted to the higher authorities of the ASEAN-SEAFDEC at the upcoming Meetings.

25. With regards to the “**ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020**”, the Committee took note of the discussions made during the 18th Meeting of the ASEAN Sectoral Working Group on Fisheries (ASWGF_i) on the drafting of the Resolution and Plan of Action to be adopted by the ASEAN-SEAFDEC Ministers responsible for fisheries during the Ministerial Session of the Conference which should be undertaken by the ASEAN Member Countries. In order to facilitate the drafting process, SEAFDEC would provide the outputs from the Regional Technical Consultations and Sub-regional Public/Private Sector Dialogues as well as the analysis of the progress and achievements of implementation by the Member Countries of the 2001 Resolution and Plan of Action. In this connection, the Committee Member for Thailand expressed the need to obtain the services of appropriate resource person(s), which should take into consideration their knowledge and expertise in wide scope of fisheries in the region, to support the drafting process.

26. In order to ensure the availability of the information that could serve as basis for the drafting of the new Resolution and Plan of Action, the Member Countries were requested to submit their inputs as required by SEAFDEC (*e.g.* outputs from National Seminars and evaluation of the implementation of the Resolution and Plan of Action 2001) to the SEAFDEC Secretariat the soonest time possible. In this connection, the Program Committee Members for Brunei Darussalam, Myanmar and the Philippines informed the Meeting that the national events in preparation of the Conference were successfully conducted in their respective countries, of which the outputs would be submitted to SEAFDEC in due course.

27. Furthermore, the Committee Member for Japan reiterated that the Resolution and Plan of Action to be adopted by the ASEAN-SEAFDEC Ministers during the June 2011 Conference should provide the framework and guiding principle for countries in the region in achieving sustainable fisheries and food security during the coming decade. He, therefore, suggested that the programs to be implemented by SEAFDEC starting in 2011 should be prioritized and made flexible, in order to incorporate the issues such as fisheries governance initiative specified in the new Resolution and Plan of Action.

- **Training Department**

28. For the program on “**Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)**”, the Committee suggested that TD should include the preparation of the regional guidelines on fish by-catch management and discards reduction taking into consideration the international guidelines on by-catch management and discards reduction which had already been submitted to the FAO Technical Consultation for the Development of Guidelines on By-catch Management and Discards Reduction to be held on 6-10 December 2010 in Rome, Italy. In order to provide information that could possibly provide adjustments in the guidelines to suit with the characteristics of resources of the SEAFDEC Member Countries and put emphasis on responsible fishing technologies in the region, this program should be linked with the national management plans in the Member Countries.

29. In this connection, the Committee Member for the Philippines informed the Meeting that the country has developed management plans for specific species such as tuna, sardines and blue swimming crab, and requested TD to consider developing responsible fishing technologies that could sustain the exploitation of these species in the future.

30. Under the Program on “**Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2**”, the Committee expressed the concern on the decline of the use of the vessel and urged SEAFDEC to explore the possibility of maximizing its utilization in the region. The Committee Member for Japan, while sharing the similar concern and observation that such trend could affect the conduct of collaborative projects in the region, suggested that SEAFDEC should consider planning the activities that could maximize the utilization of the M.V. SEAFDEC 2. In this connection, the Committee Member for Brunei Darussalam informed to the Committee that Brunei Darussalam proposed to use the M.V. SEAFDEC 2 in mid 2011 the details of which would be further discussed with TD taking into consideration the scheduled Conference in June 2011.

31. Regarding the program on “**Deep Sea Fisheries Resources Exploration in Southeast Asia**”, the Committee Member for the Philippines commended the efforts of TD in conducting onboard identification of plankton and fish larvae as well as the oceanographic survey which are useful for the Philippines fisheries officers. Through such activities, some deep sea fisheries resources within the Philippines territorial waters had been identified. However, during the identification of deep sea fisheries resources, TD should also include activities aimed at estimating the volume of the resources in order to investigate the feasibility of commercial investments in deep sea fishing. In addition, appropriate fishing gears/vessels (or modification of existing gears/vessels) should also be investigated to exploit these resources. In this connection, the Committee expressed strong support for TD to continue the training and expressed the intention to participate in the program. In addition, the Committee Member for Vietnam also requested TD to conduct the research study and training on deep sea resources exploration on cost sharing basis.

32. With regards to the program on “**Information Collection of Highly Migratory Species in Southeast Asian Waters**”, the Committee Member for the Philippines while supporting the implementation of activities in Indonesia, the Philippines, Thailand and Vietnam (IPTV

countries), informed the Meeting that the Philippines and Indonesia are members of the Western and Central Pacific Fisheries Commission (WCPFC). The implementation of this program is envisaged to help the Philippines and Indonesia in fulfilling the requirements of WCPFC particularly in improving tuna data collection to support the management of tuna fisheries.

33. As to the program on “**Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management**”, the Committee Member for Vietnam suggested that for analysis of the outputs of the questionnaire survey under this Program using the Statistical Program for Social Sciences (SPSS), SEAFDEC should develop an appropriate model for analyzing the data taking into consideration the number of dependent and independent variables, and should consult with the Member Countries before making an analysis to ensure the consistency of the outputs.

34. With regards to the program on “**Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resources Enhancement**”, the Committee Member for Cambodia suggested that SEAFDEC should consider including a study on deep pool habitats as part of the activities under this project. Considering that the activities undertaken by the Mekong River Commission (MRC) focused on the Lower Mekong River Basin, this project should therefore put more emphasis on the deep pools in the Upper Mekong River Basin, which serve as refuge and spawning grounds of many freshwater species. However, since MRC has planned to conduct an inception workshop for the new phase of Fisheries Program in early 2011, SEAFDEC was requested to cooperate with MRC on the proposed activity and consolidate this with those to be undertaken by MRC in order to avoid duplication of efforts.

- **Marine Fisheries Research Department**

35. With regards to the program on “**Chemical and Drug Residues in Fish and Fish Products in Southeast Asia - Biotoxins Monitoring in ASEAN**”, the Committee Member for Thailand suggested that MFRD should consider conducting ring trials or proficiency test to ensure reliability and accuracy in the analysis of biotoxins. She also suggested that MFRD should develop the criteria for the selection sites in collecting samples for biotoxins monitoring in the region to ensure that the appropriate sites are selected and monitored.

36. For the program on “**Traceability Systems for Aquaculture Products in Southeast Asian Region**”, the Committee Member for Vietnam requested MFRD to assess the status and gaps of traceability systems established in each Member Country, and develop a traceability system for aquaculture products in the ASEAN region, taking into consideration the certification scheme as outlined in the FAO Technical Guidelines on Aquaculture Certification which comprised the criteria on food security, animal health and welfare, environmental integrity, and social responsibility. In response, MFRD informed the Meeting that during the Regional Technical Consultation on the Traceability Systems for Aquaculture Products in the Southeast Asian Region conducted on 12-14 October 2010 in Singapore, the status and application of traceability system was reported by each Member Country. In addition, the Meeting was informed that the focus of the program is to enhance the capacity building of the Member Countries through the conduct of onsite training on Traceability System.

37. The Committee noted that the program on “**Utilization of Freshwater Fish in ASEAN Member Countries**” is supported by the Government of Singapore with activities to be implemented in Indonesia, Lao PDR, Myanmar, and Vietnam as agreed at the Forty-second Meeting of the SEAFDEC Council in 2010. The Committee Member for Myanmar expressed strong support to the program considering the importance of freshwater fish for local consumption and as raw materials for various fisheries products for the country. Likewise, the Committee Member for Lao PDR also supported the program considering the importance of freshwater fishes for food security of the country. Although Malaysia has not been identified as a participating

country, the Committee Member for Malaysia expressed the willingness of the country to participate in the project activities on cost sharing-basis.

- **Aquaculture Department**

38. With regards to the Program on the “**Promotion of Sustainable and Region-oriented Aquaculture Practices**”, the Committee Member for the Philippines suggested that AQD should consider conducting activity on the impacts of Climate Change on aquaculture as this is very important in the ASEAN region as the main producer of aquaculture products. He also suggested that AQD should conduct studies on the use of organic feeds and fish meal substitute in aquaculture such as earth worms, and that AQD should transfer the technologies on the production of giant freshwater prawn through the conduct of training courses for officers of BFAR and the private sector.

39. On the program on “**Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release**”, the Committee Member for Indonesia informed the Meeting that Indonesia has undertaken programs on Culture-based Fisheries (“one man one thousand fry”) and stocking of fish fry in natural waters for harvesting in several areas of the country as community-based activities in collaboration with the local communities. Considering that this initiative has close linkage with the program, Indonesia is willing to share the outcomes of the programs with AQD.

40. With regards to the program on “**Food Safety of Aquaculture Products in Southeast Asia**”, the Committee Member for Malaysia informed the Committee that under the ASEAN Economic Community (AEC) Blueprint, Malaysia is the lead country for the “Formulation of Guidelines on the Use of the Chemicals in Aquaculture” and has conducted two workshops on the drafting of the said guidelines. Since the guidelines had been finalized for submission to the upcoming ASWGFi, the guidelines on the use of antibiotics and chemicals in aquaculture to be prepared by AQD should be harmonized with the guidelines prepared under the ASEAN framework. The Committee Member for Indonesia also requested that the activities which aim to enhance the safety and traceability of aquaculture products undertaken by MFRD and AQD should be consolidated particularly in the aspect on the use of the antibiotics in aquaculture. He also informed the Meeting that the use of antibiotics in aquaculture is banned in his country and requested AQD to assist other Member Countries in building their capacities to minimize the use of antibiotics in aquaculture.

41. The Committee Member for Thailand requested AQD to consider including other types of antibiotics in the conduct of its surveillance activities that currently focus only on oxytetracycline and oxoleic acid. In response, AQD informed the Meeting that AQD will organize an International Seminar of Food Safety in Aquaculture in Southeast Asia in January 2011, where the most commonly used antibiotics in aquaculture in the region would be identified and would be incorporated in future activities based on the available budget.

42. The Committee Member for Brunei Darussalam reiterated the need to consolidate the programs and projects of SEAFDEC to make sure that these are of regional nature and address the needs and requirements of the countries in the region.

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

43. On the “**Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea**”, the Committee Member for the Philippines noted the low utilization of tags in only one tagging site in the country. He requested MFRDMD to provide the information on the focal points in order to fully utilize the available tags and maximize the benefits of the country from the tagging activities in the future. He also requested MFRDMD to consider including sardines in the tagging program considering that the information on spawning

areas and migratory route of this species is important for the fishing industry and management of sardines in the country. In response, MFRDMD informed the Meeting that it would consult with the other Member Countries on the request of the Philippines to include such species in the activities in 2013.

44. While considering the collection of information on sea turtles under the Program on “**Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters**”, the Committee Member for the Philippines informed the Meeting that there are two agencies involved in sea turtle conservation and management in his country, *i.e.*, BFAR for the fisheries aspect and the Protected Area and Wildlife Bureau (PAWB) of the Department of Environment and Natural Resources for the conservation aspect. In this connection, he suggested that MFRDMD should consider the involvement of PAWB and BFAR in the conduct of relevant activities under this program.

45. The Chairperson of the Committee suggested that in order to enhance the genetic studies of sea turtles, MFRDMD should develop guidelines for collecting tissue samples from sea turtles that are accidentally caught in the waters of the Member Countries. By making use of the guidelines, the Member Countries could assist MFRDMD in the collection of the tissue samples together with the ecological data of the foraging areas and send the samples with the relevant information to MFRDMD for analysis and compilation.

46. While taking note of the various programs and activities implemented by SEAFDEC, the Committee requested the SEAFDEC Secretariat to develop a matrix of all programs showing the possible inter-relationships of the programs, as well as the objectives and tangible outcomes, to make sure that there is no duplication of the programs. Such matrix could also present the continuity of such activities without possible fragmentation.

- **New Programs**

47. For the “**Improvement of Information Gathering System for IUU Fishing Related Countermeasures in the Southeast Asia**”, the Committee Member for Malaysia while supporting the program, recommended that the activities should also include exchanging of information among the countries on the implementation of catch certification as required by European Commission (EC), as well as harmonizing the certification systems of the ASEAN Member Countries in order to facilitate intra-regional trade as well as export of fishery products to other regions.

48. While supporting the program, the Committee suggested that since some SEAFDEC Member Countries are members of Tuna Regional Fisheries Management Organizations (Tuna RFMOs), the information on tuna collected by the RFMOs should also be considered in enhancing the information compiled through the program. Moreover, since the Regional Plan of Action (RPOA) to combat IUU fishing in the Region was endorsed by the Ministers of some ASEAN Member Countries and the FAO International Plan of Action have already been published, the Committee Member for Indonesia suggested that TD should assist the Member Countries in developing their respective National Plans of Action (NPOA) to combat IUU fishing. However, fisheries in inshore and offshore waters should be appropriately classified and differently treated in the formulation of the NPOA to combat IUU Fishing.

49. For the program on “**Promotion on Boats Registration, Fishing License and Port State Measures**”, the Committee Member for Vietnam suggested that in the implementation of this program TD should take into consideration the experiences of the Member Countries, *e.g.* Malaysia, on improving boats registration and fisheries licensing. She also inquired on the data required and the target users of the database of fisheries product and also expressed the concern that this information would not meet the objectives of the IUU fishing prevention. The Committee Member for Thailand also expressed the apprehension that countries may be reluctant to provide

sensitive and confidential information to SEAFDEC which TD and MFRDMD should also take into consideration.

50. With regards to the program on “**Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing Related Countermeasures**”, the Committee Member for Thailand, while supporting the activities on monitoring and evaluating SEAFDEC program that address sustainable fisheries development and combat IUU fishing, informed the Meeting that SEAFDEC has been identified as participating organization in several clusters under the AFCF mechanism. SEAFDEC should therefore, consider the use of the AFCF clusters in the monitoring and evaluation of its programs, and that the members of the Regional Fisheries Policy Network (RFPN) should be mobilized in the implementation of the said activities.

- **Non-funded programs**

51. The Committee recommended that SEAFDEC should revisit whether the elements of the non-funded programs have already been incorporated in other SEAFDEC programs, in which case SEAFDEC could propose to remove the non-funded programs from the list.

4.3 Other Programs (Annex 6)

52. For the “**Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program**”, the Committee Member for Cambodia expressed its appreciation to the Government of Japan through its biodiversity funds and relevant agencies concerned for conducting studies on the Irrawaddy dolphins and other endangered species in freshwater ecosystem. In this connection, SEAFDEC was requested to communicate with relevant organizations to seek additional support for the cetacean related activities of the region in both coastal and inland waters as well as to avoid the possible duplication of the efforts.

53. For the program on the “**Promotion of Inland Small-scale Fisheries Management through Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Approaches**”, the Committee Member for Myanmar suggested that since the current schedule for the conduct of the workshop/seminar on rights-based fisheries management in Myanmar has been proposed during the long holiday, TD should consult with Myanmar through its RFPN member on the appropriate timing of such workshop/seminar.

54. With regards to the program on “**Safety at Sea for Small Fishing Boats**”, the representative from FAO/RAP informed the Meeting that this program has close linkage with the FAO Regional Fisheries Livelihoods Program (RFLP) in which four countries in the region namely; Indonesia, Cambodia, the Philippines and Vietnam are eligible to participate. TD could explore the possibility of seeking funds from the FAO RFLP in the implementation of activities, particularly for the development of the training and information materials. Moreover, considering the importance of addressing the concerns related to the welfare of small-scale fishers in the region, the representative from FAO/RAP informed the Meeting that FAO, Bay of Bengal Program-Intergovernmental Organization (BOBP-IGO) and the Alaska Pacific Regional Office of the National Institute for Occupational Safety and Health will organize the workshop on Improving Safety and Health of Fishing Communities in Chennai, India in December 2010, and that SEAFDEC has been invited to take part in the workshop to enhance its program on safety at sea for small-scale fishing boats.

V. PIPELINE PROJECTS AND EMERGING NEEDS FOR PREPARATION OF FUTURE PROJECT PROPOSALS (Annex 7)

55. As for the program on “**Climate Change and Its Impact on Sustainable Fisheries and Aquaculture: Adaptation and Mitigation Towards Food Security**”, AQD informed the Meeting that AQD is preparing a proposal on the program on climate change for possible funding

from other sources through the AFCF with the Philippines as the lead country for climate change as well as for seeking the assistance of FAO through the Philippine Government.

56. With regards to the program on the “**Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand**”, the Committee took note of the difficulty that most Members Countries faced in obtaining new endorsement letters from their respective countries as required by the United Nations Environment Program/Global Environment Facility (UNEP/GEF). The Committee was informed that the previous project proposal was submitted to seek funding support from GEF 4 of the UNEP/GEF which was completed in June 2010, and that the revised project proposal which would be submitted for funding support from GEF 5 which started in July 2010, had been modified to be in line with the requirements of GEF 5 Programming Document and the new endorsement letters would be required from all participating countries to UNEP/GEF.

57. For the program on “**Strategies for Trawl Fisheries By-catch Management (REBYC-II/CTI)**”, the Committee Member of the Philippines commended TD for the successful completion of REBYC-I and the introduction of the Juvenile and Trash fish Excluder Devices (JTEDs) designed by TD as it has facilitated the promotion of sustainable fisheries management in the country, and informed the Meeting that the country is willing to share the available information to the other countries in the region. Based on the experience in REBYC-I, he supported the conduct of REBYC-II which involves four ASEAN countries in the Coral Triangle Initiatives (CTI). The Meeting was also informed that non-participating ASEAN countries in REBYC-II could also be involved in the project activities through other related programs of SEAFDEC. The representative from FAO/RAP commended SEAFDEC for the successful formulation of the project proposal on REBYC-II for funding by FAO/GEF. Considering its capability in the management of by-catch and reduction of discards, TD has been designated as the Coordinating Unit of REBYC-II.

VI. OTHER MATTERS

6.1 Outline of Japanese Trust Fund (Annex 8)

58. The Committee was informed that although there are several activities proposed to be implemented under the Japanese Trust Fund (JTF) program, however, the plan of activities would have to be readjusted in order to accommodate the issues that would be addressed in the Resolution and Plan of Action to be adopted during the ASEAN-SEAFDEC Conference in June 2011.

6.2 Others

59. The Committee Member for Thailand expressed the view that since some Departments implements few projects, she suggested that MFRD should undertake more activities that address the issues on quality and safety of fish and fishery products. Though Thailand is appreciated the various projects/programs done by AQD, she stressed future activities should be focused and contributed at the regional level. She added that the issues to be addressed by SEAFDEC related to climate change should be prioritized and that AQD should conduct training and study visits to AQD to showcase its programs and activities. On the project related to the Climate Change and Food Security, the Committee Member for Indonesia urged SEAFDEC to collaborate with the Regional Secretariat of the Coral Triangle Initiative for Fisheries and Food Security.

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

60. The representative from FAO/RAP, Dr. Simon Funge-Smith expressed his appreciation to SEAFDEC for extending the invitation to FAO to participate in the SEAFDEC Program Committee Meeting, as well as the willingness of FAO to collaborate with SEAFDEC in the areas

of common interest. He outlined the areas of possible collaboration between the two organizations in 2011, particularly the finalization of the proposal and subsequent implementation of REBYC-II. He informed the Meeting that FAO was also requested by GEF to take exercise in the East Asian Sea region and may develop a project proposal which have close linkage with the project of GEF that is being developed by SEAFDEC. He emphasized that the Ecosystem Approach to Fisheries could be another important area of cooperation, as well as other forthcoming events to be conducted in 2011, particularly the Regional Consultation Workshop on Climate Change in Fisheries and Aquaculture. He also expressed the support of APFIC and BOBLME and their willingness to participate in the ASEAN-SEAFDEC Conference to be organized by SEAFDEC in June 2011.

61. The representative from FAO/RAP then informed the Meeting that as several members of SEAFDEC are also participating countries of the BOBLME project, collaboration between BOBLME and SEAFDEC is envisaged to be strengthened in 2011, particularly in the improvement of fishery statistics and information for planning and management of fisheries, the promotion of the Andaman Sea sub-regional cooperation, addressing climate change adaptation activities, mobilization of SEAFDEC research vessel in the conduct of resource surveys, and ecosystem approach to fisheries management training course. He also reiterated that the activities under the FAO Regional Fisheries Livelihoods Programme implemented in some SEAFDEC Member Countries, namely Vietnam, Cambodia, the Philippines and Indonesia, have close linkage with SEAFDEC activities as well as the implementation of the FAO Legally-binding Port State Measure which would be put into force in the near future. His statement appears as **Annex 9**.

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

8.1 Adoption of Report of the Meeting

62. The Committee adopted the report of the Thirty-third Meeting of the SEAFDEC Program Committee on 2 December 2010. The Meeting noted that the Report would be further submitted to the 43rd Meeting of SEAFDEC Council and to ASEAN through the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP), respectively.

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

63. The Chief of AQD expressed his Department's willingness to host the Thirty-fourth Meeting of the Program Committee in the Philippines in November 2011. AQD would further coordinate with the Secretariat in finalizing the schedule and related arrangements for the Meeting including the date and venue of the Meeting.

IX. CLOSING OF THE MEETING

64. The Chairperson of the Program Committee, Dr. Chumnarn Pongsri expressed his appreciation to the Program Committee Members as well as the other participants of the Meeting for their active participation during the deliberation on the SEAFDEC programs as well as on other program matters, which allowed the Meeting to come up with fruitful outcomes. He then assured the Committee that SEAFDEC would do its best to address the issues considered and in following-up both the program and non-program matters of this Meeting, and declared the Meeting closed. His Closing Remarks appears as **Annex 10**.

Annex 1

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OPENING REMARKS

By Dr. Chumnarn Pongsri, SEAFDEC Secretary-General

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

Good Morning and welcome to the Thirty-third Meeting of SEAFDEC Program Committee. Before going any further, I would like to thank the TD staff for their efforts in making the necessary arrangements for all of us during this Meeting.

The years 2010 and 2011 would be very momentous years in the annals of SEAFDEC. Certainly, these are the busiest years for we have scheduled to organize the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security towards 2020, "Fish for the People 2020: Adaptation to a Changing Environment" in June next year with heavy preparations underway this year. Although we are faced with a limited budget compared with that of the 2001 Conference, I personally acknowledge that even with the huge burden of works that awaits our utmost collaborative efforts the quality of work should be maintained.

As you are all aware of, this Program Committee Meeting will review the implementation of the ongoing programs and consider the programs proposed for 2011. Specifically under the FCG/ASSP programs, we will also discuss the progress of the preparations for the much awaited June 2011 Conference. This Meeting is therefore vitally important as it sets the tone and trend of the future work of SEAFDEC in accordance with the instructions given by the SEAFDEC Council at its Forty-second Meeting as well as the framework that would be set from the Resolution and Plan of Action that would be adopted during the June 2011 Conference.

As proposed, the programs for the year 2011 have taken into consideration the fast-changing international and regional conditions, regulations, agreements and regimes for combating IUU fishing, which had been considered as the main cause of the depletion of the fish stocks, destruction of marine habitats as well as the losses of both short-and long-term social and economic opportunities, and which could have negatively impacted on the region's efforts towards achieving food security. Thus, the effective tools to combat such negative trends and enhance capacity building have been considered as the over-riding principles in our proposed programs of activity.

Since the programs and proposals considered by this Program Committee Meeting together with its recommendations, will be submitted to the next Council Meeting for final endorsement and the relevant programs through the Fisheries Consultative Group Meeting of the ASEAN-SEAFDEC Strategic Partnership during its meeting which will be held back-to-back with this Program Committee Meeting, I would therefore wish to invite all of you to closely examine and if there is probable cause, to criticize the directions, objectives and activities of the proposed programs of activity. We would welcome your advice, ideas and suggestions in order to improve the programs and to make sure that these more suitable with the requirements of the region.

Ladies and Gentlemen, we would also wish to request your utmost cooperation and active participation in the discussions as your inputs are crucial to make this Meeting a pathway to even greater success in the years ahead of us. On that note, Ladies and Gentlemen, I now declare the Thirty-third Meeting of SEAFDEC Program Committee opened. Thank you.

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 2010 and Proposed Programs for the Year 2011

3.1 Departmental Programs¹

3.1.1 Secretariat

- Center-wide Information Network

3.1.2 Training Department

- Information and Communications Technology
- Tailor-made Training and Study Tour

3.1.3 Aquaculture Department

- Integrated Mollusk Production
- Mud Crab and Shrimp Domestication
- Marine Fish
- Small-holder Freshwater Aquaculture
- Seaweed Strain Improvement
- Aquatic Ecology

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

3.2.1 Secretariat

- Assistance of Capacity Building in the Region to Address International Trade-related Issues
- Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region
- Activities related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea
- Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in ASEAN Region²
- Human Resource Development (HRD) for Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region³
- ASEAN-SEAFDEC Conference on Sustainable Development of Fisheries and Food Security Towards 2020

3.2.2 Training Department

- Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)
- Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses
- Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2

¹ Marine Fisheries Research Department (MFRD) and Marine Fishery Resources Development and Management Department (MFRDMD) have no Departmental Programs.

² The Program completed during the first quarter of 2010

³ The Program completed during the third quarter of 2010

- Deep Sea Fisheries Resources Exploration in the Southeast Asia
 - Information Collection of Highly Migratory Species in Southeast Asian Waters
 - Development of Regional Database for Fishery Management
 - Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management
 - Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement
- 3.2.3 Marine Fisheries Research Department
- Chemical and Drug Residues in Fish and Fish Products in Southeast Asia: Biotoxins Monitoring in ASEAN
 - Traceability Systems for Aquaculture Products in the ASEAN Region
 - Utilization of Freshwater Fish for Value-added Products⁴
- 3.2.4 Aquaculture Department
- Promotion of Sustainable and Region-oriented Aquaculture
 - Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release
 - Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia
 - Food Safety of Aquaculture Products in Southeast Asia
- 3.2.5 Marine Fishery Resources Development and Management Department
- Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea
 - Research and Management of Sea Turtles in Foraging Habitat in the Southeast Asia Waters
- 3.2.6 New Programs
- Improvement of Information Gathering System for IUU Fishing Related Countermeasures in the Southeast Asia
 - Promotion on Fishing License, Boats Registration, and Port State Measures
 - Human Resource Development for Sustainable Fisheries
 - Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing Related Countermeasures
- 3.2.7 Non-funded Programs⁵
- The Use of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region
 - Development of Integrated Inland Fisheries Management in ASEAN Countries
 - Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty⁶

⁴ The Program is transferred from the non-funded program on “Utilization of Freshwater Fish in ASEAN Member Countries”. A proposed new title as appeared will be supported by the Government of Singapore starting from 2011 for three years under the ASSP/FCG. However, the Program activities will target only some Member Countries due to limitation of the budget.

⁵ As agreed by the lead countries at the 16th ASWGFi Meeting, the program that has been no progress of activities will be put under a list of ‘Non-funded Programs’.

⁶ This Program will be linked with the pipeline project on “Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management”.

3.3 Other Programs

- Cetacean Research in Southeast Asia Waters: Cetacean Sighting Program
- Promotion of Inland Small-scale Fisheries Management through Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Approaches
- Safety at Sea for Small Fishing Boats

- Agenda 4:** Pipeline Projects and Emerging Needs for Preparation of Future Project Proposals
- Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (SEC-TD/Islamic Development Bank)
 - Climate Change and Its Impacts on Sustainable Fisheries and Aquaculture: Adaptation and Mitigation Towards Food Security (SEC/ASEAN)
 - Promoting Sustainable Food Production through Responsible Fishing Technologies and Practices (SEC/ASEAN)
 - Strengthen Food Security Arrangements through Fisheries Intervention: Strengthening National and Local Governments in the Development of Food Security Programs/Initiatives (SEC/ASEAN)
 - Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (SEC/UNEP/GEF/SCS)
 - Improved Fisheries Management through an Ecosystems Approach to Fisheries by Development and Management of *Refugia* and Marine Protected Areas in the Eastern Gulf of Thailand (SEC/EU)
 - Strategies for Trawl Fisheries By-catch Management (REBYC-II CTI) (**NEW**)

Agenda 5: Other Matters

- 5.1 Outline of Japanese Trust Fund
- 5.2 Others

Agenda 6: Cooperation with Donors, Non-Member Government and International/Regional Organizations

Agenda 7: Recommendations of the Thirty-third Meeting of the Program Committee

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

Agenda 8: Closing of the Meeting

Annex 4

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES
FOR THE YEAR 2010-2011**

SEAFDEC Departmental Programs for the Year 2010-2011 are listed below and proposed activities which detailed of their projects appears in *Appendix 1*, *Appendix 2* and *Appendix 3*.

Program Title	Responsible Department	2010	2011	
Center-wide Information Network	SEC	Y	Y	<i>Appendix 1</i>
Information and Communication Technology	TD	Y	Y	<i>Appendix 2</i>
Tailor-made Training and Study Tour	TD	Y	Y	
Integrated Mollusk Production	AQD	Y	Y	<i>Appendix 3</i>
Mud crab and Shrimp Domestication	AQD	Y	Y	
Marine Fish	AQD	Y	Y	
Small-holder Freshwater Aquaculture	AQD	Y	Y	
Seaweed Strain Improvement	AQD	Y	Y	
Aquatic Ecology	AQD	Y	Y	

**SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITY
FOR THE YEAR 2010-2011**

THE SECRETARIAT

For SEAFDEC Secretariat, only one Departmental Program on “Center-wide Information Network” was implemented in 2010, and proposed for 2011.

PROGRAM DOCUMENT

Program Category: Departmental Program
 Program Title: Center-wide Information Network
 Responsible Department: SEAFDEC Secretariat
 Total Duration: Since 1998

1. INTRODUCTION

Considering the vital role of information as a tool in the development and management of the 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 its 38th Meeting, the SEAFDEC Council endorsed the Information Strategies for Enhancing SEAFDEC Visibility and Communication which is envisaged to streamline information activities in a more cost-effective manner, and enhance visibility of the organization. Framework and activities under the Program therefore 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 Program aims to produce materials to promote activities and visibility of the Center, enhance communication among the SEAFDEC staff 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.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

Information-related activities undertaken by the Secretariat in collaboration with all SEAFDEC Departments during the year 2010 under the Center-wide Information Network framework are as follows:

Project/Activity Title	Duration	Remarks
Production and dissemination of reports of SEAFDEC annual meetings		
• Report of the 32 nd SEAFDEC Program Committee Meeting	Q1	100%
• Report of the 12 th ASEAN-SEAFDEC FCG Meeting	Q1	100%
• Report of the 42 nd SEAFDEC Council Meeting	Q1	100%

<p>Production and dissemination of Annual Report 2009 SEAFDEC Annual Report publishes highlighted activities and achievement of SEAFDEC during the annual working cycle. Number of production is 1,000 copies, distributed to Member Countries, Network Libraries, fisheries-related institutions/organizations, collaboration organizations, and interested people.</p>	Q1-2	100%
<p>Information Compilation CD-ROM 2009 During the 39th SEAFDEC Council Meeting in 2007, the Council requested that the information/technical materials published by SEAFDEC during the whole year period should be provided to the Member Countries for their information and usage. SEAFDEC since then has therefore annually prepared the CD-ROM containing the information/technical materials published by SEAFDEC and provide to the SEAFDEC Council during the SEAFDEC annual Council Meeting.</p>	Q1	100%
<p>Production and dissemination of Newsletter Volume 32 Number 4 and Volume 33 Number 1-3 SEAFDEC Newsletter publishes activities of SEAFDEC in promoting fisheries development in Southeast Asia, with inputs from all SEAFDEC Departments and Member Countries (if any). Current production is 1,600 copies, distributed to Member Countries, Network Libraries, fisheries-related institutions/organizations, collaboration organizations, and interested people. Newsletter is also available through SEAFDEC Integrated Website. In addition to the English version, approx 200 copies of Japanese version Newsletter were also produced for distribution in Japan.</p>	Q1, Q2, Q3, Q4	75% <i>(Volume 32 Number 3 is now under compilation process)</i>
<p>Production and dissemination of Special Publication “Fish for the People” Volume 8, Number 1-3 The Special Publication will be in easy reading style, targeting not only the technical people but also the non-technical including policy makers, young scientists and managers and others who are interested in the fisheries issues in ASEAN region. Currently, the number of production is 1,500 copies/issue. The Special Publication is available through SEAFDEC Integrated Website.</p>	Q2, Q3, Q4	80% <i>(Volume 8 Number 3 is now under compilation process)</i>
<p>Fishery Statistical Bulletin for the South China Sea Area</p> <ul style="list-style-type: none"> • Production and dissemination of Statistical Bulletin for 2007 • Production and dissemination of Statistical Bulletin for 2008 • Production and dissemination of Statistical Bulletin for 2009 	Q1 Q2-4 Q4	100% 90% 20%
<p>Maintaining and improving of the Website</p> <ul style="list-style-type: none"> • SEAFDEC Integrated Homepage (www.seafdec.org) • Portal Website for the ASEAN-SEAFDEC Strategic Partnership (http://www.asspfisheries.net) 	Q1-Q4	On-going On-going
<p>Other promotional activities</p> <ul style="list-style-type: none"> • SEAFDEC Information Catalogue 2010 • SEAFDEC Calendar 2010 	Q4 Q2-Q3	90% 100%
<p>Eleventh SEAFDEC Information Staff Exchange Program Meeting The 11th ISEP was organized from 6-8 October 2010 hosted by AQD. Main objectives of the 11th ISEP Meeting are: 1) To review the achievements and monitor the progress of implementation of SEAFDEC information activities, and the information Strategy for Enhancing SEAFDEC Visibility and Communication in 2009; 2) To discuss and conclude activities to be incorporated under the Center-wide Information Network Program framework in 2010; 3) To discuss the new initiatives to be implemented to enhance the SEAFDEC Information activities and visibility; and 4) To introduce initiatives in information aspects undertaken by AQD (as host department) and exchange views among SEAFDEC information officers.</p>	6-8 Oct	100%
<p>Regional Fisheries Policy Network (RFPN) In 2010, SEAFDEC Secretariat was stationed by Regional Fisheries Policy Network (RFPN) comprises members from Indonesia, Malaysia, Myanmar, Philippines, and Thailand (with support from Sida). The main roles of the RFPN are to promote the formulation of regional fisheries policies and recommendations on the important regional fisheries-related issues. The RFPN also assist in coordination with Member Countries, and to promote closer collaboration between SEAFDEC and Member Countries.</p>	Q1-Q4	On-going

Information-related Activities for the ASEAN-SEAFDEC Conference 2011 The promotional activities, as well as information materials/tools were developed in order to promote the ASEAN-SEAFDEC Conference to public. These include the establishment of the Conference Website, the preparation of the Conference 1 st and 2 nd Announcement, the conduct of 1 st and 2 nd Press Conference, and the production of other relevant materials for the Conference.	Q1-Q4	On-going
SEAFDEC Introductory Video SEAFDEC introductory video was prepared to promote SEAFDEC as a whole and facilitate the presentation of the SEAFDEC organization for visitors or dissemination during certain events as appropriate.	Q1-Q4	100%

4. PROPOSED ACTIVITIES FOR THE YEAR 2011

The Information activities proposed to be undertaken in the year 2011 are:

	Remarks
1. Production of SEAFDEC Annual Report 2010	1,000 copies
2. Information Compilation CD-ROM 2010	50 copies
3. Production of SEAFDEC Newsletter Vol. 33 No.4, Volume 34 No.1-3	1,600 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. 9 No. 1-3	1,500 copies
6. Developing and maintaining Websites <ul style="list-style-type: none"> • SEAFDEC Integrated Homepage • ASSP Portal Website 	(web-based)
7. Production of SEAFDEC Calendar 2012	3,000 copies
8. Compilation and Production of Fishery Statistical Bulletin 2009 and 2010	400 copies each
9. Twelfth SEAFDEC Information Staff Exchange Program (ISEP) Meeting	
10. Production of other promotional materials <i>e.g.</i> brochures, posters, etc.	
11. Regional Fisheries Policy Network (RFPN)	With Support from Sida and JTF
12. Information activities and promotional materials for publicizing the ASEAN-SEAFDEC Conference 2011	

In addition, based on the discussion and recommendation at the 11th Meeting of the SEAFDEC Information Staff Exchange Program, additional activities would also be explored and may be accommodated under the Program on Center-wide Information Network, based on availability of budget.

Tentative Timeframe

Activity	J	F	M	A	M	J	J	A	S	O	N	D
1. Annual Report 2010												
2. Information Compilation CD-ROM 2010												
3. Newsletter (4 issues)												
4. 33 rd PCM Report												
5. 13 th FCG Report												
6. 43 rd Council Meeting Report												
7. Special Publication (3 issues)												
8. Developing and maintaining Websites												
9. SEAFDEC Calendar 2012												
10. Statistical Bulletin 2009 and 2010												
11. 12 th ISEP Meeting												
12. Other promotional materials/activities	Based on events/requirement											
13. Enhancing coordination through Regional Fisheries Policy Network	With Support from Sida and JTF											
14. Activities for Publicizing the ASEAN-SEAFDEC Conference 2011												

Appendix 2 of Annex 4

**SEAFDEC DEPARTMENTAL PROGRAM OF ACTIVITY
FOR THE YEAR 2010-2011**

TRAINING DEPARTMENT

1. OVERALL REVIEW

In the year 2010, the project on Information and Communication Technology and Tailor-made Training and Study Tour Program were implemented by TD. The activities of these projects were promoted to enhance TD and organization visibility to worldwide and established new network for collaboration in the future.

In the year 2011, TD continues to implement a program related to Information and Communication Technology under the Departmental program. However, some program activities will continue and some of them will be adjusted and modified. Under the program, the public relation to promote TD activities will still be emphasized and implemented. TD online, E-learning for pre-training course will be designed and implemented on TD webpage. TD will produce an electronic newsletter to disseminate the progress of TD activities and Advance Fisheries Technology Magazine to organization network and members. The production of Multimedia Packages to support TD projects and activities including serving other departments and SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 will be produced. Moreover, the tailor-made training courses and study tour programs will be also conducted in the year 2011, 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.

2. LIST OF PROGRAMS/ACTIVITIES

1. Information and Communication Technology
 - Enhancement of TD and SEAFDEC Visibility
 - Information and Communication Development
 - Development and Production Multimedia Packages
 - Collaboration between SEAFDEC and other international organizations
2. Tailor-made Training and Study Tour Program
 - University Student training course
 - Other tailor-made training and study tour programs

PROGRAM DOCUMENT

Program Category: Departmental Program
Program Title: Information and Communication Technology
Responsible Department: Training Department
Total Duration: 1 year (January-December 2011)

1. INTRODUCTION

Presently, Information Technology (IT) is essential for communication inside and outside the organization and worldwide. IT has been developed as a high technology to support the implementation of activities in the organization. Information and Communication Technology as information service, the Internet and multimedia in Training Department have to be developed and improved to support SEAFDEC and Training Department activities. Moreover, it is the channel to promote SEAFDEC Visibility to worldwide.

2. PROGRAM

2.1 Objectives:

- 1) To promote role of TD and organization to worldwide
- 2) To manage and develop TD's information communication technology
- 3) To utilize and apply new technology for the Department
- 4) To establish network and collaborate with other related institutes/organizations

2.2 Program Description:

In 2011, The Department will develop and carry out information activities such as compiling, designing, producing, disseminating, acquiring and exchanging of printed and non-printed information. Various databases and information files will be designed and compiled to serve as effective tools. The Department's website will be updated in time to present its activities worldwide. Moreover, SEAFDEC Public Relations will be emphasized and promoted via every channel to serve for the department's strategy of enhancing the organization's visibility worldwide.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

In 2010, the Training Department continued to implement a project on Information and Communications Technology under the Departmental Program. The following activities were implemented:

3.1 Public Relations

To enhance SEAFDEC visibility, TD organized 13 exhibitions and display of TD activities to present and promote SEAFDEC roles in sustainable fisheries development in the ASEAN region. An audiences of more than 55,600 visited TD booth. Moreover, two volumes of Advance Fisheries Technology Magazine and TD souvenirs such as key chains, bookmarks, T-shirts and polo-shirts were produced and distributed to the public and worldwide. An article focusing on fisheries was also written and appeared in the column titled "Open fishery in the world" of local newspaper every month.

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.

3.2 Information and Communication Technology Development

The information database, data links, news and activities/events on TD website were updated in time. TD in collaboration with World Small-scale Fisheries Congress designed and created WSFC website and integrated this website to TD website at www.seafdec.or.th/wsfc2010. Moreover, electronic newsletters and Advance Fisheries Technology were produced and distributed to TD network and worldwide.

3.3 Development and Production Multimedia Packages

Seven VCDs on training courses, TD project implementation and meetings were produced to promote TD organization and activities. CD-ROM on TD implementation 2009 was also produced in January 2010 and distributed to promote TD project implementation activities to Member Countries and worldwide. Moreover, TD in collaboration with the Secretariat and other Departments produced VCD on SEAFDEC organization for promoting SEAFDEC visibility. Nineteen publications and reports were printed and served as new information to develop capacity of those who are engaged in the fisheries field. They were distributed in all occasions to share and exchange information among fisheries related organizations and through networks.

3.4 Collaboration between SEAFDEC and Other International Organizations

TD organized 2nd Regional Technical Workshop on Safety at Sea for Small Fishing Boats (20-23 April 2010). This RTC was attended by international organizations/institutions, namely, BOBP, SPC, TUMSAT, NFU, KU and etc. to share information among them. Moreover, in collaboration with FAO/GEF, the Department organized FAO/GEF Regional Workshop on Strategies for Fisheries By-catch Management from 4 to 7 May 2010

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1) Enhancement of TD and SEAFDEC visibility		
• Exhibition	Jan-Dec 11	
• Public Relations of TD and SEAFDEC via newspaper, other fisheries website, etc.	Jan-Dec 11	
• Promotion of Fish for the People 2020 Conference	Jan-Jun 11	
• Production of souvenirs for Fish for the People 2020 Conference	Jan-Jun 11	
2) Information and Communication Technology Development		
• Creation of TD activities database such as details of training courses, meetings and lists of participants.	Jan-Dec 11	
• TD E-book on website	Jan-Dec 11	
• Development Fish for the People 2020 Conference website in collaboration with SEAFDEC/Secretariat	Jan-Dec 11	
3) Development and Production of Multimedia Packages		
• Production of VCD on TD activities such as training courses, project implementation, etc.	Jan-Dec 11	
• Production of short spot advertisement to promote SEAFDEC for the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020	Jan-Jun 11	
4) Collaboration between SEAFDEC and other international organizations		
• Establishment of TD network with other international organization and institutions	Jan-Dec 11	
• Collaboration with FAO/UNEP/GEF in the implementation of REBYC II project	Jan-Dec 11	

4.2 Expected Outcomes

- Roles of TD and SEAFDEC will be well known to the public.
- Information Communication Technology in TD will be developed and used to promote TD projects and support working in TD to enhance TD and SEAFDEC's visibility
- Collaboration between TD and other international organizations in information exchange and information technology such as website linkage and project implementation will be promoted.

PROGRAM DOCUMENT

Program Category: Departmental Program
Program Title: Tailor-made Training Courses and Study Tours
Responsible Department: Training Department
Total Duration: 1 year (January-December 2011)

1. INTRODUCTION

It is well recognized that, if organizations are to survive and prosper in the modern world of rapid change, they need to be more flexible, faster-moving and faster-learning than before. It rests upon the abilities of their workforce. If individuals are able to learn, develop and change themselves, then so can organizations. Providing good training for staff not only helps them develop their skills and knowledge, but also build the body who has a motivation working for their organization's success.

In each year TD has conducted several regional training courses that serve as channels to transfer activities outcomes and technology which are found out or developed by SEAFDEC to its Member Countries through participants in those courses. In recent years, SEAFDEC/TD has been requested to conduct some courses and study tour programs that are direct follow-up of its advisory activities for organizations in this region. Such courses/programs are referred to as tailor-made courses/programs because they are set up at the request and need of recipient organizations. In order to design a course, participants' backgrounds, work responsibilities and expectations for outcomes at the end of the course should be taken into consideration. Therefore, through the courses those organizations can get an enormous benefit in developing the capabilities of their workforce since they can have a right type/design of training for their right people at the right time.

The tailor-made training courses and study tour programs conducted by TD emphasize learning through doing and observing by participants themselves. This is an approach that relies heavily on the participants' active involvement. The course will not focus on the theory but on more dealing with practical application.

2. PROGRAM

2.1 Objectives

- 1) To provide a wide range of tailor-made training courses and study tour programs in the field of fisheries and other relevant aspects at the national and international levels
- 2) To fully utilize training facilities of the TD for the Member Countries and the region
- 3) To raise funding support from other donors/organizations

2.2 Program Description

The tailor-made training courses and study tour programs will be conducted based on the needs and requirements from recipients of them. Then TD will formulate programs after discussion between the Department and recipients on the choice of subjects, duration, location, and a target group. Courses/programs can be constructed by combining with existing training programs or might be developed as totally new topic.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

In the year 2010, there were 12 tailor-made training courses, study tour programs and practical training programs were conducted by TD. The total number of participants who have completed their courses is 242 (including those who are going to complete) in the year of 2010. The tailor-

made programs are summaries as follows:

- **Short-term training program on Marine Fisheries Resource Surveys, Stock Assessment and Co-management:** The training program was successfully conducted from 8th to 19th February 2010 for fifteen (15) participants from NARA and the Department of Fisheries in Sri-Lanka. The course was focused upon a new concept and approaches in dealing with fisheries community for coastal fisheries management, the collection and processing of fish catch & effort data, fisheries statistics and socio-economic information relevant to and necessary for fisheries management. The program will also focus on tools and techniques for collecting information about and from stakeholders as well as the analysis and evaluation of the information. The course was comprised of presentation/discussion, practice and visits to related places.
- **Short-term training Course for Young Generation in Fisheries Resource Conservation:** The course was conducted under the collaboration with the Department of Fisheries, Thailand, from 28-30 June 2010. The course focused on the awareness raising and the understanding on the natural environment and fisheries resource conservation. It consisted of lectures, practical sessions, presentations and visits to the related places. It was attended by about 100 primary school students.
- **Short-term training program on Coastal Fisheries Management and Extension Methodology:** The course was conducted for three (3) participants from the Ministry of Fisheries and Marine Resources in Sierra Leone from 6-23 September 2010. The program focused on modern principles and concepts of coastal fisheries and resources management; needs for change of fisheries management towards co-management by involving local communities and applying ecosystem principles to fisheries management; small-scale fishery problems and constraints; facilitation, mediation and conflicts resolution skills; extension concepts, methodologies and implementation; study/field trips to fishing villages and coastal fisheries management pilot projects; practical involvement and presentation of extension media. The training program was comprised of presentations, discussion, practice and site visits in related places.
- **Short-term training Course for university students.** Training courses of this title were held twice at SEAFDEC/TD, from 15-26 March 2010 (Batch-49) and 18-29 October, 2010 (Batch-50), respectively. The course focused on the awareness raising and the understanding on sustainable coastal fisheries management for young university students as new generation. It consisted of the presentation/discussion sessions and the shipboard training. It had 40 and 46 participants, respectively.
- **Training Course on the Promotion Concept and Methods for the Participation of Communities in Coastal Fisheries Management** (In Thai version). The course was divided into two phases.
 - Phase I was targeted to extension officers from the Department of Fisheries (especially the persons who are working on the community-based coastal fisheries management projects). The course was conducted from 27 September to 6 October 2010. It aimed to familiarize participants with the concept, approaches, methods and techniques to get the involvement of communities, strengthen their application ability and encourage them to set-up the community network for the coastal fisheries management. The course had 25 participants. Its program was comprised of presentations, discussion, practices and site visits to related places.
 - Phase II was follow-up activities for the course participants. A one-day onsite training workshop was conducted mainly by the Phase-I course participants. The activity aimed to strengthen the community involvement and network for coastal fisheries management

and to evaluate the Phase-I course participants' knowledge and skill to be used and applied to their project work. Three project sites were selected to follow up these matters (The selection was done during the phase I training program). The program was carried out in November 2010.

- **Training course on fishing vessels operation for Pramong Tinasulanon Collage:** This tailor-made training course was designed for students from a fisheries collage. It aimed to produce capable seamen and navigators for the fisheries industry or other related sectors both at the national and international levels. The course was conducted from 4 October 2010 – 25 February 2011. 20 students attended this training course for this batch.
- **Practical training courses/On-the-job training.** Five different training courses were designed and conducted for University students in this year. The details are as follows:

Course titles/areas	Name of University	Period	Number of participants
Practical training course on oceanographic research and survey	Rajamangala University of Technology Srivijaya, Trang Campus	12 March-14 May 2010	3
Practical training on international training courses implementation and extension work	Thai Chamber of Commerce University	1 April-30 June 2010	1
Practical training course on oceanographic research and survey	Maejo University	15 March-12 May 2010	2
Practical training course on oceanographic research and survey	King Mongkut's Institute of Technology Ladkrabang Chumporn Campus	15 March-30 April 2010	3
Practical training course on oceanographic research & survey and coastal resource management	Walailak University	1 September-22 December 2010	2

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

At least five tailor-made training courses and study tour programs will be conducted in the year 2011

4.1 Planning of Project Activities

Project/Activity Title	Duration	Remarks
1. University student training course 2011 - University student training course' 51 - University student training course' 52	12 days each	
2. Other tailor-made training courses and study tour programs	(It will be designed based on course activities)	

4.2 Expected Outcomes

At least five tailor-made training courses and/or study tour programs will be conducted by TD in the year 2011. The aim of those courses is that 70% of participants in each course will meet their course expectation and the course objectives.

SEAFDEC DEPARTMENTAL PROGRAMS OF ACTIVITIES FOR THE YEAR 2010-2011

AQUACULTURE DEPARTMENT

1. OVERALL REVIEW

The accomplishments of SEAFDEC/AQD during the period covered by this report are based on strategic thrusts which overall, are expected to assist the SEAFDEC Member Countries in addressing issues related to aquaculture development and its contribution to food security.

The strategic thrusts which best describe the Research and Development agenda of AQD center on: i) development of science-based aquaculture technologies; ii) verification, demonstration and transfer of aquaculture technologies appropriate to the Asian region; and iii) building the capacities of the aquaculture sector in the region.

Under strategic thrust one, AQD focuses on six Departmental Programs and four Regional Programs. The Departmental Programs are on the following areas: a) Integrated Mollusk Production; b) Mud crab and Shrimp Production; c) Marine Fish Production; d) Small-holder Freshwater Aquaculture; e) Seaweed Strain Improvement; and f) Aquatic Ecology. Activities in these Programs involve research and verification of aquaculture technologies in the priority areas of broodstock development and seed production, farming systems and ecology, nutrition and feed development, fish health management, and socio-economics.

This report presents the highlights of activities and accomplishments of AQD Departmental Programs in 2010 (January to September).

a. Mollusk Program

The program's focus is on donkey's ear abalone, *Haliotis asinina* and is aimed at addressing the following specific objectives: i) produce seed stocks for stock enhancement and abalone grow-out aquaculture; ii) create science-based technologies that are economically-viable and appropriate to the region; iii) demonstrate developed technologies for seed production and culture; and iv) disseminate the information on SEAFDEC/AQD developed technologies. The activities undertaken by the Program in pursuit of these objectives are discussed below:

The hatchery and transport techniques for the donkey's ear abalone were further refined. Larval transport experiment (with shaking) indicated that percent survival was significantly affected by the combined effects of loading density and transport time. Lower survival was observed after 24 hours at 150 individuals/pipe which might be due to higher ammonia levels at higher loading density.

In another experiment, breeders collected from Masbate had produced two batches of F₁ cohorts. Percent settlement, survival, and growth were comparable between cohorts from breeders newly collected from the wild (Masbate) and cohorts from hatchery bred broodstock.

The associated bacterial population/diversity and algal community structure in biofilms of settlement plates for larvae were examined and documented using standard techniques as well as electron microscopy.

The slow growth of abalone during grow-out rearing is another constraint that is being addressed by the Program. Hence, experiments were initiated to develop the microparticulate diets

containing varied protein and energy levels and evaluate the effects on post-larval settlement and metamorphosis.

As part of the initiative to develop the maturation diet for abalone, the lipid and essential fatty acids requirement of abalone were determined. The effects of dietary protein/energy levels on abalone maturation and reproduction are also being evaluated.

Strains of two species of diatoms (*Cocconeis* sp. and *Nitzschia* sp.) that are naturally present in abalone settlement plates that could potentially improve the settlement and growth rates of post-larvae during the hatchery phase were isolated. The culture requirements (light intensities and enrichment media) for mass production were tested. Experiments were also conducted to optimize the conditions for the mass culture of the fungus, *Traustochytrids* using commercial glucose and cane molasses. The *Traustochytrids* is one of the potential sources of fatty acids that could enhance the diet of abalone juveniles, as well as other aquaculture species.

To further improve the production of abalone, experiments were initiated to develop the recirculating system for the intermediate nursery rearing and broodstock maintenance of donkey's ear abalone. Highest average body weight and length were obtained in artificial diet fed abalone in recirculating system and lowest, in *Gracilaria*-fed abalone in recirculating system.

To improve the production of abalone juveniles, the nursery rearing and culture of tropical abalone in plastic trays at different sites were continued. About 48,000 pieces of abalone juveniles are currently being reared in the nursery.

As part of the strategy to improve stocks and enhance its market potentials, experimental trials on hybridization of Philippine native abalone species were continued. The parental HAFPM hybrid (*H. asinina* female x *H. planata* male) and HAFGM hybrid (*H. asinina* female x *H. glabra* male) had produced 9,043 and 6,998 juveniles, respectively. The performance of hybrids and pure *asinina* was compared in terms of growth (shell length and body weight) and tolerance to stress/salinity.

The Program has continued to demonstrate the large-scale production of donkey's ear abalone juveniles. The Program produced a total of 203,490 pieces abalone juveniles (shell length: 5mm-8mm; survival rate: 31.68% - 53.20 %) from January to September 2010.

Two verification experiments on the effects of photo-period were also conducted. To minimize inbreeding, crossing of wild females with hatchery bred males is in-progress.

b. Mud Crab and Shrimps

The program aims to develop techniques for sustainable production of good quality broodstock and seed of indigenous species of shrimp and mud crab. Studies are conducted towards selective breeding of target species to address this goal. As a prerequisite to selective breeding programs, domestication is initially pursued through monitoring of the genetic structure of base populations, establishing husbandry techniques, developing suitable diets for the different life stages, and culture of live food necessary for good reproductive performance. Stock assessment and socio-economics of each culture phase are included to evaluate impacts of adoption of generated technologies. The progress of activities is discussed below:

Shrimps

Penaeus indicus broodstocks were fed diets containing marine annelid meal at levels of 10% and 20% of the basal diet, with or without live annelids. Spawnings were observed but only 50% of the spawnings produced nauplii. F₁ stocks resulting from reciprocal matings among Antique,

Tigbauan and Negros stocks were obtained and are being grown in tanks. Initial selection for the bigger-sized stocks was done for two of the families.

Evaluation of the performance of wild and pond-sourced *Penaeus monodon* fed natural and artificial diet was continued. Wild sourced *P. monodon* broodstocks fed the all natural diet consisting of the fresh and frozen polychaetes had significantly lower spawning rates and lesser efficiency in stimulating ovarian development than those fed the artificial diet. The higher nutrient composition in the artificial diet could be a factor for the effective reproductive performance of the broodstock fed this diet.

The study that is aimed to evaluate the marine annelid as a lipid source and as a substitute for high value marine protein sources in feeds for growth of *P. indicus* and *Scylla serrata* was also continued. Marine annelids were cultured and sampled to assess the morphological and histological structures, reproduction potential and nutrient content. In another experiment, results showed that at 3% level of incorporation in the diet, seaworm meal, squid meal and their 1:1 combination promoted higher growth in white shrimp and mud crab.

An experiment was also initiated to evaluate the polyculture of *P. monodon* and *Siganus guttatus* in a biosecured environment friendly pond culture system. However, stocks were harvested ahead of schedule since these were found to be positive for WSSV.

Mud Crab

Concerning the mud crab, studies were continued to domesticate, refine the broodstock management, seed production, and culture techniques during the nursery and grow-out phases at different production systems.

Antibiotics were applied during crab larval rearing to determine the effects on growth, survival and morphology of crabs. The percentage occurrence of abnormalities increased with the increasing concentration of antibiotics. Different diets were also tested in the larval stage of crab to determine the effects in terms of reducing the molt death syndrome at Zoea stage. Those fed formulated diet alone were not able to molt to the megalopa stage. It was also found that survival was higher in larvae fed *Artemia* with enrichment (3% DHA protein SELCO).

Experiments were also continued to evaluate the effects of dietary tryptophan (TRP) on the antagonistic behaviour of mud crabs. Tryptophan supplemented through the diet (1%) reduced the aggressive behavior in crabs, suggesting that this may help reduce cannibalism.

The effects of exogenous serotonin on the antagonistic behavior of dominant mud crab and on shelter competition of juveniles were also investigated. Mean frequency and intensity of attacks by dominant mud crabs decreased significantly after serotonin injection. During the day, bigger mud crabs injected with crab saline occupied the shelter more often than mud crabs injected with serotonin. It was also observed that shelter occupancy was not that important in the evening due to their active nocturnal feeding.

The nursery production of mud crab in net cages installed in brackishwater ponds was also continued. Five experimental runs were conducted with survival rates of more than 50%, except for one run which had a low survival of 35%.

Efforts were continued in terms of development of practical feed for the grow-out culture of mud crabs. The effects of AQD formulated diets in terms of production performance of mud crabs reared in brackishwater ponds with milkfish (*Chanos chanos*) and siganid (*S. guttatus*) were assessed. Results show that co-culture of mud crabs with siganids may not be feasible. Refinement of mud crab and milkfish polyculture protocols will be pursued.

Fattening of wild-caught mud crabs in the mangrove using individual bamboo pens and fed with trash fish or mussels was done. The crabs were of mixed species: 52.8% were *S. olivacea*, 13% *S. serrata* and 34.2% were *S. tranquebarica*.

c. Marine Fish

The Program aims to refine broodstock management, seed production, and grow-out technologies for marine fishes and promote these for livelihood in the coastal areas. Marine fishes such as milkfish, grouper, sea bass, mangrove red snapper, rabbit fish, pompano, black-spotted scat, Napoleon wrasse, hybrid red tilapia, and seahorse are the species being studied. The accomplishments under various stages of culture of marine fish are discussed below:

Broodstock Development, Hatchery and Seed Production

Studies were continued to improve the reproductive performance and seed production techniques for some commercially important marine species. AQD initiated evaluating the effects of dietary vitamin C on reproduction, egg and larval quality and immune responses in grouper *Epinephelus fuscoguttatu*. In milkfish broodstock, the fortification of the diet with vitamins and lipids improved the spawning frequency, egg production and fertilization rate. With regard to high value marine fish, the intervention used to improve the seed production largely utilizing formulated diet with lesser dependence on brine shrimp and minced trash.

Potential substitutes for brine shrimp and for trash fish were also continued to be explored, tested and mass produced. In 2010 a laboratory scale of an air lift culture system was developed and adapted for the intensive culture of mysids, a good live food substitute for *Artemia* in grouper larval culture.

Experiments were also started to develop the breeding and seed production techniques for other emerging species which include the Pompano, Black-spotted scat (*Scatophagus argus*), and Napoleon Wrasse *Cheilinus undulates*. The experiments in 2010 focused on determining the optimum dosage of LHRH/HCG for induced spawning and optimum conditions for larval rearing.

The development of simple and rapid diagnostic assays for egg quality assessment of marine fish was continued. Previous finding of AQD indicated that insulin-like growth factor II (IGF-II) mRNA expression could be used as potential indicator of egg quality in grouper. In 2010, efforts were focused on standardization of the technique using real time-polymerase chain reaction (RT-PCR).

Nursery, Grow-out and Other Studies

Studies were continued to demonstrate the viable technology for fingerling production of sea bass, *Lates calcarifer*, mangrove red snapper, *Lutjanus argentimaculatus* and siganid *S. guttatus* fingerlings in ponds.

Snapper fingerlings stocked in brackishwater ponds and given commercial diet containing 46-48% protein attained average body weights that ranged from 48-60 g (FCR-1.3) after 150 days of culture. With regard to siganids, stocks fed filamentous algae for the first 45 days after which they were given formulated diet of 32-39 % protein, attained average body weight of 27 g after 60 days of culture.

Various verification studies done in freshwater, brackishwater and marine environments were again conducted and these continued to show that SEAFDEC diets were consistently comparable if not better than the commercial diet. Evaluation in the freshwater environment also showed that SEAFDEC formulated resulted in better growth performance of sea bass grown in floating cages in lake (Lake Vito, Dingle, and Iloilo).

In the grow-out experiment conducted in floating net cages, Pompano stocks were fed milkfish commercial feed, commercial milkfish feed + commercial pompano feed or commercial pompano feed. At last sampling, those fed commercial pompano feed had highest average body weight (536 g) while lowest, in stocks fed milkfish commercial feed.

The intensive production of red tilapia hybrid in polyculture with siganid in brackish water ponds was assessed. Separate experiments were also done to verify and refine the techniques for the semi-intensive production of rabbitfish and snapper fed SEAFDEC diet in ponds and the combined intensive culture of milkfish and mud crab (*Scylla* spp.) in ponds.

Various studies were continued to find alternatives to fish meal in aquaculture feed. The optimum level of soy protein concentrate (SPC) inclusion in diets containing fish meal and soybean meal was tested. Fish fed diets containing SPC at 30% gave optimum growth. In another experiment, meat and bone meal was also tried as an alternative protein source to fish meal for milkfish reared in seawater or freshwater. After 30 days, survival of juveniles in freshwater was 100% and weight gain ranged from 95-179%. The third experiment that looked at the effects of feeding frequency using grouper diet with cowpea was also initiated. Results indicated that feeding once a day is appropriate for groupers.

Experiments were also conducted to further improve the nutritional value of locally available feed resources for practical aquatic feeds by fermentation using milkfish gut bacteria and/or selected fungi. Fermentation experiments with ipil-ipil leaf meal for diet formulation of milkfish are on-going.

With regard to seahorse (*Hippocampus barbouri*), various diet types have been tried but so far none has been acceptable to adult seahorses. The study is still on-going.

Another study initiated was the characterization of innate immune response of grouper, *Epinephelus coioides* to *Vibrio* sp. The bioenergetic aspect of early development in grouper was also investigated. During the transition from endogenous to exogenous feeding, larvae at the mixed feeding period showed the highest oxygen consumption compared with those at the endogenous and exogenous feeding periods.

d. Small-holder Freshwater Aquaculture

The program focuses on development of optimal breeding, seed production and grow-out culture strategies for regionally important freshwater commodities such as the giant freshwater prawn, Asiatic carps, tilapia, catfish and indigenous freshwater fish species. The program also promotes the implementation of effective health management strategies for all the farmed species for their sustainable production.

Genetically enhance giant freshwater prawn for improved production traits

A GOJ-TF study on the development of effective broodstock management schemes to improve growth and reproductive performance in the giant freshwater prawn. Stocks of giant freshwater prawn *Macrobrachium rosenbergii* designated as Old Calumpit (OC F₅ generation) and New Calumpit (NC F₁ generation) were assessed in terms of reproductive efficiency. Stock comparison experiments on growth were also conducted in lake and tank-based cages, using progenies from the two stocks – OC and NC.

Develop techniques for improved seed production and lake-based cage culture of genetically enhanced freshwater prawn

Seed production methods for the commercial *M.* species (*M. rosenbergii dacqueti*) have been refined to suit Philippine conditions. Reliable mass production techniques for freshwater prawn

post-larvae using greenwater system are already established. Seedstock produced are made available to local prawn growers.

A new study on the development of diets for giant freshwater prawn post-larvae and juveniles was recently started. Four formulated prawn diets to be evaluated involve the partial replacement of fish meal with cowpea meal at varying levels (0, 15, 30 and 45%). Another new study initiated would evaluate the production characteristics of the giant freshwater prawn reared in cages using different grow-out management strategies.

Promote adoption of improved techniques for broodstock management, hatchery and nursery rearing of bighead carp

Another lake-based run for the technology verification study on the production of advanced bighead carp fingerlings is ongoing.

Improve and promote production technology for tilapia

A grow-out trial under the ACIAR-funded study was conducted in Laguna de Bay to evaluate the growth and survival of Nile tilapia under low feeding rates with daily and skip feeding. No significant differences in growth and survival of Nile tilapia were observed between the two treatments.

Preliminary comparison of performance (growth, survival and fillet yield) of different tilapia lines was conducted. Nile tilapia was found to have better meristic traits than the red tilapia and the Mozambique tilapia stocks. The Mozambique tilapia, the most saline tolerant of the three species, had the highest survival (100%) in brackishwater.

In the Tigbauan Main Station, Nile tilapia and red tilapia seedstock are being produced continuously. A growth experiment on tilapias in cages in a freshwater reservoir in Dingle, Iloilo fed a SEAFDEC and a commercial diet was also continued. Polyculture of tilapia and freshwater prawn in cages which has been set up in the same freshwater reservoir in Dingle are currently underway.

Verify and demonstrate technology for culture of native catfish in lake-based cages and ponds

A second verification run on the grow-out culture of the native catfish *Clarias macrocephalus* in lake-based net cages is also being undertaken.

Develop culture techniques for indigenous freshwater species in the region

Studies on the freshwater indigenous species silver therapon were continued. The reproductive biology of silver therapon *Leiopotherapon plumbeus* found in several freshwater habitats in Luzon was investigated. Induced spawning trials were also made.

To support the need for growing silver therapon hatchlings, two candidate larval food species (*i.e.* protozoan and small algal species) are being cultured to evaluate their potential as food for first feeding larvae of silver perch. Those grown in lake-based net cages had similar mean body weights when fed trash shrimp feed or commercial prawn feed. Growth was higher for both treatments than the unfed control.

Implement health management strategies for culture of freshwater species

Another study started is on the identification and control of freshwater and marine fungi affecting *Macrobrachium* spp. broodstock and larvae. Fungi isolated from incubating eggs and infected

larvae of *M. rosenbergii* were characterized and identified based on their morphological attributes. Three of four isolates have characteristics that classify them under genus *Lagenidium*.

Other studies

A new study being co-funded by ACIAR has recently commenced and this shall focus on the carrying capacity, decision support tools for freshwater systems in Australia and the Philippines. Results generated from this research will be beneficial particularly for setting policies in the sustainable management of freshwater systems (like the Laguna Lake) which are used for aquaculture.

e. Aquatic Ecology

The Program aims to generate aquaculture technologies with the least possible negative impact on the environment. The Program focuses on assessing the impacts of aquaculture on the environment, including different pond practices on biodiversity in ponds and adjoining mangroves and shores, and developing bioremediation measures to mitigate negative impacts of aquaculture to the environment. The progress is discussed below:

Assess the impacts of aquaculture on the environment

Preliminary experiments on *Anodontia philippiana* and *Holothuria scabra* as bioremediators in an intensive cage culture system showed that sulfide is higher beneath the cages than in the control area without cage. The control (an open area where oxygen is not limiting) was found to have significantly lower ammonia, phosphate and sulfide concentrations as compared to the four milkfish cages. An *in situ* experiment was also conducted to determine the sulfide tolerance of sea cucumber.

Assess the impacts of different pond practices on biodiversity in ponds and adjoining mangroves and shores

Ponds used in various technology verification projects at Dumangas Brackishwater Station (DBS) were totally drained and by-catch (non-crop) species were obtained for identification. Results showed a very high diversity of non-crop species (fishes, crustaceans, mollusks, echinoderms), mostly naturally seeded by the tides. Chlorinated ponds had much lower diversity and volume of non-crop species.

Develop bioremediation measures to mitigate negative impacts of aquaculture to the environment

A study was initiated to determine the optimal conditions (including substrate preference) for growth and survival of the sandfish (*Holothuria scabra*) juveniles. Separate experiments were also conducted to test the suitability of different species for combined culture with sandfish. The species tested were the mangrove snapper (*L. argentimaculatus*), the shrimps, *P. indicus* and *P. monodon*.

A study that determines the social acceptability of marine cage culture as a livelihood option for fishers affected by oil spill in four coastal barangays in Nueva Valencia, Guimaras was continued.

f. Seaweed

The Program is being carried out with the following objectives: i) develop 'new' and improved varieties of *Kappaphycus* through tissue culture, sporulation, and protoplast fusion techniques; ii) improve the efficiency of *Gracilaria* (other seaweeds) as biofilter; and iii) explore the microbial

properties of commercially important seaweeds against common fish (and humans) pathogens. The progress in pursuit of these objectives is outlined below:

Develop ‘new’ and improved varieties of Kappaphycus

Seaweeds from spores were grown in the farm and being evaluated for its growth performance. Temperature highly affected the density of protoplast isolated. No protoplast was isolated when tissues were incubated below 26°C. Extraction of *Kappaphycus* DNA was optimized.

Improve the efficiency of Gracilaria and other seaweeds as biofilter

To determine the potential of *P. indicus* - *Caulerpa racemosa* polyculture in pond, salinity tolerance test was conducted. *C. racemosa* can withstand salinities as low as 20 ppt. Results also showed that *P. indicus* juvenile stocked in tanks containing 6 kg ton⁻¹ *C. racemosa* can be maintained without water change for 23 days. The optimum stocking density of the seaweed *C. racemosa* for production in tank under semi-outdoor conditions was also determined.

Explore the microbial properties of commercially important seaweeds against common fish (and humans) pathogens

The experiment to test the microbial properties of seaweeds against common fish pathogens was initiated. Available *Kappaphycus* and *Eucheuma* at the seaweeds laboratory were used in this study. Cellular materials were extracted and the antimicrobial properties of the extracts will be tested in viruses propagated in cell-lines as well as bacterial cultures.

g. Other R&D Activities

Institutional Capacity Development on Sustainable Aquaculture (ICDSA)

The ICDSA which is being implemented in partnerships with the local government unit, donor communities, fisherfolks/farmers and other stakeholder groups provides a mechanism for the assessment of socio-economic and environmental impacts of AQD aquaculture technologies and, for building the capacity of beneficiary communities.

In January 2010, the project conducted a mini-workshop and this resulted in the review, consolidation and integration of the information and lessons learned in the various ICDSA projects. It also prepared R&D templates and Road Map to the attainment of the Project Goals. Other accomplishments during the period covered by this report include the following: i) site assessments in Romblon, Dinagat Island and Surigao City and submission of corresponding reports to potential ICDSA clients; ii) establishment of trilateral agreement (Taytay sa Kauswagan, Petron Foundation and SEAFDEC/AQD) on the “Organizational and Entrepreneurial Development” of participating fisherfolk organizations from four villages in Nueva Valencia in support of the “Milkfish cage culture livelihood Project”; iii) publication of a Manual entitled “Mud crab nursery in ponds”; and iv) presentation of related ICDSA papers in various national and foreign fora.

ABOT AquaNegosyo

The ABOT (agree-build-operate-transfer) AquaNegosyo (aquaculture business) Program aims to disseminate science-based aquaculture technologies to encourage private sector investments in aquafarming for livelihood generation and food security. Technology packages are promoted to potential local and international business investors through the provision of technical assistance in every phase of on-farm operations, from site selection to fish stocking, feeding, water and health management, monitoring, harvesting and post production.

From the time of its inception in 2007 to date, there have been 23 clients (private entrepreneurs, commercial farmers from the Philippines) who availed of the program. In 2010 (January to September) the ABOT AquaNegosyo Program served five local clients on different activities/projects. To better implement the program and serve aquaculture investors, changes in the coordination and implementation of the program were made. Apart from several local inquiries, project proposals have been submitted in response to queries from potential foreign clients from Madagascar for a mud crab project and Mauritius for a multi-species marine fish hatchery and grow-out project.

Training and Information

As of September 2010, AQD conducted 14 formal training programs on various aspects of aquaculture and has trained 156 participants, mainly government workers, private sector practitioners, fisherfolk and farmer communities from the Philippines and representatives of partner countries from the ASEAN region. Apart from this, several 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. Apart from publication in peer-reviewed journals, it also published 14 new printed materials (6 manuals, 5 flyers, and 3 books) and other information materials about AQD. Significant efforts were also made in upgrading and updating the AQD's website.

2. PLANS IN 2011

AQD will address the remaining technology gaps identified for various aquaculture commodities. This will also include putting in high 'gear' the activities that will ensure adoption and uptake of AQD's viable aquaculture technologies by its targeted clients. The ICDSA initiative, ABOT AquaNegosyo and AQD's training and information activities will continue to play a more active role in this aspect.

For better response of AQD to emerging issues on fisheries sustainability and food security, the Department will continue activities that will facilitate the shift in approach of Departmental Programs from commodity to thematic. Hence, while the Departmental Programs in 2011 are still the same as in 2010, the activities of AQD in 2011 will also involve holding the in-house Strategic Planning meetings to finalize the priority areas and plan of actions on the following thematic areas: i) Meeting socio-economic challenges of aquaculture in South East Asia; ii) Quality seed for sustainable aquaculture; iii) Healthy and wholesome aquaculture; iv) Maintaining environmental integrity through responsible aquaculture; and v) Adapting to climate change. These thematic areas were discussed in detail during the RTC on Aquaculture held in March 2010 in Bangkok. It is also expected that these will be the new Departmental Programs of AQD in 2012.

3. LIST OF PROGRAMS

Departmental Programs Implemented in 2010:

- 1) Mollusk
- 2) Mud Crab and Shrimp
- 3) Marine Fish
- 4) Small-holder Freshwater Aquaculture
- 5) Seaweed
- 6) Aquatic Ecology

Proposed Departmental Programs for 2011:

- 1) Mollusk
- 2) Mud Crab and Shrimp
- 3) Marine Fish
- 4) Small-holder Freshwater Aquaculture
- 5) Seaweed
- 6) Aquatic Ecology

PROGRAM DOCUMENT

Program Category: Departmental Program
Program Title: Mollusk Program
Responsible Department: SEAFDEC Aquaculture Department
Total Duration: 2005-2010

1. INTRODUCTION

In recent years, there was a fast decline of mollusk population from the natural fishery due to heavy exploitation of the resource coupled with habitat destructions and loss of the ecological niche. To address this problem, stock enhancement program of threatened species was developed. As part of the program, there is a need to develop breeding and seed production technologies of the appropriate species.

The increasing demand for abalone (*Haliotis asinina*) in both domestic and international market led also to the creation of science-based and economically-viable technologies for breeding, seed production, and farming of commercially-important marine mollusk. In addition to abalone, other marine mollusk of interest to the region include the window-pane oyster *Placuna placenta*, top shell *Trochus niloticus*, turban shell *Turbo marmoratus*, angelwing clam *Pholas orientalis*, and venus clam, *Paphia undulata*.

2. PROGRAM

2.1. Objectives

The program aims to develop and demonstrate economically-viable mollusk production technologies suitable for coastal communities. Specifically, the Program will: i) produce seed stocks for stock enhancement and abalone grow-out aquaculture; ii) create a science-based technology that is economically-viable and appropriate to the region; iii) demonstrate developed technologies for seed production and culture; and iv) disseminate information on SEAFDEC/AQD developed technologies

2.2. Program Description

The program is designed to generate, package, demonstrate, and promote science-based and economically-viable technologies for breeding, seed production, and farming of commercially-important marine mollusks. To implement the program, studies are focused on understanding the biology, breeding and seed production of mollusk species.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

The program is composed of five studies that tackle the three culture phases of abalone culture. These culture phases are the following: i) Hatchery. There is a continuing effort to refine hatchery techniques to improve settlement and survival of larvae. At present, the settlement (3.5%) and survival (0.3-1%) of post-larvae is still considered as the bottleneck of seed production; ii) Nursery; and iii) Grow-out. There is a need to study the nutritional requirement of abalone and develop diet that will improve the growth of abalone and will partially replace the limited amount of seaweeds.

Studies on other marine mollusk (window-pane oyster *Placuna placenta*, top shell *Trochus niloticus*, turban shell *Turbo marmoratus*, angelwing clam *Pholas orientalis*, and venus clam, *Paphia undulate*) were not implemented due to lack of technical staff.

Produce seedstocks for stock enhancement and abalone grow-out aquaculture:

Experiments were continued to refine the hatchery and transport techniques for the donkey's ear abalone. Results showed that larvae at 100 larvae ml⁻¹ can be transported for 1 hour only and 25-50 larvae ml⁻¹ for 5-10 hrs. Larval transport experiment (with shaking) also indicated that percent survival was significantly affected by the combination effect of loading density and transport time.

Result of the juvenile (1.0-1.5 cm) transport experiment showed that there was no significant difference in survival when juveniles were packed at 100 individuals/pipe and 150 individuals/pipe after 16 hrs transport time. However, lower survival was observed after 24 hours at 150individual/pipe which might be due to higher ammonia level at higher loading density. When travel time was prolonged to 32hrs, very low survival was attained in both densities.

The breeders that were collected from Masbate had produced two batches of F₁ cohorts and these were monitored for settlement, survival, and growth and were compared to HB cohort. The growths in terms of shell length in both cohorts were also not significantly different. The remaining breeders from Palawan had produced their F₁ cohorts and monitoring was still ongoing.

Sampling of biofilms on abalone settlement plates was conducted for associated total bacterial (TPC), presumptive vibrios (PVC), luminous vibrios (LBC), and presumptive *Pseudomonas* and *Aeromonas* (PPA) population, as well as for its diatom and algal components. *In situ* community structure of biofilms on settling plates viewed by scanning electron microscopy showed a thick growth of various diatoms and sparse growth of filamentous algae, a reflection of the seeded diatom slurry during plate preparation. Activities for the last quarter and 2011 will be wet season sampling of biofilm on abalone plates for bacterial and algal diversity, continuation of identification of bacterial isolates, determination of pathogenic and beneficial bacteria, and mass production of beneficial bacteria.

The slow growth of abalone during grow-out rearing is one constraint that is being addressed by the Program. Hence, experiments were continued to develop and evaluate the microparticulate diet for feeding post-larval settlement and metamorphosis. Microparticulate diets containing varied levels of protein and energy have been formulated and prepared. Preliminary runs were started for the feeding trials but the larvae available were not enough for assignment to the different dietary treatments. More post-larval samples will have to be gathered for the feeding trials.

Create a science-based technology that is economically-viable and appropriate to the region

As part of the initiative to develop the maturation diet for abalone, arrangements have been made to initiate the experiment that will evaluate the effects of dietary protein/energy levels on abalone reproduction. Formulation and preparation of diets of varying protein/energy levels to be used for the experiment have been done and are now ready for use. Breeders are now being conditioned in tanks. Dietary treatments have already been allotted for each tank and feeding trials will commence as soon as the conditioning time is over.

The settlement (3.5%) and survival (0.3-1%) of post-larvae are considered the bottlenecks of abalone seed production. Hence, an experiment was conducted to isolate and cultivate the diatom, *Cocconeis* sp. for settlement, growth and survival of post-larval abalone. The study was able to isolate two strains of *Cocconeis* sp. from abalone nursery tanks and also identified the culture requirements (light intensities and enrichment media) for mass production. A test on *Nitzschia* sp. strain isolated from Igang showed that the species preferred higher light intensity. The findings from these studies are expected to help improve the settlement and growth of post-larvae during the hatchery phase.

The marine algae/fungi, *Traustochytrids* is one of the potential sources of fatty acids (high omega fatty acid) that could enhance the diet of the abalone juveniles. Hence, experiments were conducted to optimize the culture conditions of this species using the commercial glucose and cane molasses as carbon source for mass production. Initial findings showed that biomass (wet weight in grams) of *Traustochytrids* generally increased with increasing molasses concentration. Two more runs will be conducted on the various concentrations of glucose (commercial) and cane molasses using falcon tubes. Protocol in assessing the cell growth through photometric method will also be standardized.

To improve the production of abalone, experiments were initiated to develop the recirculating system for the intermediate nursery rearing and broodstock maintenance of donkey's ear abalone. Four treatments were tested to assess the growth performance of the abalone: *Gracilaria*-fed abalone in flow-through system; artificial diet fed abalone in flow-through system; *Gracilaria* fed abalone in recirculating system; and artificial diet fed abalone in recirculating system. After 10 weeks of culture average, body weight (1.21 g) and length (18.33 mm) was obtained in artificial diet fed abalone in recirculating system and lowest, in *gracilaria*-fed abalone in recirculating system.

To improve the production of abalone juveniles, experiments were conducted on nursery rearing and culture of tropical abalone in plastic trays at different sites. Stocking of abalone juveniles with 3 cm shell length for grow out studies in black, plastic trays was done with a total of 6,000 pieces stocked in black prefabricated trays. The total abalone juveniles reared in the nursery currently is 48,000 pieces.

Experimental trials on hybridization of Philippine native abalone species were done as part of the future strategy to improve stocks and enhance its market potentials. The parental HAFPM hybrid (*H. asinina* female x *H. planata* male) and HAFGM hybrid (*H. asinina* female x *H. glabra* male) had produced 9,043 juveniles and 6,998 juveniles, respectively. However stocks were reduced later due to gradual and unpredictable mortalities.

Growth of hybrid and pure *asinina* was compared in terms of shell length and body weight. Hybrid HAFGM achieved optimum growth in terms of body weight after 360 days of culture (30.46 g) and shell length (4.67 cm) after 390 DOC. While pure *asinina* attained maximum growth after 405 days (30.06 g) in body weight and shell length (4.56 cm) after 390 days. Growth of F₁ generation of HAFGM was better compared to pure *asinina* after 240 days.

Hybrid *planata* (*H. asinina* female x *H. planata* male) attained maximum growth in terms of body weight (49.08g) after 570 days and standard length (5.40 cm) after 585 days. While pure *asinina* attained its maximum growth in body weight (34.86 g) after 510 days and standard length (4.88 cm) after 525 days. However, F₁ generation of hybrid *planata* (HAFPM) grew slower after 420 days compared to pure abalone, indicating that the characteristic was inherited from the female parent at this generation.

The maximum growth of putative triploids and pure abalone was attained after 405 days of rearing. In all treatments, the gonadal index is now in stages 1 and 2.

Stress stress/salinity tests were also conducted to compare the performance of the 2 hybrids and pure *asinina*. Tests showed that the 2 hybrids had better survival than the pure *asinina* at 25ppt. However, the F₁ HAFPM had highest survival of 91.67% after 168 hours at 20 ppt.

Demonstrate developed technologies for seed production and culture of abalone

The large-scale production of donkey's ear abalone juveniles was continued. A total of 80,398,236 pieces veliger larvae were produced from January 2010 – Sept. 2010 (survival rate 31.68 – 53.20 %). A total of 203,490 pieces abalone juveniles (SL: 5-8 mm) were produced from

January 2010 – September 15, 2010. Total number of hatchery bred breeders is 464 pieces while wild – caught breeders is 216.

Two verification experiments on the effects of photo-period were also conducted. To minimize inbreeding, crossing of wild females to hatchery bred males is in-progress. The incoming cohorts are now used as breeders in the hatchery.

4. PROPOSED ACTIVITIES FOR THE YEAR 2011

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

- Improvement of fecundity and seed quality of wild breeders from other sources (continuing)
- Use of anaesthetic for mechanical sorting (new)
- Selective breeding of abalone (continuing)
- Health management of cultured abalone in the hatchery (new)
- Identification of pre-disposing factors that may lead to the occurrence of abnormalities in the shell and foot muscles of marketable-size abalone (new)
- Development and evaluation of microparticulate diet for feeding post-larval abalone, *Haliotis asinina* Linne on the onset of post-larval settlement and metamorphosis: and metamorphosis: Protein/energy levels (continuing)
- Development of maturation diet for tropical donkey's ear abalone, *H. asinina*: Effect of dietary protein/energy levels on abalone reproduction (continuing)
- Isolation and cultivation of *Cocconeis* and *Nitzschia* sps. for survival of post-larval abalone *Haliotis asinina* (continuing, title modified)
- Optimization of culture conditions of the marine thraustochytrid strain, *Schizochytrium* sp LEY7 (continuing)
- Development of recirculating system for the intermediate nursery rearing and broodstock maintenance of the donkey's ear abalone, *Haliotis asinina* (continuing)
- Experimental hybridization of Philippine native abalone species; *H. asinina*, *H. glabra*, *H. ovina*, *H. varia*, *H. planata* and triploid induction of *H. asinina*
 - Grow-out trials for hybrid stocks
 - Verify market acceptance
 - Verification runs of hybridization in bigger scale
- Application of PCR-RFLP as a molecular tool to confirm hybridization, triploidy and to reveal genetic heterogeneity among F₁ generations of the *H. asinina* (new)

PROGRAM DOCUMENT

Program Category: Departmental Program
Program Title: Shrimp and Mud Crab Domestication Program
Responsible Department: SEAFDEC Aquaculture Department
Total Duration: since 2003

1. INTRODUCTION

Shrimps and mud crabs support one of the most valuable fisheries in the region. However, the culture of *Penaeus monodon* has continued to rely totally on the use of wild-caught broodstock and spawners, resulting in unpredictable production outcomes attributable to inconsistent quality of the spawner. Similarly, mud crab culture has relied on wild seeds resulting in overexploitation and habitat losses. This has led to the inadequate supply of nauplii source in *P. monodon* and to both reduced landings and smaller mean size of *Scylla* spp. collected from the wild. The significant decrease highlights the need to manage the resources and develop seed production techniques. The life cycle of both *P. monodon* and *Scylla serrata* has been completed in captivity, a prerequisite to domestication. All phases of shrimp and crab culture (broodstock, hatchery, nursery and grow-out) have been done, and can be integrated to produce domesticated broodstock. Domestication of shrimp and mud crab is a prerequisite to selective breeding program, which allows for the strict disease prevention and control, and present other opportunities for the improvement of farmed stock.

In the process of developing techniques for the production of broodstock and spawners, optimal nutrition will also be considered. Although the grow-out technique of crab has been established for decades, a formulated diet for the various phases of culture has not been developed to reduce dependence on the more expensive live food such as fish and mollusks.

2. PROGRAM

2.1. Objectives

The main goal of the Program is to develop a technology for the sustainable production of good quality seed and captive broodstock of commercially-important crustacean species particularly, *P. monodon*, *P. indicus* and *P. merguensis* for shrimps and *Scylla* spp. for crabs, that can be genetically selected for desired heritable characteristics, particularly disease resistance and/or fast growth.

For shrimps, more specific objectives are: 1) to generate baseline information on the genetic diversity of shrimp stocks; 2) to develop the technology on producing good quality captive broodstock of *P. monodon*, *P. indicus* and *P. merguensis*; 3) to develop or improve diets for captive broodstock; 4) to verify use of white shrimp grow-out diet using environment-friendly schemes; and 5) to characterize IHHNV infecting both *P. vannamei* and *P. monodon*.

For mud crabs, the specific objectives are: 1) to generate baseline information on the genetic diversity of mud crab species from various sources; 2) to use molecular genetic tools in effective management and in selective breeding; 3) to develop technology for domestication of *S. serrata*; 4) to mass produce seeds and juveniles of *Scylla* spp. and further improve survival and hatchery/nursery rearing techniques; 5) to reduce cannibalism of crab juveniles through physiological, nutritional and environmental approaches; 6) to reduce the use of fish by-catch in the nursery, grow-out and fattening through development of suitable diets; 7) to accelerate the adoption of improved mud crab technologies; and 8) to assess the the seasonal and long-term trend in seed stock in natural habitat.

2.2. Program Description

The program consists of studies that address the problem on declining supply of good quality broodstock and seed of indigenous species of shrimp and mud crab. Domestication, a prerequisite to selective breeding programs, is pursued by monitoring the genetic structure of base populations of target species, establishing husbandry techniques, developing suitable diets for the different life stages, and culture of live food necessary for good reproductive performance. Studies on husbandry, which includes all phases of culture such as broodstock management, larval rearing, nursery and grow-out, will focus on strategies to improve reproductive performance, survival, growth, and prevention of disease. Stock assessment and socio-economics of each culture phase are included to evaluate impacts of adoption of generated technologies. The activities are linked with the regional programs under the ASEAN-SEAFDEC Fisheries Consultative Group such as Sustainable Aquaculture.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

A. Shrimp

Domestication of the indigenous white shrimp species *Penaeus merguensis*/ *P. indicus*

P. indicus broodstock were stocked in tanks at a ratio of 1 female: 2 males and fed with diets containing marine annelid meal at levels of 10% and 20% of the basal diet, with or without live annelids. Spawnings were observed at mid July until the present date, but only 50% of the spawnings produced nauplii. The other 50% resulted in eggs with arrested development. F₁ stocks resulting from reciprocal matings among Antique, Tigbauan and Negros stocks were obtained and are being grown in tanks. Initial selection for the bigger-sized stocks was done for two of the families.

Comparative performance of wild and pond-sourced *Penaeus monodon* broodstock fed natural and artificial diet

The experiment that is aimed to compare the performance of wild and pond-sourced *P. monodon* fed natural and artificial diet was continued. Wild sourced *P. monodon* broodstocks fed the all natural diet consisting of the fresh frozen polychaetes had significantly lower spawning rates and had shown lesser efficiency in stimulating ovarian development than those fed the artificial diet. Survival however, was not significantly different for groups fed the artificial and natural diets. The nutrient composition in terms of protein and polyunsaturated fatty acids were higher in the artificial diet formulation compared to the natural diet, which could be a factor for the effective reproductive performance of the broodstock fed this diet. For pond-reared stocks, results are not showing good trends on the different dietary treatments. Mass mortalities occurred but these may have been caused by other factors such as the quality of water especially during typhoon, poor genetic quality of the pond-sourced broodstock and disease.

Culture of marine annelid and its use as a lipid source and as a substitute for high value marine protein sources in feeds for growth of *Penaeus indicus*, *Scylla serrata*, *Chanos chanos* and *Lates calcarifer* fry

Studies were also continued on the culture of marine annelid as a lipid source and as a substitute for high value marine protein sources in feeds for growth of *Penaeus indicus*, *Scylla serrata*, *Chanos chanos* and *Lates calcarifer* fry. *P. quarterfasegi* was cultured and sampled to assess the morphological and histological structures, reproduction potential and nutrient content. *Marphysa mossambica*, a polychaete commonly found in mangrove areas was also analyzed.

At 20, 40, 60, 80 and 100% replacement of marine protein sources with *Perinereis* (seaworm) meal showed that growth declined with increased seaworm replacement. At 3% level of

incorporation in the diet, seaworm meal, squid meal and their 1:1 combination promoted higher growth ($P < 0.05$) in white shrimp and mud crab than those fed the control diet (no seaworm and squid meal). Survival was not affected by diets.

Polyculture of *Penaeus monodon* with *Siganus guttatus* in a biosecured environment friendly pond culture system

Another experiment that was initiated was the polyculture of *P. monodon* and *S. guttatus* in a biosecured environment friendly pond culture system. However, stocks were harvested ahead of schedule since these were found to be positive for WSSV. A total of 658 kg was harvested in pond.

B. Mud Crab

Concerning the mud crab, studies were continued to domesticate, refine the broodstock management, seed production, and culture techniques during the nursery and grow-out phases at different production systems

Refinement of feeding and water management strategies in larval rearing of mud crab

S. serrata broodstocks obtained from Capiz spawned but only three produced viable larvae. Delayed spawnings and morphological abnormalities in hatchery-reared crabs were also observed in the nursery and grow-out phases and are suspected to be due to antibiotics or other chemical treatments applied during the hatchery phase. Antibiotics were applied during larval rearing (zoeae to megalopa) to determine the effects on growth, survival and morphology of crabs. The percentage occurrence of abnormalities increased with the increasing concentration of antibiotics. Increase in body weight of juveniles was higher in oxytetracycline-treated crabs than furazolidone-treated crabs at larval stage.

A diet was formulated for later larval stages of mud crab to reduce the molt death syndrome at Zoea. Z3 were stocked and fed with either formulated diet, natural food (*Artemia nauplii*) or a combination of both. Those fed formulated diet alone were not able to molt to the megalopa stage. Larvae fed with the other two treatments had survival rates and population stage indices which were not significantly different. The effect of enriched *Artemia* was also tested. Survival was higher in larvae fed *Artemia* (3-5 days old) enriched with DHA protein SELCO (3%) than those fed *Artemia* without enrichment (1%). Molt duration from Z3 to megalopa did not differ between the two treatments.

Effects of dietary tryptophan on the antagonistic behavior of mud crab *Scylla serrata*

The effects of dietary tryptophan on the antagonistic behaviour of mud crab were also tested. Frequency and intensity of attacks performed by dominant mud crabs were analyzed from the confrontations. Mean frequency and intensity of attacks were significantly lower in mud crabs receiving the 1% TRP level compared with mud crabs fed the control diet. No significant difference on the frequency and intensity of attacks on mud crabs receiving the 0.5% TRP level compared with control.

The effects of exogenous serotonin on the antagonistic behavior of dominant mud crab were investigated. Mean frequency and intensity of attacks by dominant mud crabs were significantly higher before injection and decreased significantly after serotonin injection. Another experiment was also conducted to evaluate the effects of exogenous serotonin on shelter competition of juvenile mud crab. Results showed that during the day, bigger mud crabs injected with crab saline occupied the shelter more often than mud crabs injected with serotonin. However, during night time, both sizes of crabs were often observed outside the shelter, suggesting that shelter occupancy may not be that important in the evening due to their active nocturnal feeding.

Nursery production of mud crab *Scylla serrata* in brackishwater ponds

The nursery production of mud crab in brackishwater ponds was also continued. Megalopae or crab instars obtained from the Tigbauan Station Hatchery were stocked in net cages set inside a 600 m² ponds in Dumangas Brackishwater Station. Five experimental runs were conducted and a total of 22,659 crablets were produced, with a survival rate of more than 50%, except for one run which had a low survival of 35%.

Development of practical feed for the grow-out culture of mud crab, *Scylla serrata*

Efforts were continued in terms of development of practical feed for the grow-out culture of mud crabs. Mud crabs were fed with two test diets and grown in ponds for about 140 days. Average weight of harvested mud crabs was 425 g. The analysis of chitin of this experimental run is ongoing. The last run for this experiment was started in June 2010. After 80 days of feeding, average weight of sampled mud crabs ranged from 220 to 440 grams from an initial weight of 2-3 grams. This run will be terminated in November 2010.

Production of mud crab (*Scylla serrata*) with milkfish (*Chanos chanos*) and siganid (*Siganus guttatus*) in brackishwater ponds

The effects of AQD formulated diets in terms of production performance of Mud crabs reared in brackishwater ponds with milkfish (*Chanos chanos*) and siganid (*Siganus guttatus*) were assessed. Crabs were fed a combination of 60% low-value fish and 40% SEAFDEC-AQD-formulated diet (pellet), and later to 75% and 25%, respectively. The formulated feeds contained 40-44% crude protein. SEAFDEC-AQD-formulated feeds were given to milkfish and siganids at 3% of their body weight. It was observed that the formulated feeds intended for the crabs were also eaten by the milkfish and siganids. At day 133 of culture, the average body weight of crabs was 300 grams. The siganids were 100 grams and the milkfish 280 grams at day 170. Partial harvesting was done to thin out the crab population.

Fattening of mud crabs in the mangrove using individual bamboo pens and fed with trash fish or mussels was done. Crabs with a biomass of 121.64 kilograms were stocked from January to September 2010. About 322 pieces of fattened crabs with a biomass of 92 kg were harvested in the same period. Of these, 170 pieces were *S. olivacea*, 27 pieces were *S. serrata* and 110 pieces were *S. tranquebarica*. Thirteen of these harvested crabs were fed with 100% fattening pellets.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

- In line with the development of a viable technology to produce captive broodstock, studies on domestication/selective breeding of indigenous white shrimps and black tiger shrimp will be continued next year.
- Monitoring of growth, fecundity and disease resistance through responses to challenge tests will be conducted for the F₁ families in 2011.
- Since use of appropriate feeds can greatly enhance reproductive and growth performance, annelid culture will be continued using wild stock and those produced in captivity this year.
- Demand of *P. indicus* fry is low due to the perception that stocks disappear in the middle of culture. Thus, short term (2 months) culture of this species will be conducted in small ponds next year to produce table size (9-11g) white shrimp. Economic analysis will be conducted to determine its feasibility.
- For mud crab, selective breeding will be continued to maintain the good quality of broodstock. This will focus on refinement of techniques for seed production to improve

reproductive performance, growth, and survival of larvae and juveniles. This will also include test of diets for critical larval stages.

- Based on recent results, dietary tryptophan appears to suppress the aggressive behavior of mud crab, and may therefore be effective in reducing cannibalism. However, its effect on the appetite of juvenile crabs has to be investigated before this can be verified in larger scale during the nursery culture. The aggressive behavior of mud crab will also be studied in relation to environmental factors like temperature, photo-period, sex and species differences.
- Another run on the polyculture of mud crab with milkfish will be conducted. Siganids will no longer be used. A lower stocking density of 0.1crab/m² will be tried and an economic analysis will be done to evaluate its profitability.
- Flyers on seed production and posters on different mud crab and shrimp species will be targeted for publication. Training on Mud Crab Seed Production and Grow-out will also be conducted.

4.2 Expected Outcomes

The program activities in 2011 are envisioned to result in improvement of the present survival and reproductive performance of broodstock; development of formulated diets for shrimp and mud crab broodstock and grow-out and fattening of mud crab; demonstration of the feasibility of grow-out culture of indigenous white shrimp species; and development of techniques for some aspects of marine annelid production. Flyers, posters, and training courses are foreseen to be effective tools in dissemination of technologies to private and public sector.

PROGRAM DOCUMENT

Program Category: Departmental Program
Program Title: Marine Fish Program
Responsible Department: Aquaculture Department
Total Duration: 2009-2012

1. INTRODUCTION

The Marine Fish Program of the SEAFDEC Aquaculture Department (AQD) aims to continually improve the technologies for the culture of marine fishes for sustainable aquaculture development, poverty alleviation in the countryside, and reinforcement of aquatic resources and food security in the Southeast Asian region. Marine fishes such as milkfish, grouper, sea bass, mangrove red snapper, rabbit fish, pompano, kikeru, Napoleon wrasse, hybrid red tilapia, and seahorse are among the species being studied in 27 research topics in the Program. These studies cover the various stages in culture involving broodstock, seed production, nursery and grow-out culture of marine fishes.

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*); b) develop breeding and seed production technologies for Asian pompano (*Trachinotus blochii*); c) develop practical feed for Barbour's seahorse (*Hippocampus barbouri*) broodstock; and d) develop polyculture techniques for saline-tolerant, hybrid red tilapia in brackishwater ponds.

2.2. Program Description

The program comprises the studies under Research and Technology Verification and Demonstration Divisions. Spanning the various stages in culture involving, broodstock, seed production, nursery, and grow-out culture of marine fishes, the studies also involve the hatchery production of various marine fishes and the production of marine fishes in brackishwater ponds and in floating net cages. The studies are being done in laboratory, broodstock, and hatchery/nursery facilities at the Tigbauan Main Station (TMS), brackishwater ponds in Dumangas Brackishwater Station (DBS), and in floating net cages at the Igang Marine Station (IMS).

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

Broodstock

Development of assay utilizing IGF-II mRNA expression as marker for egg quality in grouper and siganid

Previous studies of AQD revealed that insulin-like growth factor II (IGF-II) mRNA expression could be used as a predictor for percent development during the early embryo stage in marine fishes. The focus of work in 2010 involved the standardization of the technique using real time-polymerase chain reaction (RT-PCR). Replicates of grouper egg samples of varying sampling weights that did not yield crossing threshold values assayed last year was repeated and yielded positive results. The work is being continued to develop the assay method.

Evaluation of the effects of dietary vitamin C on reproduction, egg and larval quality and immune responses of grouper *Epinephelus fuscoguttatus*

Grouper broodstock stocked in 50-m³ tanks were fed the three diets containing graded vitamin C levels. Only 1 spermiating male was obtained and observed to display cannibalistic behavior. Mortalities occurred due to problem in water quality but stocks have all been replaced.

Reproductive biology of pompano and other potential species for aquaculture

Pompano breeders were induced bred from January to April 2010. The total hatched larvae were 521,000 and fertilization rate ranged from 6-70%.

Separate experiments were conducted on Pompano spawners to evaluate their reproductive performance at different stocking ratios of males and females in breeding hapas and also to determine the optimum dosage of HCG that would induce spawning. The females spawned in all the treatments used but embryonic development did not happen. Further experiments will be conducted.

The efficacy of dosage of LHRH or HCG to induce spawn the kikero (*Scatophagus argus*) spawners from Sagay, Negros Occidental was also assessed. Spawning occurred on fish treated with LHRH but embryonic development did not proceed due to salinity fluctuations during water change. To help address this, experiments were initiated to determine the optimum salinity for kikero larvae. The optimum salinity for larval survival was found to be about 15-20 ppt. Lower salinities will be tried in the next run.

Biology and Seed Production of Napoleon Wrasse *Cheilinus undulates*

The study was initiated in collaboration with the Palawan Aquaculture Association Facility. Broodstocks kept in 60-ton circular tank spawned. However, fertility and hatching rates were still low which could be due to a high number of female to male ratio kept in spawning tank. Mortalities of larvae at early stage of development were attributed to lack of appropriate larval food. The study is still on-going.

Hatchery and seed production

Optimization of seed production techniques of milkfish through feeding fortified diet: Effects on egg and fry quality

In milkfish broodstock, the fortification of the diet with vitamins and lipids improved the spawning frequency, egg production and fertilization rate. However, survival rate of milkfish fry has been inconsistent. Results of experiments showed that the early introduction of larval diet and emulsion to enrich the rotifer reduced the incidence of abnormal larvae.

Refinement of seed production techniques for high-value marine fish species such as grouper, red snapper, sea bass and pompano

The intervention used to improve the seed production techniques for high-value marine fish will use largely formulated diet with lesser dependence on brine shrimp and minced trash. These include the use of capsule ARA, beta-carotene and vitamin C to the broodstock, use of SEAFDEC emulsion for the enrichment of rotifers and artemia, co-feeding of natural food and SEAFDEC larval diet at early age of the larvae, and lowering of water salinity to reduce cannibalism. High quantities of eggs and normal larvae were obtained from groupers, snapper, sea bass, and rabbit fish, but minimal quantities were obtained from pompano. More trials will be conducted to demonstrate the efficacy of the interventions.

Growth, survival and nutritional composition of grouper larvae fed formulated diet

MERA LV was tried at 0.5, 1.0, or 1.5 g/ton and compared with control of natural food and larval diet. One successful run reached up to day 60 with survival at 4-7.5%. Average body weight was highest in those given 1.5 g/ton but was not significantly different from those fed 1.0 g/ton and control.

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

Previous results indicated that mysids are potential live food substitute for *Artemia* in grouper larval culture because they increased the levels of highly unsaturated fatty acids and digestive enzymes in larval grouper. Thus, an intensive culture system was initiated in 2010 to mass produce mysids. A laboratory scale of an air lift culture system was developed and adapted. However, mortalities occurred during the first and second runs which might be due to salinity stress during transport. Fecundity as well as the appropriate algal food for the rotifers will be further investigated to improve the survival of mysid hatchlings.

Nursery

Demonstration of viable technology for fingerling production in ponds

Studies were continued to demonstrate the viable technology for fingerling production of sea bass, *Lates calcarifer*, mangrove red snapper, *Lutjanus argentimaculatus* and siganid *Siganus guttatus* fingerlings in ponds.

Snapper fingerlings stocked in brackishwater ponds and given commercial diet containing 46-48% protein attained average body weights that ranged from 48-60 g (FCR=1.3) after 150 days of culture. With regard to siganids, stocks fed filamentous algae for the first 45 days after which they were given formulated diet of 32-39% protein, attained average body weight of 27 g. At day 150 they attained average body weight of 95 g, the size desirable for preparation of dried fish or other value-added products.

Grow-out and other studies

Verification of rabbit fish *Siganus guttatus* grow-out diets in cages in ponds

This study aims to verify and evaluate the economic performance of feeding rabbit fish using SEAFDEC AQD grow-out formulated diet in cages in the pond. Rabbit fish (*S. guttatus*) stocked in B-net cages in pond were fed with SEAFDEC AQD-diet, commercial feed, SEAFDEC-diet 50% + seaweed 50%, and seaweed. Survival was greater than 99% in all treatments, but fish fed SEAFDEC AQD formulated diet still had the highest average body weight and specific growth rates among all treatments. Fish given AQD diet grew significantly better among the treatments. Growth of fish given SEAFDEC diet (50%) + seaweed 50% was comparable with commercial milkfish diet but significantly better than those given seaweed alone.

Refinement of intensive grow-out culture of sea bass in brackish water pond using SEAFDEC formulated diets with higher energy level

Sea bass grown at a stocking density of 1/m² and given SEAFDEC AQD diet compared well with those given commercial feed. The third trial was done but heavy mortalities occurred at day 151 due to power failure which resulted in low dissolved oxygen. A fourth trial is being started.

Refinement and dissemination of intensive grow-out technique for the polyculture of milkfish and mud crab (*Scylla* spp.)

Mud crabs were stocked in the ponds with the milkfish. About 2.2 tons milkfish were harvested with average body weight of 575 g (about 160 day of culture) and 51 pieces of mud crabs. Economic analysis will be done.

Net cage culture of sea bass in freshwater using formulated diets

Sea bass stocked in floating net cages in Lake Vito, Dingle, Iloilo were fed SEAFDEC diet or commercial feed to compare their growth performance in freshwater. After 240 days, fish fed SEAFDEC diet had higher average body weight and survival than those fed commercial diet.

Phased diets (starter, grower, and finisher) for grouper cultured in floating net cages.

Grouper (*E. coioides*) were reared in marine floating net cages fed SEAFDEC starter, grower, or finisher diets. After fourth sampling, the stocks had average body weight of about 220 g. Survival was at 100%.

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

Milkfish juveniles were obtained from Dumangas Brackishwater Station for feeding and toxicity experiments using the fermented ingredients. Fermentation experiments with ipil-ipil leaf meal for diet formulation for milkfish are on-going.

Soy products as alternatives to fish meal in practical feeds for milkfish

Experiments were conducted to test the optimum level of soy protein concentrate (SPC) inclusion in diets containing fish meal and soybean meal. After 12 weeks, fish fed diets containing SPC at 30% gave optimum growth which was not significantly different from those given 40% SPC. Survival was 100% in all the treatments tested. Pilot scale testing of milkfish diet in floating net cages will start soon.

Digestibility and effective level of meat and bone meal in formulated diet for milkfish grown in fresh and sea water

Meat and bone meal was also tried as an alternative protein source to fish meal for milkfish reared in seawater or freshwater. After 30 days, survival of juveniles in freshwater was 100% and weight gain ranged from 95-179%. After 60 days, survival in sea water ranged from 84-96% and no significant differences in weight gain were observed.

White cowpea meal as alternative plant protein source for grouper

In finding alternatives to fish meal in aquaculture feed, white cowpea meal was tried to partially replace fish meal in grouper diets. The third experiment to look at the effect of feeding frequency using grouper diet with cowpea is on-going. After four months of feeding, fish being fed two times a day (control) gained an average weight of 121 g, comparable to those fish fed only once a day (119 g). Likewise, survival rate between the two treatments was comparable (64-68%). In terms of body weight gain, SGR, FCR and survival rate, no significant differences were obtained in the treatments, indicating that feeding once a day is appropriate for groupers.

Formulated Feed for Adult Seahorses

In February 2010 a new batch of seahorses (*H. barbouri*) was used for the study. Adult stocks were given natural food and a moist diet containing 5% carrageenan to test for acceptance. Other diet types have been tried but so far none has been acceptable to adult seahorses. The study will be terminated at the end of the year.

Intensive production of red tilapia hybrid in polyculture with siganid in brackishwater ponds

Siganids were stocked with red tilapia. At the end of June 2010, average body weights of red tilapia and siganids fed SEAFDEC diet + vegetable scraps (80:20) were 198 and 207 g, respectively. For those fed SEAFDEC diet alone, average body weights for red tilapia and siganid were 224 and 204 grams, respectively. Some siganid were found to be maturing. Salinity of 36-41 ppt caused higher mortality for red tilapia, but did not cause any problems for siganid. Red tilapias also became stressed at higher temperatures.

Characterization of innate immune response of *Epinephelus coioides* to *Vibrio* sp.

The study aims to characterize the host immune response of grouper against *Vibrio* sp. using cellular and humoral assays. Initial results showed increasing respiratory burst activity with progress of infection. Skin, gills, kidney, liver, and spleen samples have been collected up to day 5 for the analysis of immune response gene expression. Work on other immune parameters is ongoing.

Experiments to verify the pompano grow-out diets in cages in ponds and in floating net cages

Pompano were stocked in cages in ponds and fed either SEAFDEC diet and commercial diet. At day 60, those fed SEAFDEC diet A (40% CP) had average body weight of 263 g, SEAFDEC diet B (45% CP) 271 g, diet C (commercial diet 1) 279 g, and diet D (commercial diet 2) 271g. In the grow-out experiment conducted in floating net cages, stocks were fed milkfish commercial feed, commercial milkfish feed + commercial pompano feed, or commercial pompano feed. At last sampling, those fed commercial pompano feed had highest average body weight (536g) while lowest, in stocks fed milkfish commercial feed.

Semi-intensive production of rabbit fish and snapper fed SEAFDEC diet in pond

Rabbit fish (initial average body weight 100 g) was stocked at 5000/ ha. At day of culture 90, average body weight was 233 g with specific growth rate at 0.93%/day. Termination will be after 150 days of culture.

Bioenergetic studies on grouper larvae

The study was also continued to investigate the bioenergetic aspects of early development in grouper *Epinephelus coioides*. During the transition from endogenous to exogenous feeding, larvae at the mixed feeding period showed the highest oxygen consumption compared with those at the endogenous and exogenous feeding periods. Size graded juveniles that are bigger have highest metabolism. The experiment will terminate in December 2010.

4. PROPOSED ACTIVITIES FOR THE YEAR 2011

- Experiments to evaluate the effects of elevated temperature or prolonged exposure to high temperature on reproductive performance and recruitment (milkfish, grouper, sea bass, mangrove red snapper, rabbit fish and pompano)



- Evaluation of the best feed formulations for commercial scale production of important marine fishes
- Continuation of development of assay utilizing IGF-II mRNA expression as marker for egg quality in grouper and siganids
- Experiments to determine the optimum conditions for breeding and larval development (for Napoleon wrasse and other grouper species)
- Verification and testing in commercial scale, production trials in pompano
- Field testing of the vaccine to control viral diseases of marine fish

PROGRAM DOCUMENT

Program Category: Departmental Program
Program Title: Small-holder Freshwater Aquaculture Program
Responsible Department: SEAFDEC Aquaculture Department
Total Duration: 2009-2012

1. INTRODUCTION

In developing countries in Southeast Asia, the indigenous freshwater species abound in vast areas of inland waters. Proper utilization and management of these resources for mankind's sustenance will definitely provide solutions not only to food security but also to poverty alleviation which is another basic regional concern. Thus, marginalized fisherfolks from rural communities who engage in backyard fish-farming, if given proper training on fundamental aquaculture concepts, shall be able to provide their families food on the table and alternative livelihood opportunities.

SEAFDEC/AQD, through its Small-holder Freshwater Aquaculture Program conducts scientific research to generate verified farming and seed production technologies on selected freshwater aquaculture species. These technology packages are disseminated through training and extension activities that respond to the needs of AQD's numerous stakeholders, particularly the small-scale fish-farmers. On the whole, the program is geared towards the adoption of these technologies for sustainable aquaculture development and livelihood improvement in the region.

2. PROGRAM

2.1. Objectives

To generate and transfer science-based technologies for breeding, hatchery and farming of selected freshwater aquaculture commodities for rural development and improved livelihood.

2.2. Program Description

The program involves research, technology verification/demonstration and training activities that are focused on the development of optimal breeding, seed production and grow-out culture strategies for regionally important freshwater commodities such as the giant freshwater prawn, Asiatic carps, tilapia, catfish and indigenous freshwater fish species. Apart from improved production and husbandry schemes that are packaged into aquaculture business technologies, the program also promotes the implementation of effective health management strategies for all the farmed species for their sustainable production. The activities done in pursuit of these objectives are discussed below:

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

Genetically enhance giant freshwater prawn for improved production traits

A GOJ-TF study on the development of effective broodstock management schemes to improve growth and reproductive performance in the giant freshwater prawn was started in 2010. Spawning sets of similarly aged stocks of giant freshwater prawn *Macrobrachium rosenbergii* designated as Old Calumpit (OC F₅ generation) and New Calumpit (NC F₁ generation) were stocked separately (according to strain) in concrete tanks. Similar spawning sets were also stocked in lake-based hapa net cages. Monthly monitoring from February to date showed no particular trend in terms of the best stock (OC or NC) of freshwater prawns in terms of reproductive efficiency parameters. From this breeding performance assessment study, prawn post-larvae are being continuously produced. It is to be noted that these research by-products are being sold to

serve the requirements of local prawn growers and other research agencies engaged in prawn culture in ponds.

Stock comparison experiments on growth were also conducted in lake and tank-based cages, using progenies from the two stocks – OC and NC. The tank experiment involved a comparison of the two stocks under two different feeding schemes: I-daily feeding, II- alternate feeding. After 3 months, strains (0.5 g) survived best when fed daily (90.83% for OC and 80.83% for NC). The highest growth for prawns fed daily was noted in the NC stock (4.95 g) while poorest growth was noted in OC fed alternately. On the other hand, growth trials in cages which involved two feeding treatments (treatment I – fed, treatment II-unfed) were conducted. Growth and survival were best for fed OC stocks. A confirmatory run for the same growth experiment will be conducted soon.

Develop techniques for improved seed production and lake-based cage culture of GFP

Seed production methods for the commercial *M. species (M. rosenbergii dacqueti)* have been refined to suit Philippine conditions. One larval rearing run using the green water system was conducted from January 2010 to date. Newly hatched freshwater prawn larvae were reared in fiberglass tanks using 12 ppt green water. Stocks were fed with *Artemia* nauplii from day 1 to day 7 and *Artemia* plus egg custard from day 8 until the larvae reached post-larval stage. An increase in survival and therefore post-larval (PL) production was noted this year compared to those observed in 2009. Survival and post-larvae production during the first quarter ranged from 80.32% to 90% and 49-63 larvae per liter. The average duration for metamorphosis to post larvae is 32 days. A total of 120,000 post-larvae were produced. Seedstock produced from this study are likewise available to local prawn growers.

A new study on the development of diets for giant freshwater prawn post-larvae and juveniles was recently started. Four formulated prawn diets to be evaluated involve the partial replacement of fish meal with cowpea meal at varying levels (0, 15, 30 and 45%). Instead of local fish meal, Peruvian fish meal was used as it is readily available. Another study which will focus on the development of low pollution broodstock diets for freshwater prawn will be conducted.

Finally, another new study, this time on the improvement of the production characteristics of the giant freshwater prawn reared in cages using different grow-out management strategies started last month.

Promote adoption of improved techniques for broodstock management, hatchery and nursery rearing of bighead carp

Another lake-based run for the technology verification study on the production of advanced bighead carp fingerlings will commence as soon as new cage modules are constructed. Meanwhile, although preliminary tank-based feeding trials were made and reported in 2009, Evonik-Degussa has yet to formally approve the implementation of a nutrition study on common carp. The study aims to evaluate common carp feeds supplemented with DL-methionine.

Improve and promote production technology for tilapia

An ACIAR-funded study in collaboration with the Bureau of Fisheries and Aquatic Resources (BFAR) has set up tilapia grow-out cages in Lakes Bato and Buhi in Bicol. This study is part of the Integrated Fisheries Resource Management in the Rinconada lakes: Aquaculture and Water Quality component. A separate grow-out run was made in Laguna de Bay to evaluate growth and survival of Nile tilapia under low feeding rates with daily and skip feeding. No significant differences in growth and survival of Nile tilapia were observed between the groups fed daily and the skip-feeding scheme. Feed Conversion Ratio was significantly lower in the skip-feeding compared to the fish fed daily.

Meanwhile, preliminary rearing trials in tanks to evaluate growth, survival and fillet yield of Mozambique tilapia, commercial tilapia hybrids and saline adapted Nile tilapia in brackishwater conditions were made at the Binangonan Freshwater Station. Results of the first experiment indicated that Nile tilapia generally had better meristic traits (weight gain, increments in standard length, head width, body depth and body thickness) than the red tilapia and the Mozambique tilapia stocks. The Mozambique tilapia, the most saline tolerant of the three species, had the highest survival in brackishwater at 100%. An on-going experiment for the same three species is being conducted brackishwater pond-based cages in the Dumangas Brackishwater Station

In the Tigbauan Main Station, Nile tilapia and red tilapia seedstock are being produced continuously. Sex-reversal methods are adopted in the production operations. Although tilapia seedstock are regularly available, the demand for fingerlings is just picking up after several months of poor sales. The earlier reduced demand for tilapia fingerlings in Iloilo seems to be influenced by the prolonged warm climate (El Niño) which has caused the salinity in brackishwater ponds to be unsuitable for tilapia farming.

Meanwhile, a growth experiment on tilapias in cages in a freshwater reservoir in Dingle, Iloilo fed a SEAFDEC and a commercial diet was continued in 2010. Growth performance and feed efficiency of the tilapias fed the SEAFDEC diet were similar to those fed the commercial diet. Polyculture of tilapia and freshwater prawn in cages which has been set up in the same freshwater reservoir in Dingle is currently underway.

Verify and demonstrate technology for culture of native catfish in lake-based cages and ponds

A second run on the grow-out culture of the native catfish *Clarias macrocephalus* in lake-based netcages will be started after nursery rearing in tanks. Growth and survival data from monthly samplings shall be collected.

Develop culture techniques for indigenous freshwater species in the region

Except for the climbing perch and Manila sea catfish, studies on the freshwater indigenous species silver therapon were continued. The reproductive biology of silver therapon *Leiopotherapon plumbeus* found in several freshwater habitats in Luzon was being investigated. Silver therapon samples from Taal Lake had the highest mean body weight, mean body length and gonadosomatic index compared to stocks from Candaba, Laguna Lake and Sampalok Lake. Induced spawning trials were also made. Spawning eggs had mean fertilization rates of 53-86% and hatching rate of 23%. Eggs incubated in mildly aerated water at 28-30°C hatched about 11-13 hrs. post-fertilization.

To support the need for growing silver therapon hatchlings, two candidate larval food species (*i.e.* protozoan and small algal species) are being cultured to evaluate their potential as food for first feeding larvae of silver perch. Those grown in lake-based net cages had similar mean body weights when fed trash shrimp feed or commercial prawn feed. Growth was higher for both treatments than the unfed control.

The study on Manila sea catfish farming in cages has been discontinued due to difficulty in the procurement of wild stocks.

Implement health management strategies for culture of freshwater species

Another study started is on the identification and control of freshwater and marine fungi affecting *Macrobrachium* spp. broodstock and larvae. Fungi isolated from incubating eggs and infected larvae of *M. rosenbergii* were characterized and identified based on their morphological attributes. Three of four isolates have characteristics that classify them under genus *Lagenidium*.

Develop and implement business packages for Freshwater aquaculture

There is no on-going SEAFDEC-assisted project on any freshwater aquaculture species this year under the ABOT (Agree-Build-Operate-Transfer) AquaNegosyo Program. However some preliminary inquiries from potential clients were received for assistance under ABOT.

Other studies

A new study being co-funded by ACIAR has recently commenced and this shall focus on the carrying capacity, decision support tools for freshwater systems in Australia and the Philippines. Results generated from this research will be beneficial particularly for setting policies in the sustainable management of freshwater systems (like the Laguna Lake) which are used for aquaculture.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning for the Program Activities

- Most of the studies which were started in 2010 shall be continued in 2011 except for the studies on: a) the reproductive biology of the silver therapon *Leipotherapon plumbeus*; b) cage farming of silver therapon in Laguna de Bay; and c) grow-out culture of Asian catfish *Clarias macrocephalus* in netcages in Laguna de Bay which shall be completed in December.
- Several new studies particularly on indigenous species will be pursued. Production activities particularly those of advanced bighead carp fingerling production and giant freshwater prawn seedstock production shall be continued.
- Training activities on freshwater aquaculture species shall be pursued and plans to forge collaboration with a local farm school (Farm Business Institute) to conduct training activities for human capacity building in small-holder freshwater aquafarming is being considered.

4.2. Expected Outcomes of the Proposed Projects/Activities

The outputs from thirteen proposed research and technology verification studies (refer to tabulated list below) in 2011 shall continue to generate information that will address the objectives set under the program and will allow for the development of technologies that will further support rural development and livelihood through freshwater aquaculture.

Commodity	Research title
Giant Freshwater Prawn	Partial replacement of fish meal with cowpea meal in diets for postlarvae and juvenile giant freshwater <i>Macrobrachium rosenbergii</i> (de Man 1879)
	Production characteristics of the giant freshwater prawn <i>Macrobrachium rosenbergii</i> cultured in cages using different grow-out management strategies
	Mass production of freshwater prawn post-larvae using green water system
	Genetic improvement in the giant freshwater prawn, <i>Macrobrachium rosenbergii</i> (I) Development of effective broodstock management schemes for improved growth and reproductive performance
	Development of low pollution diets for freshwater prawn broodstock
Bighead Carp	Freshwater aquaculture seedstock production in Laguna de Bay I. Advanced bighead carp fingerlings production in a small fishpen
Tilapia	Selective breeding for enhanced traits in saline-tolerant tilapias (<i>Oreochromis</i> spp). I. Growth, survival and fillet yield of Mozambique tilapia, commercial tilapia hybrids and saline-adapted Nile tilapia in brackishwater conditions
	Net cage culture of tilapia and freshwater prawn in freshwater dam/reservoir using SEAFDEC and commercial feed

	Mass production of <i>Oreochromis niloticus</i> and red tilapia (<i>old title</i> : Mass production of catfish native, catfish-hybrid and tilapia (red tilapia and Nile tilapia))
Indigenous species	Larval rearing of the silver perch <i>Leiopotherapon plumbeus</i> (Kner, 1864) under laboratory condition
	Breeding of climbing perch <i>Anabas testudineus</i>
	Domestication and evaluation of the culture potential of native Caridean prawns: <i>Macrobrachium lar</i>
Others	Carrying capacity, decision support tools for freshwater systems in Australia and the Philippines

PROGRAM DOCUMENT

Program Category: Departmental Program
Program Title: Seaweed Strain Improvement
Responsible Department: SEAFDEC Aquaculture Department
Duration of the Program: 2008-2010

1. INTRODUCTION

Seaweed industry gives high revenue to the national economy and also provides livelihood to marginal fisherfolks. However, problems of the industry at the production level, mainly, the decreasing seaweed production, should be addressed to make seaweed farming sustainable. This problem is due to poor quality seeds stocks.

Seaweeds nourish by absorbing nutrient from the environment. Nutrients, *i.e.* nitrogen compounds, that are toxic at certain levels to animals, are beneficial to seaweeds. *Gracilaria* thrives in conditions that are high in organic load. Thus the *Gracilaria* is used as biofilter. The use of *Gracilaria* as biofilter will be tested with shrimp.

Seaweeds as source of natural products as nutraceuticals, pharmaceuticals, for biomedical and food products (binder, stabilizers etc.) is being studied here and other parts of the globe. In aquaculture, the use of seaweeds as an antimicrobial for fish will be explored.

2. OBJECTIVES

- 1) Develop new strains of *Kappaphycus*
 - Strains that are fast growing, with good quality *carrageenan*, and less susceptible to diseases
 - Establish genetic markers of stocks and releases
 - Mass produce good quality seedlings
- 2) Improve the efficiency of *Gracilaria* (other seaweeds) as biofilter
 - Determine the nutrient uptake kinetics and assimilation of *Gracilaria*
 - Determine the output of shrimp (excreta, urine, uneaten feeds etc.) at different stages
 - Determine efficiency of *Gracilaria* as biofilter in the shrimp tank and pond culture
- 3) Explore anti-microbial properties of seaweeds of commercially-important seaweeds against common fish (and human) pathogens
 - Identify seaweed strains that have anti-bacterial or anti-viral activity against pathogenic micro-organisms of fish
 - To test the toxicity of crude seaweed extracts in fish cell lines

3. PROGRAM DESCRIPTION

The Program deals primarily with the problem of deteriorating quality of cultivars consequently resulting to a reduced production and productivity of the seaweed farmers. Two strategies are done to address this problem, these are: 1) tissue culture and mutagenesis; and 2) natural sporulation.

4. PROGRESS OF ACTIVITIES IN THE YEAR 2010

Develop 'new' and improved varieties of *Kappaphycus*

Seaweeds from spores were grown in the farm and being evaluated for its growth performance. Protoplasts were isolated using combinations of cell-wall lytic enzymes. Fresh abalone and

Acetone powder in combination with cellulase enzyme mixture showed high density of protoplast isolated. Temperature highly affected the density of protoplast isolated. No protoplast was isolated when tissues were incubated below 26°C.

Extraction of *Kappaphycus* DNA was optimized. DNA was extracted from different sources. Primers were designed and ready for testing.

Improve the efficiency of *Gracilaria* (other seaweeds) as biofilter

To determine the potential of *P. indicus* - *C. racemosa* polyculture in pond, salinity tolerance test was conducted. *C. racemosa* can withstand salinities as low as 20 ppt. Lower than 20 ppt, *C. racemosa* thalli disintegrated after 4 days of continuous culture in low salinities. In addition, preliminary experiment in 50-l tank showed that *P. indicus* juvenile stocked at 0.5 ind l⁻¹ in tanks containing 6 kg ton⁻¹ *C. racemosa* can be maintained without water change for 23 days, while those stocked at lower stocking densities of *C. racemosa* needed to be changed after 10 days. Shrimps eat epiphytes growing in the tanks as well as young rhizoid of *C. racemosa* for nitrogen analysis were collected and ready for analysis.

Experiment on the stocking density (2, 4, 6, 8, 10 and 12 kg ton⁻¹) of seaweed *C. racemosa* harvested from the raceway was undertaken in 50-l tank under semi-outdoor conditions. Results showed that *C. racemosa* grows slower in the first week of culture with specific growth rate (SGR) ranging from 2.3–6.5% day⁻¹ with the highest SGR obtained in 8 kg ton⁻¹. Longer cultivation (21days) yielded SGR ranging from 14.0–19.6% day⁻¹ with highest obtained in 6 kg ton⁻¹. Salinity, temperature and pH during the experiment ranged from 30-31 ppt, 27-29°C, 8.0-8.5, respectively.

Ammonium and nitrate uptake of *C. racemosa* was investigated. *C. racemosa* (50 g) was added into aquaria containing 1-10 ppm NH₃Cl and 0.1-5 ppm NaNO₃ at controlled light intensity of 33 photon μmol m² sec⁻¹. Water samples were taken at 0, 30min, 1h, 2h and 3h after the addition of seaweed. Water samples were analyzed.

Explore the microbial properties of commercially important seaweeds against common fish (and humans) pathogens

Available *Kappaphycus* and *Eucheuma* at the seaweeds laboratory were used in this study. Cellular materials were extracted using acetone and water. Extraction using acetone was optimized. Extraction using water is being optimized. The extract will be used to test viruses and bacteria propagated in cell-lines. Cell-lines were requested from different sources. SEAFDEC cell-lines will also be tested.

5. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

5.1. Planning of the Project Activities

- Protoplast and spores of *Kappaphycus* (different varieties) will be crossed to produce hybrids with good quality
- Bioremediation design for *Caulerpa/Gracilaria* for shrimp culture in tanks
- Testing for antimicrobial activity of seaweed extracts for WSSN, VNN etc

5.2 Expected Outcomes

- Good quality seedlings
- Improved water quality in intensive shrimp culture
- Product from seaweeds that can prevent viral and/or bacterial infection of aquaculture commodities

PROGRAM DOCUMENT

Program Category: Departmental Program
Program Title: Aquatic Ecology
Responsible Department: SEAFDEC Aquaculture Department
Duration of the Program: 2008-2012

1. INTRODUCTION

The extensive use of estuarine and coastal waters for aquaculture has contributed to the degradation of water and soil quality. There is a need for aquaculture technologies that recognize the importance of ecosystem approaches and suitable operating procedures. The concept of carrying capacity of the aquatic environment can be used as a strategy to alleviate, if not prevent coastal pollution brought by aquaculture activities.

2. PROGRAM

2.1. Objectives

To generate aquaculture technologies with the least possible negative impact on the environment.

2.2. Program Description

The aquatic ecology program continuously monitor the impacts of aquaculture activities on the environment, establish information on interactions and the balance between farmed species and natural diversities, and make use of bioremediators to lessen aquaculture wastes.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

Assess the impacts of aquaculture on the environment

The preliminary findings of the experiment using *Anodontia philippiana* and *Holothuria scabra* as bioremediators in an intensive cage culture system showed that sulfide is higher beneath the cages (0.018-1.34 ppm) than in the control area without cage.

Also, an *in situ* experiment was conducted to determine sulfide tolerance of sea cucumber. Results from this will be used to redesign the experiment. Decrease in nutrients marked the start of partial harvesting of milkfish or limited feeding in some cages due to limited funds. The trends in highs and lows of the parameters measured may be attributed to the amount of excess feeds and fecal matter deposited in the bottom of the cages. Nitrate and nitrite concentrations were highest in the control where ammonia was observed to be the lowest. The control is an open area where oxygen is not limiting. The control also showed to have significantly lower ammonia, phosphate and sulfide concentrations as compared to the four milkfish cages. Temperature, salinity, pH and DO did not significantly differ among the four cages although there were significant differences between sampling periods.

In situ testing of sandfish tolerance to sulfide showed that at a mean sulfide concentration of 3.17-5.79 ppm from 0 to 36 hour, a 5% mortality was observed on the 12th hour. More than 50% mortality was observed after 24 hours and 91% by the 48th hour. The experiment was terminated on the 54th hour with 98% mortality.

Assess the impacts of different pond practices on biodiversity in ponds and adjoining mangroves and shores

This research 'rides on' the ongoing technology verification projects at Dumangas Brackishwater Station (DBS). Between December 2009 and March 2010, ponds were harvested and totally drained and the by-catch (non-crop) species were obtained for identification and enumeration. Results showed a very high diversity of non-crop species (fishes, crustaceans, mollusks, echinoderms) that grew in the DBS ponds and participated in the food web in ponds. Some 87 species of fishes in 45 families were found in the ponds. Eight were crop species, and the others naturally seeded by the tides and later harvested as by-catch.

An exhibit of specimens of biodiversity will be set up in August. In March, five students from the University of the Philippines High School (UPHSI) finished their thesis on the mangroves and mollusks in the fenced DBS greenbelt. Another five UPHSI students will be supervised do their thesis on the fishes and crustaceans in the mangroves near DBS.

Develop bioremediation measures to mitigate negative impacts of aquaculture to the environment

Preliminary study was conducted to test the suitability of snapper (*Lutjanus argentimaculatus*) for combined culture with sandfish. Results were positive, as all fish and sandfish survived and were in good condition after the one week trial.

A one-month run was also conducted with pompano juveniles, looking at the effects of sandfish size at stocking, as well as different sandfish:fish ratios. The one-month experiment was also conducted with sandfish and the shrimp *Penaeus indicus*. This experiment is still ongoing, however initial results indicate that high densities of *P. indicus*, regardless of size, seems to be detrimental to the sandfish, resulting in heavy mortalities.

The study was also initiated to determine the optimal conditions for growth and survival of sandfish juveniles for culture. The experiment on the substrate preference of sandfish is on-going.

Evaluation of the combined culture of sandfish *Holothuria scabra* and black tiger prawn *Penaeus monodon* in cages in mangroves was initiated. Cages were stocked with prawns only, prawns and sandfish, and sandfish only. Preliminary results showed that mean weight of sandfish doubled from 4.5 to 8.7 g after 2 weeks but survival was low. No growth was observed in prawns but results are promising since they were not affected by white spot virus despite the wide occurrence of the virus in the adjacent ponds. Observation on water quality showed that levels of sulfide and phosphate concentration increased after 2 weeks culture. Ammonia level in cages also increased after two weeks but decreased by 0.45 ppm in cage with sandfish only.

A study that determines the social acceptability of marine cage culture as a livelihood option for fishers affected by oil spill in four coastal barangays in Nueva Valencia, Guimaras was continued. A survey of participant fishers in the SEAFDEC/Petron/LGU collaborative project was done to get a comparative view of acceptability of cage culture between participant and non-participant fishers. Initial in-depth interview of key informants indicated that cage culture is socially and economically acceptable. They also believe that the negative impact of aquaculture to the environment can be addressed appropriately if cage culture is managed effectively and efficiently. Data collected from the household survey have yet to be encoded.

4. PROPOSED ACTIVITIES FOR THE YEAR 2011

4.1 Planning for the Program Activities

The following studies will be continued to help address the problems caused by aquaculture to the environment:

1. The use of “*Anodontia philippiana* and *Holothuria scabra* as bioremediators in an intensive cage culture system”. Side studies on sulfide and low dissolved oxygen tolerance of experimental animals will be conducted prior to the actual run of the multitrophic culture system using milkfish cages in Igang Marine Station (IMS).
2. Biodiversity in marine cages and platforms for aquaculture in Guimaras: species composition and abundance in relation to locality, duration of immersion, and farm management.
3. Investigation on sea cucumber stocking size and stocking densities using sea bass, milkfish, and possibly snapper as main commodities; completion of full production cycle of grow-out studies in ponds at DBS and pens at IMS using the finfish species identified as the best candidate based on previous studies done in tanks.
4. Experiment to design grow out culture system for prawn and sandfish in mangroves.
5. Continuation of survey of non-fishers to get the views of the community on the acceptability of cage culture as livelihood option for fishers.

Annex 5

PROGRAMS UNDER THE FISHERIES CONSULTATIVE GROUP OF THE ASEAN-SEAFDEC STRATEGIC PARTNERSHIP (FCG/ASSP) MECHANISM 2010-2011

Project Titles	Responsible Department	2010	2011
1. Assistance for Capacity Building in the Region to Address International Trade-related Issues	SEC	Y	Y
2. Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region	SEC	Y	Y
3. Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea	SEC	Y	Y
4. Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in ASEAN Region	SEC	Y ⁷	N
5. Human Resource Development (HRD) for Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region	SEC	Y ⁸	N
6. ASEAN-SEAFDEC Conference on Sustainable Development of Fisheries and Food Security Towards 2020	All Dept	Y	Y
7. Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)	TD	Y	Y
8. Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses	TD	Y	Y
9. Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2	TD	Y	Y
10. Deep Sea Fisheries Resources Exploration in the Southeast Asia	TD	Y	Y
11. Information Collection of Highly Migratory Species in Southeast Asian Waters	TD	Y	Y
12. Development of Regional Database for Fishery Management	TD	Y	Y
13. Promotion of Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management	TD	Y	Y
14. Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement	TD	Y	Y
15. Chemical and Drug Residues in Fish and Fish Products in Southeast Asia: Biotoxins Monitoring in ASEAN	MFRD	Y	Y
16. Traceability Systems for Aquaculture Products in the ASEAN Region	MFRD	Y	Y
17. Utilization of Freshwater Fish for Value-added Products	MFRD	N	Y ⁹
18. Promotion of Sustainable and Region-oriented Aquaculture	AQD	Y	Y
19. Resource Enhancement of International Threatened and Over-exploited Species in Southeast Asia through Stock Release	AQD	Y	Y
20. Accelerating Awareness and Capacity-building in Fish Health Management in Southeast Asia	AQD	Y	Y
21. Food Safety of Aquaculture Products in Southeast Asia	AQD (MFRD)	Y	Y
22. Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea	MFRDMD	Y	Y
23. Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asia Waters	MFRDMD (TD)	Y	Y

⁷ The Program completed during the first quarter of 2010

⁸ The Program completed during the third quarter of 2010

⁹ The Program is transferred from the Non-funded program on “Utilization of Freshwater Fish in ASEAN Member Countries”. A proposed new title as appeared will be supported by the Government of Singapore starting from 2011 for three years under the FCG/ASSP. However, the Program activities will target only some Member Countries due to limitation of the budget.

New Programs	Responsible Department	2010	2011
1. Improvement of Information Gathering System for IUU Fishing Related Countermeasures in the Southeast Asia	TD	N	Y
2. Promotion on Fishing License, Boats Registration, and Port State Measures	TD (MFRDMD)	N	Y
3. Human Resource Development for Sustainable Fisheries	TD	N	Y
4. Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing Related Countermeasures	SEC	N	Y
List of Non-Funded Programs	Responsible Department	2010	2011
1. The Use of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region	MFRDMD	N	N
2. Development of Integrated Inland Fisheries Management in ASEAN Countries	MFRDMD	N	N
3. Utilization of Freshwater Fish in ASEAN Member Countries	MFRD	N	Y ¹⁰
4. Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty ¹¹	TD/SEC	N	N

¹⁰ In 2011, this program will be implemented with a new Title : Utilization of Freshwater Fish for Value-added Products under the FCG/ASSP mechanism operated by MFRD

¹¹ This program will be linked with the pipeline project on “Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management” preparing by TD in collaboration with SEC

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Assistance for Capacity Building in the Region to Address International Trade-related Issues
Lead Department:	SEAFDEC Secretariat
Lead Country:	Thailand
Total Duration:	2010-2012
Proposed Budget:	50,000 USD

1. INTRODUCTION

The program on Assistance of Capacity Building in the Region to Address International Trade-related Issues (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 World Trade Organization (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; Convention on International Trade in Endangered Species of Wild Fauna and Flora (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.

In 2010, several international fish trade-related issues such as CITES, fishery subsidies, aquaculture certification, and country views of EC-Regulation and Port State Measures are identified by Member Countries.

2. PROGRAM

2.1 Objectives

The overall objectives of the projects are as follows:

- 1) Monitor and review the potential international fish trade and environmental task-related issues;

- 2) Identify and analyze the potential impacts of international fish trade and environmental task-related issues to the sustainable fisheries development in Southeast Asia; and
- 3) Developing the regional policy recommendations and the ASEAN-SEAFDEC coordinated position on the international fish trade and environmental task-related issues through the Regional Technical Consultation.

2.2 Program Description

Past to present, SEAFDEC has monitored the potential international fish trade and environmental task-related issues and provided regional technical consultative forum to the ASEAN-SEAFDEC Member Countries. Through this mechanism SEAFDEC provides fisheries authority of Member Countries with necessary information of the international concerns such as the issues under UN General Assembly, WTO, FAO and CITES as well as large group of importers like EC. The outcomes of regional discussions and conclusion were policy recommendations including the action plan as well as the ASEAN-SEAFDEC common/coordinated position of specific issues in order to safeguard the country or region's interests dealing at the global fora. Therefore, it is crucial that SEAFDEC need to keep monitoring the emerging international fish trade and environmental task-related issues, while providing support to the Member Countries through appropriate channels in order to reflect the regional collaborative efforts in managing fisheries.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activity' Achievements in the Year 2010

Activity Title	Duration	Remarks
1) International Fisheries, Trade Related Issues		
<ul style="list-style-type: none"> • In-depth Study on the International Fish Trade-related issues 	Nov 2009 - Feb 2010	<ul style="list-style-type: none"> • Secretariat conducted the in-depth study on the identified international fish trade-related issues particularly on the EC-Regulation and Port State Measure. Regarding this its impact to development of fisheries and aquaculture in the region has been reviewed through the questionnaires input by Member Countries. The outcome of questionnaires is summarized as the Report of Country's views on the EC-Regulation and Port State Measures. • Secretariat requested Malaysia for updating the present status of the negotiation process on fisheries subsidies at the WTO forum. The current Draft's Text on Fisheries Subsidies was provided for discussion at the RTC while requesting all Member Countries to provide inputs for further negotiation process. • Secretariat requested Thailand for updating the status of FAO Guideline on Aquaculture (Aquaculture Certification) and providing the relevant documents for discussion at the RTC.
<ul style="list-style-type: none"> • Organized the Regional Technical Consultation (RTC) on International Fisheries-related issues 	2-4 February 2010	<ul style="list-style-type: none"> • Secretariat organized the ASEAN-SEAFDEC Regional Technical Consultation on International Fisheries-related Issues (2010) from 2 to 4 February 2010 in Bangkok, Thailand. The Consultation was attended by national delegates from the ASEAN and SEAFDEC Member Countries, ASEAN Secretariat and senior officers from SEAFDEC Secretariat and technical Departments. The

		<p>outputs from RTC are as follows;</p> <ul style="list-style-type: none"> ▪ Executive Summary on the International Fish Trade-related Issues for 2009-2010, ▪ ASEAN-SEAFDEC Coordinated Position on proposed Aquatic Marine Species into the CITES Appendices, the position was addressed at the COP15-CITES held in Doha, Qatar from 13-25 March 2010
<ul style="list-style-type: none"> • Information dissemination from the outcome activities 	Whole period of 2010	<ul style="list-style-type: none"> • Executive Summary on the International Fish Trade Related Issues for 2009-2010 • ASEAN-SEAFDEC Coordinated Position on proposed Aquatic Marine Species into the CITES Appendices
2) Environment Task-related Issue		
<ul style="list-style-type: none"> • In-depth Study on the Aquatic Marine Species such as Sharks, Precious Corals, and Atlantic Bluefin tuna proposed listing in the CITES Appendices 	Nov 2009-Jan 2010	<ul style="list-style-type: none"> • Secretariat compiled the information on aquatic marine species such as Sharks, Precious Corals, and Atlantic Bluefin tuna that were proposed to be listed in the CITES appendices. • Secretariat conducted the regional synthesis of shark fisheries in Southeast Asian waters. The outcomes from this activity is as follows: <ul style="list-style-type: none"> ▪ Overview of Shark Fisheries in the Southeast Asian Region as a input for the <i>ad-hoc</i> Meeting of Shark experts.
<ul style="list-style-type: none"> • Organized the <i>ad-hoc</i> Meeting of Shark Experts in the Southeast Asian Region at SEAFDEC/TD, 	28-29 Jan 2010	<ul style="list-style-type: none"> • Secretariat organized the <i>ad-hoc</i> Meeting of Shark Experts in the Southeast Asian Region at SEAFDEC/TD, Samut Prakan, Thailand from 28-29 January 2010. Experts from Indonesia, Malaysia, Philippines, Thailand and Japan attended the meeting. The outcomes from the meeting are as follows: <ul style="list-style-type: none"> ▪ Technical/Policy Recommendations on Sharks fisheries in the Southeast Asian Region, this was used as inputs for drafting of the ASEAN-SEAFDEC coordinated position to reject the proposed listing of shark species into CITES Appendices. ▪ Recommendations to SEAFDEC and Member Countries for improvement of information collection and initiatives works to support management and assessment of sharks in the region.
<ul style="list-style-type: none"> • Participation to the relevant national, regional and international Fora 	13-25 March 29 June 2010	<ul style="list-style-type: none"> • SEAFDEC Senior staffs participated to the COP15-CITES in Doha, Qatar from 13-25 March 2010, with the objectives to coordinate and technical support to the responsible environment delegates from ASEAN-SEAFDEC Member Countries while promoting the ASEAN-SEAFDEC Coordinated Position. • SEAFDEC senior staff participated to the National Workshop on Review of COP15-CITES and Preparatory discussion for the forthcoming COP16-CITES which will be hosted by Environment Agency in cooperation with DOF-Thailand in 2013. In this regards, Secretariat introduced a paper on the Study on Sustainable Utilization of Aquatic Fisheries Resources to Mitigate the impact from CITES issues.

<ul style="list-style-type: none"> Information dissemination from the outcome activities 	<p>Throughout of the year</p>	<ul style="list-style-type: none"> Overview of Shark Fisheries in the Southeast Asian Region Technical/policy Recommendations on Sharks fisheries in the Southeast Asian Region Recommendations to SEAFDEC and Member Countries for improvement of information collection of sharks E-news from COP15-CITES to update the outcomes from negotiation process Presentation of the Study on Sustainable Utilization of Aquatic Fisheries Resources to Mitigate the impact from CITES issues.
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3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Theme: Addressing the International Fish Trade-and Environmental Task-related Issues</p>
<p>(2) Issues in the region at the beginning of the study:</p> <ul style="list-style-type: none"> Several International Measures/pressures affecting to national policy management of fisheries and aquaculture in the Region Needs of the Capacity Building of ASEAN country to address the International fish trade-and environmental task-related issues at the International Fora Information sharing on the fish trade and environmental task related issues Adaptation of the fishery policy/management dealing with or meeting with the International Measures Requirement of the regional approaches and positions to safeguard regional interests related to fisheries

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> Country's capability to share and address their voice/opinion on the International fish trade and environmental task-related issues at the international fora The ASEAN-SEAFDEC Common Positions or Coordinated Positions on specific issues dealing with international measures Participation to the International For a on Fish Trade-and Environmental Task-related Issues

3.2.3 "Steps" toward achieving final goals:

<p>Step 1: In-depth study on the international fish-trade and environmental task-related issues</p>
<p>Step 2: Organizing the Regional Technical Consultation to develop the Regional recommendation or ASEAN-SEAFDEC Coordinated positions If required, the expert meeting on particular issues shall be convened, in order to analyze/compile for technical recommendation.</p>
<p>Step 3: Participation to the International/Regional and National forum to promote, update, and share the Regional views/interests related to sustainable development of fisheries and aquaculture.</p>
<p>Step 4: Information Production and Dissemination</p>

3.2.4 Activities in the current program:

<p>(1) Current position of the program: One year cycle</p>
<p>(2) Program duration: 2010-2012 <under the new framework from 2010></p>
<p>(3) Main activities: -</p>

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> • In-depth Study on the International Fish Trade-related issues for Inputs at the RTC • Organized the RTC on International Fish Trade-related issues with the main aims to develop the ASEAN-SEAFDEC Coordinated Positions • In-depth Study on the Aquatic Marine Species such as Sharks, Precious Corals, and Atlantic Bluefin tuna that were proposed to be listed to CITES appendices at the COP15-CITES • Organized the <i>ad-hoc</i> Meeting of Shark Experts in the Southeast Asian Region • Participated to the COP15-CITES in Doha, Qatar • Participate and present a paper on Study on Sustainable Utilization of Aquatic Fisheries Resources to mitigate the impact from CITES at the National Workshop on Outcome's Review of COP15-CITES and Preparatory Discussion for the COP16-CITES • Information production and dissemination 	
(2) Main achievements till the end of 2010 (tentative)	
<ul style="list-style-type: none"> • Executive Summary on the International Fish Trade-related Issues for 2009-2010 • ASEAN-SEAFDEC Coordinated Position on proposed Aquatic Marine Species into the CITES Appendices • Overview of Sharks Fisheries in the Southeast Asian Region • Technical/Policy Recommendations on Sharks fisheries in the Southeast Asian Region • Recommendations to SEAFDEC and Member Countries for improvement of information collection of Sharks • E-news from COP15-CITES to update the outcomes from negotiation process • Presentation of the Study on Sustainable Utilization of Aquatic Fisheries Resources to Mitigate the impact from CITES issues. 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)	
Expected outcomes	Achievement rate (%)
<ul style="list-style-type: none"> • Country's capability to share and address their voice/opinion on the International fish trade and environmental task-related Issues at the international fora 	100
<ul style="list-style-type: none"> • The ASEAN-SEAFDEC Common Positions or Coordinated Positions on specific issues dealing with International Measures 	100
<ul style="list-style-type: none"> • Participation to the International Fora on Fish Trade-and Environmental Task-related Issues 	50

3.2.6 Evaluation of Program activities in 2010

<ul style="list-style-type: none"> • SEAFDEC policy on participation of SEAFDEC to the International for a related to fish trade, environmental task and others related to fisheries should be strengthened, as it is a way to update and involve in the process of any development of measures which might be concerned to the development of fisheries in the Region. In additional, the information sharing can be given to all Member Countries for further discussion dealing with any new emerging issues/measures. • To support MCs on addressing and developing any National Plan of Action (NPOAs) such as NPOA-IUU fishing, NPOA-shark which are related to International measures, in this context SEAFDEC need to play more important role to advise and support member country in developing process.
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4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

Proposed future activities for the year 2011 are not difference of the year 2010, Main activities will be same as follows:

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1: International Fisheries, Trade Related Issues		
1.1 In-Depth Study on the specific issues identified by the Member Countries	Nov. 2010- Feb.2011	
1.2 Regional Technical Consultation on International Fish Trade-related issues	Feb. 2011 (3 rd week)	
1.3 Participation to Relevant International Fora; • FAO COFI • 3 rd Regional Bodies Secretariat Networks, • Others (to be identified later)	Jan-Dec 2011	
1.4 Production of Promotional brochure and materials for Support the Member Countries	Jan-Dec 2011	
Activity 2: Environmental Task related Issues		
2.1 Monitoring and Participation to Inter' International/ Regional and national meetings related to CITES	Jan-Dec 2011	
2.2 Regional Expert Meeting on CITES species	No activity	
2.3 Regional Synthesis and In-Depth Study on concerned species	May-Dec 2011	
2.4 Production of Promotional brochure and materials for Support the Member Countries	July-Dec 2011	

4.2 Expected Outcomes in the Year 2011

<ul style="list-style-type: none"> • Country's capability to share and address their voice/views on the International fish trade-and environmental task-related issues at the international/regional fora • The ASEAN-SEAFDEC Coordinated Positions on specific issues dealing with International Measures • Participation to the International For a on Fish Trade-and Environmental Task-related Issues
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PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region: Towards Better Utilization and Harmonized Information for Fisheries Management in Southeast Asia
Responsible Department:	SEAFDEC Secretariat
Lead Country:	Thailand
Total Duration:	2007-2012

1. INTRODUCTION

It is well recognized that 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 databases 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. In addition, SEAFDEC have also been implementing projects related to data and information for fisheries management *i.e.* Information Collection of Highly Migratory Species in Southeast Asia Waters, Fisheries Resources Survey, Deep Sea Fisheries Resources Exploration in the Southeast Asia, Development of Regional Database for Fisheries Management, Research for Stock Enhancement of Sea Turtles, Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea, the Use of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region, and SEAFDEC-Sida projects initiatives relevant to fisheries information and statistics, etc.

Under the 3-year ASEAN-SEAFDEC FCG program on Fishery Statistics and Information supported by the Japanese Trust Fund (2007-2009), the program achievements were accomplished with the development of Regional Framework for Fishery Statistics of Southeast Asia, comprising standard definitions, and classification of fishery statistics and information; Streamlined Reporting of Fishery Statistics from the Member Countries to FAO and SEAFDEC; and development of National Status and Trends of Fisheries (STF) and Aquaculture (STA) to enhance capacity of the Member Countries in development, integration, and maximizing usage of data and information available for development planning and management of fisheries. In addition, there are number of sets data and information including databases developed as the results from previous SEAFDEC's projects implementation.

Currently SEAFDEC is continuing implementation 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, including development of databases as tools 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.

More importantly, to support the implementation of the Regional Advisory Committee on Fisheries Management (RAC) in providing technical/scientific advice to the SEAFDEC Council for the improvement of fisheries management in Southeast Asia, fishery information and statistics will play key important role to facilitate the review and assess the current status of the fishery resources in particular transboundary fish stocks, *e.g.* pelagic fisheries resources, the status of fishing industries in the region, as well and emerging issues required supporting data and information, etc.

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, and development of databases and interface to link fisheries information databases for fisheries management. 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 Regional Framework for Fishery Statistics in Southeast Asia;
- 3) To improve better utilization and harmonize information from projects implemented by SEAFDEC for fisheries management in Southeast Asia;
- 4) To harmonize definitions, standards, and classification of fishery statistics and information to facilitate data sharing and exchange in the region; 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.

2.2 Program Description

This program is formulated to continue strengthening support and assistance to the Member Countries to address these issues to better utilization and harmonized information to support development planning and management of fisheries through facilitating cooperation in the region both at national and regional levels by mobilizing data and information from various sources and projects. 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 while maintaining the linkage and cooperation in the harmonization of norms/standards definitions and classifications of fishery statistics and information at regional and international levels.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
1. Improve better utilization and harmonize information from projects/initiatives implemented by SEAFDEC for fisheries	Jan. – Dec.	<ul style="list-style-type: none"> • Supported the Member Countries in improvement of national fishery statistics and information system. • The Regional Technical Consultation on Fishery Information and Statistics in Southeast Asia was also organized from 19-21 January 2010 in Bangkok, Thailand with the objectives to: i) review the outcome

<p>management in Southeast Asia</p>		<p>and achievements in the implementation of the program on Improvement of Statistics and Information for Planning and Management of Fisheries in the ASEAN Region implemented by SEAFDEC from 2002 to 2009; ii) review and exchange the experiences of the Member Countries in the development of the National Status and Trends on Fisheries and Aquaculture (STF/STA) and recommend future direction for development of the STF/STA at the regional level; and iii) recommend areas and strategies for future development and implementation of program and activities as well as the future cooperation relevant to the improvement of fishery statistics and information development planning and management in the ASEAN Region. In addition, the Consultation would also identify the key issue and directions relevant to fishery information and statistics which would be used as input for the upcoming ASEAN-SEAFDEC Conference on “Fish for the People 2020” that will be held in June 2011.</p> <ul style="list-style-type: none"> • Continued development and improvement of the regional database on fishery statistics to facilitate data sharing, exchange and usage for fisheries management. • Continued development of interface to link SEAFDEC databases on fishery information to facilitate information sharing, exchange and usage for fisheries management.
<p>2. Harmonization of Standards/Norms, Classifications and Definitions of Fishery Statistics and Information in the Region</p>	<p>Jan – Dec.</p>	<ul style="list-style-type: none"> • Continued working on Harmonization of Standards/Norms, Classifications and Definitions of Fishery Statistics and Information in the Region and through participation in the 23rd Session of the CWP and 6th Meeting of FIRMS Steering Committee to provide inputs from the region in development and improvement of global standards and norms of fishery statistics and information to support fisheries management in collaboration with FAO and other RFMO/RFB; as well as coordination and participation with other relevant and related initiatives/activities in the region. • Participation in the 3rd Working Group Meeting on Information Collection for Highly Migratory Species to provide input in harmonization of standards and norms of fisheries statistics and information.
<p>3. Development of the Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA)</p>	<p>Jan. – Dec.</p>	<ul style="list-style-type: none"> • Development of SEASOFIA, particularly the outline and preparation of data input are going-on based on knowledge and experiences of the Member Countries in the development of the National Status and Trends on Fisheries and Aquaculture (STF/STA) and recommendations for future direction for development of the STF/STA at the regional level.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Theme: Towards Better Utilization and Harmonized Information for Fisheries Management in Southeast Asia</p>
<p>(2) Issues in the region at the beginning of the study: The project started in 2007. Considering international and regional initiatives and concerns which also having impact to sustainable development of fisheries in Southeast Asia, this project then formulated to continue providing assistance to the Member Countries to address these issues to better utilization and</p>

harmonized information to support development planning and management of fisheries through facilitating cooperation in the region both at national and regional levels by mobilizing data and information from various sources. The project then developed new approach that build on top based on past achievement and experiences in supporting Member Countries and develop the linkage/coordination and integration of existing data and information, including SEAFDEC's projects for maximizing its utilization for planning and management of fisheries at national and regional level.

3.2.2 Expected final goals of the program:

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 through:

- Improve utilization and harmonized information from projects implemented by SEAFDEC relevant to fisheries management in Southeast Asia;
- Norms/standards definitions and classifications of fishery statistics and information better harmonized, and issues/areas of regional uniqueness and specification harmonized at regional and international levels; and
- Develop the Status and Trends of Fisheries and Aquaculture (STF/STA) in Southeast Asia.

3.2.3 “Steps” toward achieving final goals:

Step 1: Review existing available and on-going development of data and information, and databases from SEAFDEC projects relevant to fisheries management

- To clarify and identify problem and constraints and recommend areas need to develop the linkage and coordination and find ways and means to utilization of data and information in harmonized/integrated ways for management purposes.
- To coordinate participate in the Consultations/Meeting of SEAFDEC Projects relevant to data and information for fisheries management for providing inputs and framework for developing the linkage and coordination for better utilization of data and information in harmonized/integrated ways for management purposes.

Step 2: Harmonize definitions, standards, and classification of fishery statistics, data and information to facilitate data sharing and exchange in the region, coordination with relevant Global and Regional initiatives/fora

- Review data and information to support fisheries management relevant to Global and Regional initiatives/fora
- To coordinate and participate in the international development of standards/norms, classification and definition for fishery statistics and information, and fisheries information system at the international level *i.e.* 23rd Meeting of the Coordinating Working Party on Fishery Statistics (CWP) and the 6th Meeting of the Fisheries Resources Monitoring System (FIRMS) Steering Committee in order to reflect regional requirement, uniqueness and specificity of fisheries in the region, as well as to harmonize with on-going and development of regional and national development.

Step 3: Development of the Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA)

- Publish the Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA) mobilizing inputs and outputs from Step 1 and Step 2.

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1, 2 and 3

(2) Project duration: 2007-2012

(3) Main activities:

- Improve better utilization and harmonized information from projects implemented by SEAFDEC for fisheries management in Southeast Asia
- Harmonization of Standards/Norms, Classification and Definition of Fishery Statistics and Information in the Region
- Develop the Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA)

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> • Development of National Status and Trends of Fisheries and Aquaculture in 3 pilot countries (Philippines, Thailand and Indonesia) • Streamlined Reporting of Fisheries Statistics from the Member Countries to SEAFDEC and FAO • Development of the new Framework for Fishery Statistics and Information of Southeast Asia 	
(2) Main achievements till the end of 2010	
<ul style="list-style-type: none"> • Enhanced 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 in the development of national Status and Trends of Fisheries and Aquaculture. • Streamlined line Reporting of Fisheries Statistics from the Member Countries to SEAFDEC and FAO • Framework for Fishery Statistics and Information of Southeast Asia • Fishery Statistics and Information: Issues, Challenges and Ways Forward for Future Cooperation (including proposed inputs for the ASEAN-SEAFDEC “Fish for the People 2020 Conference” as <i>Appendix I</i>) 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010	
Expected outcome	Achievement rate (%)
<ul style="list-style-type: none"> • Improve utilization and harmonized information from projects implemented by SEAFDEC relevant to fisheries management in Southeast Asia 	50%
<ul style="list-style-type: none"> • Norms/standards definitions and classifications of fishery statistics and information better harmonized, and issues/areas of regional uniqueness and specification harmonized at regional and international levels; and 	70%
<ul style="list-style-type: none"> • Regional database for fishery statistics for Southeast Asia 	75%
<ul style="list-style-type: none"> • Interface of SEAFDEC database for fisheries management; and 	40%
<ul style="list-style-type: none"> • Develop the Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA) 	50%

3.2.6 Evaluation of Program activities in 2010

<p>Activity1: The project has improved 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 develop the linkage/coordination and integration of existing data and information for maximizing utilization for fisheries management</p> <p>Activity2: The project has maintaining the effective utilization and harmonization of norms/ standards definitions and classification of fishery statistics and information at regional and international levels.</p> <p>Activity3: The project has developed the National Status and Trends of the Fisheries and Aquaculture (STF/STA) as well as improved the fishery statistics and information development planning and management in the region</p>

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

Activity 1: Improve better utilization and harmonize information from projects/initiatives implemented by SEAFDEC for fisheries management in Southeast Asia

The current implementation of activities and outcomes from a number of collaborative programs/projects and initiatives related to data and information on fisheries in the region by SEAFDEC were 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. To support the Member Countries in improving data and

information as tools for development planning and management of fisheries, this project will lead in coordination and harmonization of framework/standard/norms for data collection and analysis; collating data and information to be shared and exchanged through development of linkage and coordination of data and information for management and participation to the Consultations/Meetings of relevant projects and mobilize data and information for development of interface of all databases from SEAFDEC projects as tools for fisheries management; as well as mobilizing those data and information as input for the Status and Trend of Fisheries and Aquaculture in Southeast Asia.

Expected Outcomes

- Maximizing usage of data and information for effective planning and management from various SEAFDEC projects and supporting RAC; and
- Interface to link of all databases relevant to fisheries information for fisheries management developed from SEAFDEC projects at the homepage as tool for fisheries management.

Activity 2: Harmonization of Standards/Norms, Classifications and Definitions of Fishery Statistics and Information in the Region

To reflect regional uniqueness and specificity of fisheries in the region to support fisheries management relevant to Global and Regional Initiatives/fora; as well as to harmonize with on-going and development of regional and national development, SEAFDEC needs to continue participation in the international development of standards/norms, classification and definition for fishery statistics and information for fisheries management at the international level *i.e.* the Intersessional/Session of 24th Meeting of the Coordinating Working Party on Fishery Statistics (CWP) and the 7th Meeting of Steering Committee of the Fisheries Resources Monitoring System (FIRMS).

Expected Outcomes

- Norms/standards definitions and classifications of fishery statistics and information better harmonized, and issues/areas of regional uniqueness and specification harmonized at regional and international levels; and relevant data and information for fisheries management relevant to other Regional and Global initiatives coordinated with input from the region and to support the region in the implementation.

Activity 3: Development of the Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA)

This activity aimed to develop the Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA) as basis for development planning and management of fisheries of the region, mobilizing experiences and lessons learnt and directions from project activities on development of National Status and Trends of Fisheries and Aquaculture for 3 pilot countries implemented during 2007-2009, and coordinated work and involvement in data and information from SEAFDEC's projects relevant to fisheries management. This SEASOFIA will present status and trend of fisheries resources and clarifying emerging issues important of the region for future consideration and direction to be tackled.

Expected Outcomes

- Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA)

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1. Improve better utilization and harmonized information from projects implemented by SEAFDEC for fisheries management in Southeast Asia	Jan – Dec	<ul style="list-style-type: none"> • Coordination and harmonization of framework/standard/norms for data collection and analysis through coordination of work and participation in the Consultations/Meetings of relevant initiatives/projects to provide guidance and framework for data collection, collation and utilization for fisheries management; • Continue to develop, maintain and improvement of the regional fishery statistics database and collating data and information to facilitate the sharing and exchange for management in the region; • Continue development of linkage and coordination of data and information for fisheries management through development of interface of databases from SEAFDEC projects/initiatives as tools for fisheries management; and • Mobilizing available fisheries data and information as input for the Status and Trend of Fisheries and Aquaculture in Southeast Asia.
2. Harmonization of Standards/Norms, Classification and Definition of Fishery Statistics and Information in the Region	Jan – Dec	<ul style="list-style-type: none"> • Participation in the Intersessional/Session of the Coordinating Working Party on Fishery Statistics (CWP) and the 7th Meeting of the Fisheries Resources Monitoring System (FIRMS) Steering Committee in order to provide input and reflect regional uniqueness and specificity of fisheries in the region to support fisheries management relevant to Global and Regional Initiatives/fora; and to harmonize with on-going and development of regional and national development.
3. Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA)	Jan – Dec	<ul style="list-style-type: none"> • Develop Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA), through mobilizing experiences and lessons learnt and directions from project activity on development of National Status and Trends of Fisheries and Aquaculture for 3 pilot countries implemented during 2007-2009, and coordinated work and involvement in data and information from SEAFDEC's projects relevant to fisheries management.

4.2 Expected Outcomes in the Year 2011

<ol style="list-style-type: none"> 1. Maximizing usage of data and information for effective planning and management from various SEAFDEC projects/initiative, supporting RAC as well as ASEAN initiatives; 2. Interface to link databases relevant to fisheries information for fisheries management developed from SEAFDEC projects/initiatives at the homepage as tool for fisheries management; 3. Norms/standards definitions and classifications of fishery statistics and information better harmonized, and issues/areas of regional uniqueness and specification harmonized at regional and international levels; and relevant data and information for fisheries management relevant to other Regional and Global initiatives coordinated with input from the region and to support the region in the implementation; and 4. Status and Trends of Fisheries and Aquaculture in Southeast Asia (SEASOFIA).

FISHERY STATISTICS AND INFORMATION: ISSUES, CHALLENGES AND WAYS FORWARD FOR FUTURE COOPERATION

I. BACKGROUND AND RATIONALE

Knowledge of the status and trends of fisheries, not only in terms of fishery resources but socio-economic and environmental aspects, is a key to sound development policy and sustainable development of fisheries. Information on the status and trends of fisheries, obtained through routine data collection (fishery statistics) and non-routine data collection (research), is therefore essential for tracking the status and performance of the fisheries sector as well as assessing the validity of policy and management of the sector.

Fishery statistics and information is widely accepted as a tool to provide a basis and being crucial to the determination of national fisheries policies, the formulation of national management frameworks and actions or even as a basis for understanding the status and condition of fisheries resources. The need for accurate, timely and reliable statistics and information for the formulation and evaluation of fishery programs and policies has inevitable expanded manifold for development and management purpose. However, national systems of fishery statistics and information require improvement and strengthening in response to the change and dynamics of the sector as well as emerging needs and requirements for effective management of the sector.

The Code of Conduct for Responsible Fisheries (CCRF) adopted in 1995 and supplemented by the Strategies for Improving Information on Status and Trend of Fisheries (STF) and Aquaculture (STA), provides norms and guidelines in achieving responsible fisheries and the role of fishery data and information. In the ASEAN region, where the Member States are working towards realization of an ASEAN Economic Community, fisheries are regarded as an important priority sector that will play an important role in such realization. Supporting data and information in assessing the sectoral integration is of crucial importance.

With the view to support the ASEAN Member States in sustainable development of fisheries, ASEAN-SEAFDEC in collaboration with FAO and hosted by Thai Department of Fisheries organized the Millennium Conference. The main outputs of the Conference were the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region, which are regarded as regional policy framework and priority actions in achieving sustainable fisheries. Considering the role and contribution of fishery statistics and information, the Resolution indicates the need for “Strengthening of fishery statistics and maximizing their use for fisheries planning and management, as well as development of standard definitions and classifications to facilitate regional fishery statistics and information exchanges”.

In order to address the above requirement, ASEAN Member Countries in collaboration with international/regional organizations such as SEAFDEC and FAO have taken initiatives at both national and regional levels to strengthen their national fishery statistical and information systems as part of strategies in achieving sustainable development of fisheries.

II. KEY ISSUES AND CHALLENGES: ACHIEVING SUSTAINABLE FISHERIES THROUGH IMPROVED FISHERY STATISTICS AND INFORMATION

Over the past decade, progress in improving the quality of statistics and information supporting sustainable fisheries has been observed. However, changes in the fisheries situation coupled with new emerging development requirements. These requirements include initiatives supporting integration of the fisheries sector in the ASEAN Community, multilateral trade arrangements, potential impacts of extreme climates, and so on. Along this line, there is a need to identify issues

and emerging challenges for improvement of fishery statistics and information as a basis for future development and cooperation.

1. Availability and quality of statistics and information supporting policy planning and management of fisheries

Production and distribution of statistics and information supporting policy planning and management of fisheries are costly exercises. Thus careful planning and implementation of statistics and information production should be conducted particularly clarifying clear objectives and usage requirements at local, national and regional levels. Due consideration should be given to emerging requirements in response to international instruments and regional directives.

In this regard, it is crucial that fishery statistics and information systems are not developed in isolation but well integrated into national fishery development and management framework. This will ensure the relevance of fishery statistics and information as well as required resources and support to the production. Supporting capacity building activities should be identified in the whole production process – data collection, analysis and reporting.

2. Mobilization and utilization of fishery related statistics and information

Strengthening data collection is an important undertaking to ensure quality statistics and information. However, there is strong need to ensure that data collected is properly analyzed and made available in the form that addresses the need of target users.

Considering that relevant data and information related to fisheries are not produced by the national fishery agencies, efforts should be made to promote consultation and coordination among agencies concern in identifying available data and information and developing sharing mechanisms. The experiences in the development of national status and trends of fisheries (STF) and aquaculture (STA) indicate the potentials as a process of facilitating inter-agency/multiple-stakeholder coordination and collaboration as well as to consolidate existing available data and information. The STF/STA also shows potential application in the sub-regional and regional context where available data and information can be fully utilized.

3. Mechanisms for regional data and information sharing

To support sharing and exchange of data and information, there is a need to work towards harmonization of standards, definition and classification. The development of Framework for Fishery Statistics in Southeast Asia is among regional supporting initiatives to provide regional common ground for statistical sharing. The Framework also provides a basis for minimum requirements of national fishery statistical systems in developing countries. Considering that there is on-going development of aquaculture statistics and inland fisheries statistics continued updating of the Framework is needed.

In addition, to facilitate sharing and exchange of data and information, there is also a need for regional/sub-regional information systems that facilitate data inputs and presentation of data and information. Where possible, such systems should be developed by taking advantages of advancement of information technology and web-based information tools. Possibility of tapping on global information facilities such as the Fisheries Resources Monitoring System (FIRM), and D4Science could be explored.

The ASEAN Network of Fishery Statistics, which has been developed as the regional mechanisms to promote joint approaches and facilitate regional cooperation on fishery statistics and information should continue to be strengthened and engaged in future cooperation.

III. WAYS FORWARD FOR FUTURE COOPERATION

Proposed Inputs for the ASEAN-SEAFDEC “Fish for the People 2020” Conference

Inputs for Resolution

“Strengthen knowledge/science-based management and development of fisheries through mobilization of existing available statistics and information, regional data and information sharing mechanism and capacity building”.

Inputs for Plan of Action

- Further strengthen national fishery statistics and information systems as part of the national fisheries development and management framework.
- Develop and refine Regional Framework of Fishery Statistics for Southeast Asia, particularly on inland and aquaculture sub-sectors through harmonization of standards, definition and classification.
- Promote data and information sharing in response to the need for management of fisheries at the regional and sub-regional levels as well as through streamlined reporting of fishery statistics.
- Strengthen regional fishery information systems that facilitate compilation of relevant data and information required for development and management of fisheries at the regional level.

Inputs for Regional Program Supporting the Implementation of the New Resolution and Plan of Action

The following are priority areas of activity needed to support the implementation of the new Resolution and Plan of Action:

- Development of practical data collection, analysis and reporting for inland fisheries and aquaculture
- Improvement of Regional Framework for Fishery Statistics in Southeast Asia through harmonization of standards, classification and definitions on inland fisheries and aquaculture
- Support streamlined reporting of fishery statistics to FAO and SEAFDEC
- Capacity building of personnel on the above activities
- Regional coordination on fishery statistics and information initiatives
- Coordination and collaboration between ASEAN Network of Fishery Statistics and Regional/Sub-regional management cooperation mechanisms

Supporting regional references to the above activities include:

- Handbook for Collection of Statistics for Inland and Coastal Fisheries
- Regional Guidelines for Responsible Fisheries Management in Southeast Asia (Fishery Statistics)
- Framework of Fishery Statistics in Southeast Asia

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Activities Related to Climate Change and Adaptation in Southeast Asia with Special Focus on the Andaman Sea
Lead Department:	Secretariat
Total Duration:	2009-2011

1. INTRODUCTION

In Southeast Asia, coastal people dependent on fish and coastal resources are facing increased hardship due to changes in the climate as well as through decreasing resources, pollution and degenerated coastal habitats/environments. Meanwhile, illegal and uncontrolled fishing is rampant in the region and concerns are raised at global, regional and national level. The management of fishing activities needs to be improved urgently in the ASEAN region in response to decline of fisheries resources and damage to coastal habitats. There is a need to control the fishing effort to address over-fishing, energy consumption and to build up adaptation abilities in the fisheries sector.

To improve coastal environmental standard and to restore and maintain natural resources, it is important to embark upon schemes that, involving relevant institutions, can safeguard against further deterioration while at the same time protect against future hazards. SEAFDEC, together with Member Countries, have been addressing issues that relates to the integration of fisheries and habitat management and the management of fishing capacity to build up a platform for long-term management responses at regional and sub-regional levels. Efforts to improve the sustainability of fisheries are being made by fisheries agencies and managers and to achieve this, it is imperative to better control the active fishing effort, both large-scale and small-scale. Furthermore, in order to improve fisheries management and to reduce illegal, unreported and unregulated (IUU) as well as destructive fishing collective regional and sub-regional arrangements and agreements are needed.

2. PROGRAM

2.1 Objectives

2.1.1 Goal/Development Objective

Long-term sustainability of fisheries reduced vulnerability to impacts of climate change and improved livelihoods of fisherfolks in the ASEAN region, and around the Andaman Sea.

2.1.2 Immediate Objectives

- 1) Capacity for the management of fisheries and important coastal habitats (*refugia*) and the protection against natural hazards built up around the Andaman Sea (integration of habitat and fisheries management).
- 2) Capacity strengthened and systems improved to monitor, record and control active fishing effort (large-and small-scale) as a basis for development for coordinated plans for management actions on fishing capacity around the Andaman Sea and among ASEAN-SEAFDEC Member Countries (to prepare for adaptive measures needed to respond to impacts of climate change).
- 3) To provide support to policy development and the process to establish a regional fisheries management mechanism and sub-regional agreements for/in the ASEAN region including reached consensus on key issues.

2.2 Program Description

In the process of implementation, four main aspects have been addressed and incorporated in the process:

- The vulnerability of poorer coastal communities to natural hazards and the risk of them being (further) marginalized during the restoration process.
- Fishing capacity.
- 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.
- Local knowledge and local organization: Several reports have pointed at the way in which certain coastal communities, based on their traditional knowledge, are facing less damage by natural hazards than other communities.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
These major events included:		
1. Consultation Meeting with the participating countries around Andaman Sea on the conduct of On-Site Training/Workshop on the Integration of Fisheries and Habitat Management and the Management of Fishing Capacity		
• Thailand	26 Feb 2010	
• Indonesia	2 Mar 2010	
• Malaysia	23-24 Mar 2010	
• Myanmar	19 Aug 2010	
2. The 2 nd Regional Technical Workshop on Safety at Sea for Small Fishing Boats at SEAFDEC/TD, Samut Prakan	20-23 Apr 2010	
3. Preparation Meeting/Survey for the Conduct of On-Site Training/Workshop on the Integration of Fisheries and Habitat Management and the Management of Fishing Capacity		
• Indonesia	3-7 May 2010	
• Malaysia	5-6 Oct. 2010	
4. On-Site Training/Workshop on the Integration of Fisheries and Habitat Management and the Management of Fishing Capacity in Medan, North Sumatera, Indonesia	19-22 Jul 2010	
5. The National Workshop on the Bay of Bengal Large Marine Ecosystem of Mergui Archipelago organized in Ranong province	13-14 Jul 2010	
6. The Expert Consultation on Managing Fishing Capacity to Combat IUU Fishing in Southeast Asia	15-17 Sept 2010	
7. The Regional Consultation on Adaptation to a Changing Environment	1-4 Nov 2010	
8. On-Site Training/Workshop on the Integration of Fisheries and Habitat Management and the Management of Fishing Capacity in Langkawi, Malaysia	23-26 Nov 2010	
9. Update information prepared on the following elements:		
• Fishing Vessel Record and Inventory		
• Institutional matrix		
• Port Monitoring		
• Managed areas (MPA's, closed areas, etc)		
• Local knowledge	Throughout the year	

<ul style="list-style-type: none"> • Climate change 		
10. Participation of events		
<ul style="list-style-type: none"> • The RTC on Fishery Information and Statistics in Southeast Asia, in Bangkok, Thailand 	19-21 Jan 2010	
<ul style="list-style-type: none"> • The 42nd Meeting of SEAFDEC Council, Lao PDR 	5-9 Apr 2010	
<ul style="list-style-type: none"> • Seminar on Ecosystem-based Adaptation (EbA): Coastal Ecosystems Role in Climate Change Adaptation, Bangkok 	3 Jun 2010	
<ul style="list-style-type: none"> • The 2nd AFCF Meeting, Brunei Darussalam 	21-25 Jun 2010	
<ul style="list-style-type: none"> • the 3rd APFIC Regional Fisheries Forum Meeting, Korea 	1-3 Sept 2010	
<ul style="list-style-type: none"> • Regional Stakeholder Forum on Directions of the MRC Strategic Plan 2011-2015, Phnom Penh, Cambodia 	20 Sept 2010	
<ul style="list-style-type: none"> • East Asian Seas Stocking Meeting, Manila, the Philippines 	28-29 Oct 2010	

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Themes:</p> <ul style="list-style-type: none"> • Capacity for the management of fisheries and important coastal habitats (<i>refugia</i>) and the protection against natural hazards built up around the Andaman Sea (integration of habitat and fisheries management) • Capacity strengthened and systems improved to monitor, record and control active fishing effort (large-and small-scale) as a basis for development for coordinated plans for management actions on fishing capacity around the Andaman Sea and among ASEAN-SEAFDEC Member Countries (to prepare for adaptive measures needed to respond to impacts of climate change) • To provide support to policy development and the process to establish a regional fisheries management mechanism and sub-regional agreements for/in the ASEAN region including reached consensus on key issues
<p>(2) Issues in the region at the beginning of the study:</p> <ul style="list-style-type: none"> • The vulnerability of poorer coastal communities to natural hazards and the risk of them being (further) marginalized during the restoration process. • Fishing capacity. • 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. • Local knowledge and local organization: Several reports have pointed at the way in which certain coastal communities, based on their traditional knowledge, are facing less damage by natural hazards than other communities.

3.2.2 Expected final goals of the program

To improve capacity and coordination for fisheries and habitat management; improve cooperation on the management of fishing capacity; and to support processes to establish regional and sub-regional fisheries and habitat management mechanisms and agreements.

3.2.3 “Steps” toward achieving final goals:

The strategy for driving this process will be to encourage and facilitate cooperation among ASEAN-SEAFDEC Member Countries, at regional and sub-regional level, around different important fisheries related issues, such as the management of fishing capacity, vessel registrations, combat IUU fishing and the mitigation of conflicts among fishers, habitat management/*refugia* or marine protected areas, information sharing and on other important aspects that will emerge such as climate change and adaptation.

Background documents are prepared and relevant resource persons mobilized to provide updated guidance also in local languages as need
Strengthen and further develop the ASEAN-SEAFDEC Cooperation.

3.2.4 Activities in the current program:

(1) Current position of the program: Not applicable as the “strategy” is based on a rolling planning schedule and “steps” worked at in parallel
(2) Program duration: 2009 -2011
(3) Main activities: <ul style="list-style-type: none"> • Integration of Fisheries and Habitat Management • Monitor, Record and Control • Local knowledge and cross-cutting issues • Policy dialogue and promotion of regional cooperation on fisheries management • Project Management and coordination

3.2.5 Progress and achievements of the current program:

Output 1: Integration of Fisheries and Habitat Management

Note: aspects related to climate change have been successfully integrated throughout, and in relation to all output groups.

Attention given into the need to apply ecosystem based approach to fisheries, the first event of On-site Training/Workshop on the Integration of Fisheries and Habitat Management and the Management of Fishing Capacity held in Medan, North Sumatera, Indonesia during 19-22 July 2010, focused on increasing awareness and sharing information on the important critical coastal habitats along the Malacca Strait among government and local fishing communities. Information on the *Rastrelliger* spp. and related species were reviewed. Management measures and restrictions on developments, construction and encroachment into sensitive habitats were presented. All local actively participated and shared information.

In July 2010, SEAFDEC-Sida project team attended the Workshop on the Bay of Bengal Large Marine Ecosystem of Mergui Archipelago in Ranong province. SEAFDEC reviewed project activities related to integration of fisheries and habitat management and information on the establishment of larger conservation area around the Andaman Sea, with collaboration with the BOBLME project. The processed initially promoted on the development of larger fisheries management and conservation areas that should be large enough to manage and to protect trans-boundary habitats and (highly) migratory species.

At the Third APFIC Regional Consultative Forum Meeting (RCFM) was co-hosted by the Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF) of the Republic of Korea and the Food and Agriculture Organization (FAO) and the Asia-Pacific Fishery Commission (APFIC) during 1 to 3 September 2010 in the Republic of Korea. SEAFDEC presented “programs on promoting of Fisheries *Refugia* and ecosystem approach”. SEAFDEC provided information on activities in collaboration with regional partner like UNEP/GEF/SCS and BOBLME project on the promotion of larger conservation area (*refugia*) in the Gulf of Thailand and the Andaman Sea, respectively.

SEAFDEC organized the Regional Technical Consultation on the Adaptation to a Changing Environment from 1-4 November 2010. Inputs from the Wetland International on the ecosystem healthy and focused the importance of mangrove forest and the need to provide capacity to local community. Numbers of recommendations were made related to climate change and adaptation.

Output 2: Monitoring, Record and Control

Through SEAFDEC events, on information sharing, such as on the number and types of boats, people involved in fishing, landings among others were addressed at regional, sub-regional and local level. A process has been initiated to develop a fishing vessel record and inventory in Southeast Asia, to promote in the development of an MCS networks and port monitoring for the Andaman Sea and initiated cooperation among the relevant countries.

A number of recommendations made at the Expert Consultation on Managing Fishing Capacity to Combat IUU Fishing in Southeast Asia held in July 2010 in Bangkok, Thailand, emphasized the need of cooperation among regional experts for the improvement of fisheries management in the region and eventually eliminate IUU fishing. Key elements such as vessel record and inventory, port monitoring, catch certification were addressed. The process has close collaboration with regional partners like APFIC, IMO as well as RPOA Secretariat and non-ASEAN Member Countries like Australia, Timor Leste.

In support of a process to develop the regional fishing record and inventory, SEAFDEC has introduced two survey forms for fishing vessel record and inventory (large-and small-scale) to the countries in the region. However, differences in systems for fishing vessel registration and for the issuing of licenses to fish (vessels, gear and people) among countries in the region, led to a difficulty in coordinating the gathering of information on registration and licenses, especially in countries with divided institutional responsibilities. Attempts should be made to “build upon the existing information based on the formats available in each country” as suggested during the Consultation. In the process however, there is a need to look into the elements of information provided in existing frameworks with a view to harmonize the formats.

Another critical element for fisheries management is to be able to provide reliable and trustworthy validation of catch documents and other required documents. It is needed to further develop catch documents that are suitable to monitor fishing activities and as a tool in tracing the fishing area, involved vessels and composition of catches.

Effective port monitoring and stringent inspections as needed from time to time to control the legality of catches being landed. The project reviewed preliminary information on the available information on the Port Monitoring in selected Southeast Asian countries in follow up on an initiative of the SEAFDEC-Sida project to monitor landings from neighboring countries. To establish and enhance port monitoring mechanisms, it is necessary to establish good cooperation among all relevant sectors and institutions, as well as among neighboring countries. It is important to recognize that during port monitoring required both local and foreign vessels are monitored to be able to validate and support the increasing requirements for catch traceability and other documentations. In the Southeast Asian region, it could be considered to establish more “sub-regions” where there are common needs to implement MCS networks to facilitate cooperation among countries in order to combat IUU fishing.

The process that has been initiated to develop MCS networks in selected sub-regions in Southeast Asia. MCS with its important sub-sets (M C and S) is an important tool in keeping track of the implementation of fisheries management plans and enforcement (combating IUU fishing). To be effective MCS system, or network, is developed based on not only the traditional monitoring and enforcement activities but also the development and management of modern data collection techniques in addition to the importance to build upon local organization and traditional knowledge to be effective at community level. A matrix on the institutional and legal arrangements in each of the countries could be useful in the process-as initiated by SEAFDEC.

At the first event of the on-site training/workshop in Medan, North Sumatera, Indonesia, the process of capacity building and raising awareness among central government and provincial level including communities initiated to provide information and better understand on the necessity of effective fishing vessel record, port monitoring, and building MCS.

At the Third APFIC Regional Consultative Forum Meeting (RCFM) in September 2010 in the Republic of Korea, SEAFDEC reviewed the importance to respond to the international agreement and measures to combat IUU fishing in Southeast Asia with emphasized on basic requirements needed to be addressed such a vessel registration, record and inventories port inspection in order to improve fisheries management in the region. Countries experiences on the implementation of EU regulation were provided. There are some points on the recommendations to APFIC and relevant organizations to take actions on continue support to the Member Countries in combating IUU fishing.

Output 3: Local Knowledge and cross-cutting issues

Through participation of local fishers and communities during the On-Site Training/Workshop on the Integration of Fisheries and Habitat Management and the Management of Fishing Capacity held from 19-22 July 2010 in Medan, North Sumatera, Indonesia, experiences were exchanged among local fishers from neighboring countries: Indonesia, Thailand and Malaysia based on their success of community involvement in fisheries management using traditional practices. Increased awareness among local fishers on importance of coastal habitats such as mangrove forest including aspects integration of fisheries and habitat management, MCS and MCS networks, vessel records, port monitoring, local/traditional knowledge, climate change and how to report in perspective that shows efforts made in response to perceived impacts of climate change.

Output 4: Policy dialogue and promotion of regional cooperation on fisheries management

Results from events like those organized by the SEAFDEC-Sida Project during 2010: 1) The Expert Consultation Managing Fishing Capacity to Combating IUU Fishing, 15-17 September 2010, in Bangkok; 2) On-Site Training/Workshop on the Integration of Fisheries and Habitat Management and the Management of Fishing Capacity, 19-22 July 2010, in Medan, North Sumatera, Indonesia; and 3) National Workshop on the Bay of Bengal Large Marine Ecosystem of Mergui Archipelago organized in Ranong province, 13-14 July 2010 have all contributed to the policy dialogue at regional and sub-regional and local levels. Based on the results and recommendations, SEAFDEC has been in the position to provide inputs and actively participate in international events organized by other organizations such as FAO/APFIC, MRC, PEMSEA, SENSEA and BOBLME. The cooperation between BOBLME projects still maintained to increase the strength of the project to look into elements of ecosystem based approaches and to integrate fisheries and habitat management around the Andaman Sea Sub-region.

- The RTC on Fishery Information and Statistics in Southeast Asia, in Bangkok, Thailand, 19-21 January 2010
- The 42nd Meeting of SEAFDEC Council, Lao PDR, 5-9 April 2010
- Seminar on Ecosystem-based Adaptation (EbA): Coastal Ecosystems? Role in Climate Change Adaptation, Bangkok, 3 June 2010
- The 2nd AFCF Meeting, Brunei Darussalam, 21-25 June 2010
- The 3rd APFIC Regional Fisheries Forum Meeting, Korea, 1-3 September 2010
- Regional Stakeholder Forum on Directions of the MRC Strategic Plan 2011-2015, Phnom Penh, Cambodia, 20 September 2010
- East Asian Seas Stocking Meeting, Manila, the Philippines, 28-29 October 2010

The special importance to the ASEAN policy dialogue and promotion of regional cooperation, project staff attended the Second Meeting of the ASEAN Fisheries Consultative Forum (AFCF) held in 21-22 June 2010, in Brunei Darussalam. Discussions were made on the promotion on sustainable fishing practices and management of fishing capacity as high priority areas. The key cluster areas for cooperation under the AFCF established so far (with lead country in brackets), include:

- Combating IUU Fishing (Indonesia)
- Promoting sustainable fishing practices
 - Fishing capacity and responsible fishing practices (Malaysia)
 - Conservation of biodiversity and enhancing fisheries resources (Vietnam)
 - Fish for aquaculture feed (Vietnam)
 - Fisheries co-management (Cambodia)
 - Adaptation and mitigation of impacts of climate change (Philippines)
 - Fisheries post-harvest and food safety (Singapore)
 - Strengthening ASEAN joint approaches/positions on international trade-related issues (Thailand)
 - Information, education and communication to support development and management of fisheries (Brunei Darussalam)
 - Capacity building (Lao PDR)

SEAFDEC has tried to build upon the role of lead countries for “key clusters” in the preparation for the consultation/expert meeting, how to build upon representatives during the meeting as well as in the process of follow up actions after the meeting. The lead countries to initially be called upon would be Indonesia (Combating IUU Fishing), Malaysia (Fishing capacity and responsible fishing practices) and Thailand (Interim Secretariat for the AFCF and lead country for the Strengthening of ASEAN joint approaches/positions on international trade related issues). Furthermore, the Philippines would be called upon in the perspective of management of fishing capacity and sustainable fishing practices to assess improvements in adaptation and mitigation of impacts of climate change (improved safety, reduced energy consumption, etc).

Output 5: Project Management and Coordination

The project has developed a working dialogue on cooperation with regional organizations and projects such as FAO/APFIC, FAO/BOBLME project, Mangroves for the Future, IUCN, ICSF, Wetland International, Wetland Alliances, MRC, etc. Consultations have been held with ASEAN and non-ASEAN Member Countries.

Furthermore, Regional Fisheries Policy Network (RFPN) Members from lead countries of relevant “key clusters”, posted at SEAFDEC Secretariat, are active in preparing for the consultation/expert meetings and in follow up to the recommendations from the meetings. In addition, they also coordinated with ensured good and direct links with the Andaman countries.

3.2.6 Evaluation of Program activities in 2010

An independent review will be made by the Swedish Board of Fisheries and a summary of their findings could be inserted here when finalized.

In summary program activities, as indicated above, has been well prepared and the program has succeeded in promoting regional and sub-regional cooperation on for the region on important issues such as IUU fishing (managing fishing capacity), the integration of fisheries and habitat management (ecosystems approach), addressing the need and opportunities to incorporate aspects of climate change into the program structure and, furthermore to strengthen capacity and awareness at local level with involvement of central and local resource persons.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

Activities for 2011 will be specified based on the results from 2010 with reference to list indicated in the project proposal sent to Sweden. In specifying activities and targets reference will be activity plans and priority indication of ASEAN, AFCF, BOBLME, APFIC/FAO, the RPOA, and Mangroves for the Future, Wetlands Alliance and SENSAs. For complete reference the whole list indicated in the project proposal to Sweden.

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p>Activities on rolling basis will be developed out of results and experiences – and the need from countries – as things develop.</p> <p>The actions will be refer to the following “output groups”:</p> <ul style="list-style-type: none"> • Integration of habitat and fisheries management • Monitoring, Record and Control – large-scale and small-scale (coastal) fishing • Local knowledge, cross-cutting issues and safety at sea • Policy dialogue and promotion of regional cooperation on fisheries management • Project Management and Coordination <p>Aspects of climate change will be integrated in all output groups as a cross-cutting matter to be considered throughout</p> <p>For detailed indicative activities see the project document</p>	<p>All outputs groups will be addressed throughout the year</p>	

4.2 Expected Outcomes in the Year 2011

<p>It is expected that the project will have made further advances in promoting regional and sub-regional cooperation on for the region on important issues such as IUU fishing (managing fishing capacity), the integration of fisheries and habitat management (ecosystems approach), addressing the need and opportunities to incorporate aspects of climate change into the program structure and, furthermore to strengthen capacity and awareness at local level with involvement of central and local resource persons.</p> <p>For more details see the project document prepared for the funding proposal. A new follow up proposal will have been prepared and sent to Sweden.</p>

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) 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:	2007-2010

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 hand, 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 fish 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 are 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 under-utilized 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 Ooita 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 Ooita 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

a. 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)”.

b. 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 2010

Project/Activity Title	Duration	Remarks
1. The Second Regional Technical Consultation on the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region	22-26 Mar 2010	<ul style="list-style-type: none"> The 2nd RTC was completely organized from 22 to 26 March 2010 in Chiang Mai, Thailand.
2. Development of the HRD Materials for Awareness Building and promotion of FOVOP in the ASEAN Region	Jan-Mar 2010	<p>The outputs as the HRD materials for the promotion of FOVOP in the ASEAN Region developed from project activities throughout the project periods in 2010 are as follows:</p> <ul style="list-style-type: none"> Policy Brief on the Promotion of “One Village, one Fisheries product (FOVOP)” in the ASEAN region: Issues, Challenges and Way forward for future cooperation, which includes Key Issues and Challenges: FOVOP Contribution to Sustainable Fisheries and Rural Economy, and proposed inputs for the ASEAN-SEAFDEC “Fish for the People 2020 Conference”. The Regional Guidelines for the Promotion of FOVOP in the ASEAN Region.
3. Preparation and submission of Project Reports	April 2010	<ul style="list-style-type: none"> The Technical Report and Financial Report of all project activities and the Financial Report were completed and submitted to the ASEAN Foundation; The Regional Guidelines for the Promotion of FOVOP in the ASEAN Region was published and dissemination to the ASEAN Countries as well as relevant Meetings for advocacy and promotion of its implementation in the region.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Theme: Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in ASEAN Region</p>
<p>(2) Issues in the region at the beginning of the study: The over-exploitation and decline of aquatic resources coupled with the lack of alternative/supplementary livelihoods in fisheries communities have constrained the sustainable development of fisheries in the ASEAN region, a situation which has led to rural poverty. Efforts have been made to explore ways and approaches to minimize further deterioration of the economic conditions of the fisheries communities by activating and improving rural economy with the view to improving the fishers’ livelihoods, alleviating poverty and contributing to the overall sustainable socio-economic development.</p> <p>The fisheries MSME sector, particularly the subsistent/marginal as well as self-sufficient/small surplus sub-sectors, is confronted with a wide-range of issues and challenges. These include the limited access to technology, micro-credit and local financial services as well as to domestic market. The insufficient entrepreneurial spirit and management skills, compounded by the lack of information, limited compliance to standards and certification, and the absence of an environment conducive to various</p>

business ventures, have also contributed to the concerns of this sector.

The ASEAN Member Countries in collaboration with SEAFDEC and the ASEAN Secretariat with funding support from the ASEAN Foundation through Japan-ASEAN Solidarity Fund, had initiated and implemented the Project on the Promotion of “One Village, One Fisheries Product (FOVOP)” System to Improve the Livelihood of the Fisheries Communities in the ASEAN Region (2007-2010). The 30-month Project introduced the adapted the “One Village, One Product (OVOP)” concept which originated from Oita Prefecture in Japan, under the context of the ASEAN region’s fisheries scenario.

3.2.2 Expected final goals of the program:

Through the experiences and lessons learnt from the Project as well as other on-going OVOP-like initiatives in the ASEAN region, FOVOP has been identified as a potential approach which could contribute to the region’s efforts in providing alternative/supplementary livelihoods to fishers and their communities through enhanced rural economy and abated poverty. In effect, fishers and their communities would be empowered in order to be actively engaged in long-term fisheries development and management processes.

3.2.3 “Steps” toward achieving final goals:

Step 1-1: Awareness Building on the promotion of FOVOP through the conduct of the First Regional Technical Consultation in March 2008 in Bangkok, Thailand. Experiences on activities similar to FOVOP in the ASEAN countries as well as that of Japan are being were exchanged on the development and promotion of FOVOP based on the experiences in Japan (One Village, One Product: OVOP), Thailand (One Tambon, One Product: OTOP), and in other ASEAN countries, and gender and development in the ASEAN region as basis for the development of appropriate strategies and guidelines for the promotion of FOVOP in the ASEAN region. In addition, the needs and problem areas related to the introduction of FOVOP in each ASEAN country were assessed, and the regional strategy on the development and promotion of FOVOP, and a regional mechanism required to support the promotion of FOVOP were developed.

Step 1-2: Identification of Potential and Problem Areas for the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region through the conduct of the ASEAN-SEAFDEC Regional HRD Workshop in August 2008 in Chiang Mai, Thailand, where project proposals for the activities to be implemented in the participating countries were formulated, which include the identified fisheries communities, potential products and services, advantages and uniqueness, detailed activities, and required inputs.

Step 2-1: Development of HRD materials for awareness and capacity building for the promotion of FOVOP in the participating ASEAN Countries. For the conduct of the local HRD activities, HRD materials prepared by regional experts with special emphasis on motivating community and local people to take leading role in the FOVOP movement as well as on the mobilization of micro-credit and marketing promotion in the rural areas, the Regional Strategy for the Promotion of FOVOP in the ASEAN Region, and Potential FOVOP Products and Services in the ASEAN region and respective country were translated by the participating countries into their respective national languages. The local languages and the translated materials were mainly used during the local HRD activities.

Step-2-2: Conducted of National HRD Workshop on the Promotion of FOVOP in 6 participating countries (Cambodia, Indonesia, Lao PDR, Myanmar, Philippines and Vietnam).

Step 3: Conclusion of project outcomes of the national HRD activities and sharing the experiences of the ASEAN countries, which would support the future national activities, identify future possible post-project activities that would be implemented later in respective countries, and adoption of the Regional Guidelines for the Promotion of FOVOP in the ASEAN Region at the 2nd Regional Technical Consultation on the Promotion of FOVOP in ASEAN Region organized in March 2010.

3.2.4 Activities in the current program:

(1) Current position of the program: Step1, 2 and 3

(2) Project duration: 2007-2010

(3) Main activities:

- 1) Preparation for the 1st Regional Technical Consultation
- 2) Organization of the 1st Regional Technical Consultation

- 3) Development of HRD activities
- 4) Preparation for the Regional HRD Workshop
- 5) Organization of the Regional HRD Workshop
- 6) Preparation of materials for local case studies
- 7) Case Studies on the Promotion of FOVOP in participating countries
- 8) Preparation of Case Studies Report by national government
- 9) Preparation for the 2nd Regional Technical Consultation
- 10) Organization of the 2nd Regional Technical Consultation
- 11) Submission of Project Report

3.2.5 Progress and achievements of the current program:

(4) Main activities conducted in the current program

- 1) First ASEAN-SEAFDEC Regional Technical Consultation on the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region (Bangkok, Thailand, 24-27 March 2008)
- 2) ASEAN-SEAFDEC HRD Workshop on Identification of Potentials and Problem Areas for the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region (18-22 August 2008, Chiang Mai, Thailand)
- 3) Development of HRD activities
- 4) HRD Workshops as Case Studies (2009-2010)
 - First ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in Cambodia (19-20 May 2009, Phnom Penh, Cambodia)
 - Second ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in Cambodia (19-21 October 2009, Battambang, Cambodia)
 - ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in Indonesia (15-19 June 2009, Semarang, Indonesia)
 - First ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in Lao PDR (23-27 March 2009, Vientiane, Lao PDR)
 - Second ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in Lao PDR (5-8 May 2009, Champasack, Lao PDR)
 - First ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in Myanmar (3-5 August 2009, Maubin, Myanmar)
 - Second ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in Myanmar (6-8 August 2009, Bago, Myanmar)
 - ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in the Philippines (24-29 August 2009, Cagayan de Oro City, Philippines)
 - ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in Vietnam (25-29 January 2010, Hai Phong, Vietnam)
- 5) Second ASEAN-SEAFDEC Regional Technical Consultation on the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region (22-26 March 2010, Chiang Mai, Thailand)
- 6) Submission of Project Report to the ASEAN Foundation

(5) Main achievements till the end of 2010

- 1) The major output of the project is the ***Regional Guidelines for the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region***. The Regional Guidelines had been developed through a series of project activities at the regional and national levels. In order to attain the objectives of the project, various preparatory and promotional works were conducted involving the government and the private sector as well as other relevant stakeholders and the relevant institutional arrangements for women in the communities. The Regional Guidelines is expected to be used as basis and enabling mechanism for the countries in the region to have clear direction and understanding for the promotion and implementation of the FOVOP approach.

The Regional Guidelines could also be used as regional reference in the national implementation of the FOVOP initiative as well as in planning for the regional support programs. Thus, the ASEAN Countries should investigate the applicability of the Regional Guidelines and be responsible for the implementation of the Guidelines. Where appropriate, the

<p>ASEAN Countries could however, make necessary adjustments of the Guidelines to fit the nature and requirements as well as the locality and specificity of the respective countries.</p> <p>The Regional Guidelines for the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region was supported and endorsed by the 18th ASWGFi, Prep-SOM-32nd AMAF and the 32nd AMAF for future promotion and implementation in the ASEAN Region.</p>	
<p>2) The Strategy for the Future Promotion of FOVOP in the ASEAN Region (Appendix 1) is aimed at providing a common framework for the countries in the region in the planning and implementation of the FOVOP approach, and subsequently in promoting cooperation between SEAFDEC, the ASEAN Countries and other Regional/International Organizations. The Strategy is also meant to enhance the implementation of the follow-up actions under the FOVOP movement.</p>	
<p>3) The Policy Brief for the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region, comprising Issues, Challenges and Way Forward for Future Cooperation (Appendix 2) was developed in order to support the adoption of the FOVOP initiative in the ASEAN Countries and regional cooperation in the future.</p> <p>The Policy Brief was supported and endorsed by the 18th ASWGFi for future promotion on FOVOP in the ASEAN Region.</p>	
<p>4) Proposed Inputs for the ASEAN-SEAFDEC “Fish for the People 2020” Conference, comprising inputs for the Resolution and Plan of Action, and inputs for the Regional Program Supporting the Implementation of the New Resolution and Plan of Action (Appendix 3).</p>	
<p>(6) Outcomes during the program period and expected achievement rate till the end of 2010</p>	
Expected outcome	Achievement rate (%)
1. Enhanced awareness on gender and development in the fishing communities, specifically clarifying the role and functions of women’s groups for the development of small-scale economic activities at the community level	100 %
2. Develop the regional strategy/guidelines on the development and promotion of “One Village, One Fisheries Product (FOVOP)” as well as the policy to support the FOVOP activities through the government services	100 %
3. Evaluated the needs and problem areas on the introduction and development of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Member Countries	100 %
4. Identified the regional mechanism required to support the promotion of “One Village, One Fisheries Product (FOVOP)”	100 %
5. Provided basis to facilitate exchange of experiences among the ASEAN Countries and experts including experience from the case studies to develop recommendations for future FOVOP activities that could be developed later, which would be suitable for each local situation in the respective ASEAN Countries.	100 %

3.2.6 Evaluation of Program activities in 2010

<p>1) ASEAN-SEAFDEC HRD Workshop on the Promotion of “One Village, One Fisheries Product (FOVOP)” in Vietnam (25-29 January 2010, Hai Phong, Vietnam)</p> <ul style="list-style-type: none"> The national HRD Workshop in Vietnam was organized at the Research Institute of Marine Fisheries (RIMF) in Hai Phong Province by the Department of Capture Fisheries and Resources Protection (DECAFIREP) in collaboration with the International Cooperation Department (ICD) of the Ministry of Agriculture and Rural development, Vietnam. It was attended by officials of DECAFIREP from Hanoi, Hai Phong, An Dinh and Da Nang Provinces as well as stakeholders from the fisheries communities of Hai Phong. The Workshop agreed on the draft Regional Strategy for the Promotion of FOVOP in the ASEAN Region which accommodated the concerned issues of Vietnam. The Workshop also confirmed the eleven potential products which were ranked as high priority by the national government of Vietnam in conjunction with the local commune committee.
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2) ***Second ASEAN-SEAFDEC Regional Technical Consultation on the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region (22-26 March 2010, Chiang Mai, Thailand)***

- In order to review the outcomes and achievements of the project as well as finalize the draft regional guidelines and strategies and develop the necessary policy brief, the Second Regional Technical Consultation was organized in Chiang Mai, Thailand. The Consultation was also used as a forum to conduct an evaluation on the promotion of FOVOP in the ASEAN Region. The second Consultation also served as the venue for sharing of the experiences gained during the pilot process implementation and the recommended future national activities, and for recommending the strategies for future promotion and implementation of FOVOP in the ASEAN Region.

Appendix 1

**STRATEGIES FOR THE FUTURE PROMOTION OF
“ONE VILLAGE, ONE FISHERIES PRODUCT (FOVOP)” IN THE ASEAN REGION**

**Strategies for the Promotion of “One Village, One Fisheries Product” (FOVOP)
in the ASEAN Region**

For the promotion of “One Village, One Fisheries Product” (FOVOP) in the ASEAN Region based on the adopted Regional Guidelines for the Promotion of FOVOP in the ASEAN Region, the following strategies were identified for future implementation at national and regional levels:

1. Raising awareness and understanding on FOVOP initiative to policy-makers of ASEAN (*i.e.* the ASEAN Sectoral Working Groups – Fisheries, Agricultural Cooperatives, SMEs Development) and SEAFDEC for their support and ensuring that the ASEAN countries implement the Regional Guidelines in their respective localities, and in promoting the adoption of the FOVOP approach in the region;
2. Mainstream FOVOP initiative into the regional policy and cooperation framework *i.e.* supporting SMEs in fisheries; and future regional policy and action programs through the ASEAN-SEAFDEC “Fish for the People 2020” Conference; and
3. Formulate project activities similar to the FOVOP movement for future promotion and implementation with possible support from the ASEAN and its dialogue partners.

**POLICY BRIEF FOR THE PROMOTION OF
“ONE VILLAGE, ONE FISHERIES PRODUCT (FOVOP)” IN THE ASEAN REGION**

PROMOTION OF “ONE VILLAGE, ONE FISHERIES PRODUCT (FOVOP)”
IN THE ASEAN REGION: ISSUES, CHALLENGES AND WAY FORWARD
FOR FUTURE COOPERATION

I. BACKGROUND AND RATIONALE

Micro-small-and medium-enterprises (MSMEs) form the backbone of the economy in the ASEAN Member States, and are the largest source of people’s livelihoods and domestic employment across all economic sectors, including fisheries. MSMEs could also provide opportunities for women and youth to participate in the economic development of the countries. Considering that a robust, dynamic and efficient MSME could ensure sustainable social and economic development, the stimulation and promotion of competitive and innovative MSMEs is critical in boosting greater economic growth of the ASEAN region.

The over-exploitation and decline of aquatic resources coupled with the lack of alternative/supplementary livelihoods in fisheries communities have constrained the sustainable development of fisheries in the ASEAN region, a situation which has led to rural poverty. Efforts have been made to explore ways and approaches to minimize further deterioration of the economic conditions of the fisheries communities by activating and improving rural economy with the view to improving the fishers’ livelihoods, alleviating poverty and contributing to the overall sustainable socio-economic development.

The fisheries MSME sector, particularly the subsistent/marginal as well as self-sufficient/small surplus sub-sectors, is confronted with a wide-range of issues and challenges. These include the limited access to technology, micro-credit and local financial services as well as to domestic market. The insufficient entrepreneurial spirit and management skills, compounded by the lack of information, limited compliance to standards and certification, and the absence of an environment conducive to various business ventures, have also contributed to the concerns of this sector.

The ASEAN Member Countries in collaboration with SEAFDEC and the ASEAN Secretariat with funding support from the ASEAN Foundation through Japan-ASEAN Solidarity Fund, had initiated and implemented the Project on the Promotion of “One Village, One Fisheries Product (FOVOP)” System to Improve the Livelihood of the Fisheries Communities in the ASEAN Region (2007-2010). The 30-month Project introduced the adapted the “One Village, One Product (OVOP)” concept which originated from Oita Prefecture in Japan, under the context of the ASEAN region’s fisheries scenario.

Through the experiences and lessons learnt from the Project as well as other on-going OVOP-like initiatives in the ASEAN region, FOVOP has been identified as a potential approach which could contribute to the region’s efforts in providing alternative/supplementary livelihoods to fishers and their communities through enhanced rural economy and abated poverty. In effect, fishers and their communities would be empowered in order to be actively engaged in long-term fisheries development and management processes.

II. KEY ISSUES AND CHALLENGES: FOVOP CONTRIBUTION TO SUSTAINABLE FISHERIES AND RURAL ECONOMY

1. Policy Framework and Enabling Support

An appropriate national policy framework for the promotion of FOVOP is necessary as an important initial step towards the successful adoption of the FOVOP initiative. Such policy framework should be formulated/strengthened as part of the national poverty alleviation policy and program as well as that of national fisheries development framework. The responsible institutions and delegation of the functions/responsibilities from the national to local levels should also be clarified under such national policy framework.

Moreover, the target beneficiaries for the promotion of FOVOP should also be specified. Noting that most ASEAN Member States have in place national policies and programs supporting SME development including those in the fisheries sector, the target beneficiaries should be focused on the fishers as households/family units pursuing economic activities as well as the groups of fishers. Development of the FOVOP initiative should be anchored on such target beneficiaries to ensure that their interests/ownership/commitments are directed while the government should provide the policy and enabling support which could be enhanced through consultative processes.

Considering that enabling policy support is essential to foster the implementation of FOVOP initiatives, such policy support could include the integration of FOVOP into the value-chain and market, micro-credit and financial services systems, regulatory and control on product/service standards and certifications, education and capacity building on various aspects of FOVOP implementation, and public investment in products/services research and development. Inter-agency coordination among the fisheries line agencies and agencies working in support of rural development at various levels should also be established and/or enhanced and promoted.

2. Fisher's Institutional Building with Emphasis on Women's Groups and the Youth

Institutional set-up of fishers' groups or organizations is an important social process of the FOVOP promotion, where women's groups and the youth should be encouraged to take part in the process. Local mechanisms to strengthen the capability of the institutions in sustaining FOVOP initiatives should also be ensured. Regular conduct of capacity building activities, including visits and exchange programs on various aspects such as technology development and innovations, management skills as well as basic accounting and bookkeeping, among others, could certainly help promote the FOVOP initiatives.

3. Product Development and Improvement with Emphasis on Value-added Products/Services

FOVOP works well when the products/services are identified and prioritized based on uniqueness, comparative advantages of the communities as well as products/services marketability. Consideration should be made on the sources and supply of raw materials, marketability of products/services as well as on product quality and safety standards and assurance, packaging and labeling. The need to develop the national guidelines and supporting systems could aptly support these requirements.

4. Credit and Financial Services and Facilities

As the development and implementation of FOVOP requires certain amount of capital and investment cost, the possibility of establishing micro-credit and financial services and facilities should be explored. These could include among others the establishment of community or group savings which could serve as accessible source of investments and also as source of counterpart funds or as form of collateral for soft loans with commercial banks or as counterpart funds for

grants or financial assistance from governments, non-government and international organizations, co-funding source among the existing groups, organizations or associations to strengthen the financial status and position of the communities in order to be able to obtain as groups, soft loans, grants, and other financial assistances.

5. Marketing Development and Products/Services Promotion

A system of marketing and distributing the products/services should be built-in the FOVOP initiative to support easy access to domestic markets and local value-chain. Market supporting systems could be linked to the existing national SME marketing campaigns. Finally, capacity building for fishers and fishers' institutions should be conducted to enable them gain access to the markets.

6. Human Resources and Entrepreneurial Capacity Development

Systems capacity building for the target beneficiaries should be established to support the FOVOP initiative. Capacity development activities should, among others include products/services development, management skills for FOVOP development, rural leadership. Such activities could be carried out through training, exchanging of experiences and networking.

III. WAY FORWARD FOR FUTURE COOPERATION

The Regional Guidelines on the Promotion of FOVOP in the ASEAN Region could be used as regional reference in the national implementation of the FOVOP initiative as well as in planning for regional supporting programs. In order to promote the adoption of the FOVOP approach in the ASEAN region, the ASEAN Member Countries should investigate the applicability of the Regional Guidelines and be responsible for the implementation of the Regional Guidelines. Where appropriate, the ASEAN countries could make the necessary adjustments of the Regional Guidelines that fit the nature and requirements as well as the locality and specificity of the respective countries.

Thus, for the promotion of “One Village, One Fisheries Product” (FOVOP) in the ASEAN Region, the following strategies were identified for future implementation at national and regional levels:

1. Raising awareness and understanding on the FOVOP initiative on the part of the policy-makers of the ASEAN (*i.e.* the ASEAN Sectoral Working Groups – Fisheries, Agricultural Cooperatives, SMEs Development) and the SEAFDEC Council to obtain their support and ensure that the ASEAN countries implement the Regional Guidelines in their respective localities, and promote the adoption of the FOVOP approach in the region;
2. Mainstreaming the FOVOP initiative into the regional policy and cooperation framework. Regional cooperation among the ASEAN Member States and international/regional organizations could foster the future development of the FOVOP initiatives in the region. Specifically, mainstreaming FOVOP as an approach supporting development and integration of the fisheries sector as part of the ASEAN Community building process could be considered; and
3. Formulating the regional Supporting Program similar to the FOVOP movement for future promotion and implementation could be facilitated with possible support from the ASEAN and its dialogue partners.

**PROPOSED INPUTS FOR THE ASEAN-SEAFDEC
“FISH FOR THE PEOPLE 2020” CONFERENCE**

I. INPUTS FOR THE RESOLUTION

“Providing alternative/supplementary livelihoods to fishers and their communities through enhanced rural economy, alleviating poverty, and empowering fishers to be actively engaged in long-term fisheries development and management processes by mobilizing the “One Village, One Fisheries Product (FOVOP) approach”.

II. INPUTS FOR THE PLAN OF ACTION

- Mainstreaming FOVOP initiative into national poverty alleviation program
- Mainstreaming FOVOP initiative into national fisheries policy and strategy for implementation in the ASEAN Countries
- Mainstreaming FOVOP initiative into regional policy and cooperation framework
- Developing Regional Supporting Program to support the promotion of FOVOP in the ASEAN Region.

III. INPUTS FOR THE REGIONAL PROGRAM SUPPORTING THE IMPLEMENTATION OF THE NEW RESOLUTION AND PLAN OF ACTION

The following are the priority areas of activity necessary to support the implementation of the new Resolution and Plan of Action:

- Awareness and capacity building, and networking with relevant stakeholders and target beneficiaries within and among countries as well as between countries and international/regional organizations by exploring the establishment of sharing mechanisms in terms of expertise, experience and lessons learned to ensure the success in the promotion and implementation of FOVOP in the ASEAN Region.
- Monitoring the progress of the FOVOP promotion and implementation in respective ASEAN countries through coordination and collaboration among the networking partners at national and regional levels.
- Facilitating the development of Supplementary Guidelines on specific areas/issues that require substantive direction and guidance for the promotion and implementation of FOVOP in the ASEAN Region.

IV. SUPPORTING REFERENCES:

- ASEAN Economic Community (AEC) Blueprint (A6. Priority Integration Sectors, A7. Food, Agriculture and Forestry, and C1. SME Development)
- ASEAN Policy Blueprint for SME Development (APBSD) (2004-2014)
- ASEAN Strategic Action Plan for SME Development (2010-2015)
- ASEAN Strategic Plan of Action for Food, Agriculture and Forestry (2006-2010)
- Regional Guidelines for the Promotion of “One Village, One Fisheries Product (FOVOP)” in the ASEAN Region

PROGRAM DOCUMENT

Program Category: Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title: Human Resource Development (HRD) on Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region
Lead Department: The Secretariat
Total Duration: 2008-2010

1. INTRODUCTION

Despite overall social and economic development in the ASEAN region, the disparity of social and economic well-being among/within the most of Member Countries can be the one of the serious constraints to further promote the countries' development. The low social and economic well-being has led a large number of people in the region, especially in rural area, to live in poverty status. As fisheries is one of potential sector for such coastal and inland communities to improve their livelihoods as well as their source of protein food, the HRD project therefore being developed to focusing on these rural poverty is identified as an urgent requirement in the region.

2. PROGRAM

2.1. Objectives:

To enhance human capacity of fishers of selected rural fishery communities as well as relevant fisheries government officials and those working at local level in support of fishery communities in order to alleviate the identified poverty status through fisheries intervention covering 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 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 fisheries intervention.

2.2 Program Description:

Main activities under this program are as follows:

- 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:

- Local/indigenous institution and co-management: *Secretariat and Training Department*
- Responsible fishing technologies: *Training Department*
- Backyard fishery post-harvest technology: *Marine Fisheries Research Department*
- Rural aquaculture: *Aquaculture Department*
- 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 seven specific sites as identified at the 1st 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. The followings are the required steps to implement the project activities.

- Identification of specific local indigenous institution for the sites.
- Identification of the types and manners of HRD activities.
- Identification of the appropriate numbers of beneficiaries.
- Collaboration mechanism with the host governments.
- Finalization of the Terms of Reference of the staff involved both for national and regional technical staff.
- 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.

3. PROGRESS ACTIVITIES IN THE YEAR 2010-2011

3.1 Activities Achievements in the Year 2010

HRD on-sites activities

The implementations of on-site HRD activities were conducted in eight countries within the ASEAN region (Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand and Vietnam). After the 1st RTC, it was agreed that the pilot HRD activities should be conducted within two sites (inland/marine areas) in respective countries, which the participating countries prioritize HRD thematic issues and then select only 4 thematic issues to be implemented. At the on-site HRD activities, participating countries would mobilize the HRD materials, which have been developed under supervision of SEAFDEC Departments and translate into local language. According to the series of HRD Activities on Thematic Areas, on-site HRD activities would be implemented in collaboration with the host governments which propose the on-site HRD activities.

Both activities were considered as inter-relation and a series of training, which need contribution from all SEAFDEC Departments. All participants were expected to share their experiences in implementing the on-site HRD activities and strengthen their co-operation to extend the activities in the future.

Each activity of the on-site HRD was carried out by SEAFDEC Secretariat and the Departments in collaboration with the participating countries based, and along line with the previous HRD activities on thematic areas that will be conducted by respective Department. Both activities were considered as inter-relation and a series of training, which need contribution from all SEAFDEC Departments.

Activity Title	Duration	Site
ASEAN-SEAFDEC On-site Human Resources Development (HRD) Activities in Vietnam	6-10 January 2010	Nghe An province
ASEAN-SEAFDEC On-site Human Resources Development (HRD) Activities in Thailand	11-15 January 2010	Mae Rumpheung, Rayong province
ASEAN-SEAFDEC On-site Human Resources Development (HRD) Activities in Philippines	8-12 February 2010	Santa Ana village, Cagayan Province
ASEAN-SEAFDEC On-site Human Resources Development (HRD) Activities in Lao PDR	18-22 January 2010	DonxayOudom and Sengsawang, Vientiane province
ASEAN-SEAFDEC On-site Human Resources Development (HRD) Activities in Thailand	15-19 March 2010	Ang-Thong Province

The Second ASEAN-SEAFDEC Regional Technical Consultation on Human Resources Development for Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region

In order to conclude achievements from those project activities by each concerned Department and relevant countries on human resources development for poverty alleviation and food security by fisheries intervention in the ASEAN Region, the 2nd ASEAN-SEAFDEC Regional Technical Consultation on the aforementioned subject, was held from 17 to 19 August 2010.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Issues

Result of the participant's evaluation of the training duration and scope showed that almost all of the participants were satisfied with the training content. However, the training duration was considered as too short. It was suggested that the training period should be extended; there should be more training on technology adoption of various species to be cultured; and more information on freshwater fish culture. During the group discussion, the participants also suggested that there should be case study presentation from each member country so that there would be exchange of information and experiences on aquaculture technologies developed in other Member Countries.

All participants attained their training expectations and considered the training beneficial to their current work. Everyone was confident that they would be able to develop the final HRD materials to be used in their project site when they go back to their home country. As to whether they would be able to conduct the next activity which is the *On-site HRD*, only one participant gave a negative response and to enable him to implement such activity he needs technical support from specialists. There was also a recommendation that SEAFDEC should assist the conduct of training activities for aquaculture project especially on the adoption of modern technology in fish farming.

3.2.2 Expected final goals of the program

The development objective is to comprehensively alleviate the rural poverty by the fisheries intervention and promote the rural food security in the beneficiary areas and the countries, through enhancement of human capacity at fishery community level by mobilizing of regional expertise and experiences as well as participating of government official who directly involve in development of fishery community to sustain the development and follow-up activity at the national level.

3.3.3 "Steps" toward achieving final goals

Step1: The participation of the fishery community in the activities and its impact on poverty alleviation and food security as well as enhance capacity of fishers, and extend to both government and non-government co-operation in ASEAN Member Countries.

Step2: The effective implementation of HRD activities at the local level proposed as on-site HRD activities for small-scale fishers has to fully depend on the level of involvement and cooperation of national government and fishery community, the proposed activities of the 1st Regional Technical Consultation (RTC) and followed by HRD activities on thematic areas are the key to achieve and sustain poverty alleviation by fisheries intervention.

Step3: Engagement and commitment of fishery communities at regional planning level and on-sites activities.

3.2.4 Progress and achievements of the current program

Refer to the outcome of the Second ASEAN-SEAFDEC Regional Technical Consultation on Human Resources Development for Poverty alleviation and Food security by Fisheries Intervention in the ASEAN Region, conducted from 17-19 August 2010 in Thailand, and attended by concerned delegates of the ASEAN countries, who were also involved in the project activities including the national pilot process in their respective countries, the country delegations presented their experiences and the lessons learned from the national activities particularly during the HRD

on-site activities, needs and follow-up activities. The main project outputs adopted at the 2nd RTC were the Regional Policy Recommendations on Poverty Alleviation by Fisheries Intervention (*Appendix I*).

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

Regarding this project is terminated by 2010, the Program Committee is requested to take note and support the “Regional Policy Recommendations on Poverty Alleviation by Fisheries Intervention” for future promotion of HRD in the ASEAN Region. In addition, this Regional Policy Recommendations on Poverty Alleviation by Fisheries Intervention will be submitted to the Council for consideration and endorsement by 43rd Meeting of SEAFDEC Council.

REGIONAL POLICY RECOMMENDATIONS ON POVERTY ALLEVIATION BY FISHERIES INTERVENTION

I. BACKGROUND AND RATIONALE

In the ASEAN region, the fisheries sector plays an important role in terms of producing food, generating income as well as in accelerating national social and economic development. However, the main contributor of this sector especially the fishery communities still remain impoverished. Moreover, the fishery communities are also generally exposed to multiple dimensions of poverty (*e.g.* inadequate services, low level of education, politically poorly organized communities, vulnerability to the various factors that bring about poverty), which are webbed into the complex conditions of the communities, making poverty alleviation difficult to achieve within a short span of time.

Fish remains the major commodity that contributes to the source of protein for the peoples in Southeast Asia. In addition, fish and fishery products could also uplift the economies of the countries. The fisheries sector could therefore influence the social and economic development of the fisheries communities. Thus, the fisheries sector could alleviate poverty in fisheries communities only if sustainable resources utilization and management are put in place with the objective of enhancing the communities' livelihoods and ensuring local food security of the communities. In order that the fisheries sector of the region could promote improved livelihoods in fisheries communities, poverty alleviation in the fisheries sector should be made part of every country's sectoral policy and initiatives, which could include enhancing the human resources capacity of concerned stakeholders. This concern was recognized by the ASEAN and SEAFDEC Member Countries when the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region was adopted in 2001.

The ASEAN and SEAFDEC also acknowledged that addressing poverty issues could eventually lead to the reduction of the socio-economic disparities in the ASEAN region. In fact, alleviating if not eradicating poverty in the countries in the region could pave the way for the ASEAN Community Building which as envisaged, could be attained by 2015. Such concerns however, could only be effectively addressed through technical and development cooperation on the rational utilization of the fishery resources. In addition to enhancing the capacity of the members of fishery communities, the capability of government officials should also be improved as part of the important strategy of ensuring long-term improvement of livelihoods and alleviation of poverty in the fisheries communities. Towards achieving such objectives, SEAFDEC initiated in 2008 the two-year project on Human Resource Development (HRD) for Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region with financial support from the ASEAN Foundation through the Japan-ASEAN Solidarity Fund.

The HRD Project specifically aims to alleviate poverty in fisheries communities through enhanced human capacity at the community level. As envisaged, this would be carried out by mobilizing regional expertise and maximizing the participation of local government officials. Considering the technical expertise and capability of SEAFDEC in fisheries and aquaculture, five HRD thematic areas were identified by the ASEAN countries as means of facilitating the attainment of the HRD Project objectives. These thematic areas are: local/indigenous institution and co-management¹², responsible fishing technologies, backyard fishery post-harvest technology,

¹² As defined in many references, fishery co-management is an approach in fisheries management whereby fishers are involved as active partners in managing the fishery resources with government agencies. In the promotion of fishery co-management, the concerned fisheries communities are empowered and provided with the necessary resources to be able to make decisions locally as well as enable them to take more responsibilities in addressing local fisheries problems.

rural aquaculture, and inland fisheries development.

II. UNDERSTANDING THE LINKAGE OF POVERTY WITH SUSTAINABLE FISHERIES

Poverty alleviation issues have not been considered as one of the main responsible issues by the government fisheries-related agencies that are considered as technical institutes. However, due to resource deterioration and the promotion of fisheries business in globalized manner, economic gaps among the fisheries people has been increasingly recognized as a standing issue to further promote sustainable fisheries in the region. The regional policy therefore, aims to clarify on how fisheries intervention through HRD can alleviate poverty in the rural people, especially in the fisheries communities, and eventually achieve sustainable fisheries development in the Southeast Asian region.

In the course of promoting and ensuring sustainable development of fisheries, there is also a need for the ASEAN and SEAFDEC Member Countries to recognize the close linkage between poverty alleviation and food security by fisheries intervention. Thus, poverty alleviation by fisheries intervention should be taken into consideration in all efforts that are aimed at ensuring sustainable livelihoods of the fishers/fish farmers in the communities. In so doing, it is important that common understanding of the issues, concerns and factors that could alleviate poverty should be achieved. It is therefore important to establish a common understanding of the linkage between poverty and sustainable fisheries, the role of human resources development (HRD) in fisheries to alleviate poverty, and the relationship between improving livelihoods in the fisheries sector and poverty alleviation.

In order to support the efforts towards attaining the aforementioned objectives, it is also necessary for the stakeholders to have a common understanding of the important and relevant terminologies that have already been developed and established by various organizations. As defined by UNDP (1997), **poverty** is a condition where opportunities and choices most basic to human development to lead a long, healthy, creative life and to enjoy a decent standard of living, freedom, dignity, self-respect and the respect of others are denied. **Poverty alleviation by fisheries** is a process by which people are becoming measurably better off over time due to their involvement/investment in fisheries activities, while **poverty alleviation** specifically involves “poverty reduction and protection” (FAO, 2005). The World Food Summit (1996) defines **food security** as a condition when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Moreover, FAO (2004) defined **human capacity development** as the process by which individuals, groups, organizations, institutions, and societies develop their abilities – both individually and collectively – to set and achieve certain objectives, perform functions, solve problems and to develop the means and conditions required to enable such process.

In recognizing the importance of sustainable fisheries development to alleviate poverty, it is necessary to assess the impacts of fisheries activities that are carried out by people in poverty situation, on the aquatic resources. This calls for the need to develop the strategy of mainstreaming poverty issues into the national fisheries policy. In other words, policy makers should be made to understand that technical support only could not improve the poverty status of small-scale fishers who comprise the majority of the fisheries sector, thus support in addressing the socio-economical problems should also be taken into consideration. This is notwithstanding the arguments that such problems should be left at the mercy of individual fishers and fish farmers, and government agencies other than fisheries.

Although the linkage between poverty alleviation activities and those aimed at achieving sustainable fisheries can be less visible showing only limited and indirect effects in the short term, creating local mechanisms to support sustainable fisheries has positive impacts on poverty alleviation in the long run. Attention should therefore, be paid on the two major stumbling blocks,

namely: the difficulty in promoting the reduction of overcapacity under the condition that alternate livelihoods could be extremely limited in fisheries communities; and the difficulty in effectively organizing the members of communities where majority of the members are suffering from paramount poverty problems, for the promotion of co-management that require full commitment and cooperation of all members of the fisheries communities. Moreover, the other areas that require government support for cooperation on sustainable use of aquatic resources should also be considered such as further expansion of seed production services, stock enhancement activities and promotion of marine culture parks/marine protected areas. These could be achieved by expanding the required R&D functions of the national fisheries-related agencies.

It is safe to preliminarily assume that the target groups of the poverty alleviation may involve a large part of the fisheries sector in the region. Categorized as small-scale, these fishers/fish farmers have so far failed to establish an appropriately focused direction. As these poor segment of fisheries sector may have different mind-sets compared with the professional fishers/fish farmers who have served as the usual counterparts for relevant activities of fisheries related agencies, special attention (provision of needed support not only along line with agency capacity) is required to deliver the services and obtain the confidence of these target groups on the relevant government agencies. It is also important to develop close dialogues with the target communities, especially in promoting the abovementioned “cooperation in achieving sustainable fisheries”.

Furthermore, recognizing that the fisheries issues are only small part of whole poverty problems of the target groups, it would be a great challenge for fisheries-related agencies to fully cooperate with other relevant sectors and agencies in providing effective support for such non-conventional counterparts, who comprise the poor segment of the fisheries sector.

III. ROLE OF HUMAN RESOURCES DEVELOPMENT (HRD) IN FISHERIES IN ALLEVIATING POVERTY

Over-capacity is one of the key fisheries management problems and the major area of concern by fisheries-related agencies in Southeast Asia. The lack and limited access to alternative/supplementary livelihoods is a major issue that prevents the diversification of livelihoods other than fisheries. Based on the above recognition, appropriate areas and levels of HRD activities as well as the necessary ways and means, should therefore be developed to widen the accessibility to alternative/supplementary livelihoods in the fisheries communities. It is also necessary to identify the effectiveness of the HRD activities to alleviate poverty in fisheries communities. Such policy should identify the target groups whose economic handicaps can be alleviated through applied HRD strategies. It is also important to clarify that the areas of “HRD” activities will not only be conventional in terms of thematic subjects but should also deal with wider subjects along line with the needs of the target groups. It is important that the objectives of the services and support provided by fisheries-related agencies should be refocused in order to comprehensively address the persistent problems of the fishers and fish farmers.

It should be understood however, that two different kinds of government support could be effective to alleviate poverty, which could be through “human resource development” and “cooperation in achieving sustainable fisheries” in a balanced manner. While the support for the first priority would be more focused on the society as a group and on the development of appropriate systems in the communities, support for the latter may more focused on the individual members of the communities. Nevertheless, it is considered important to measure the magnitude of the target sub-sector (*e.g.* small-scale fishers/fish farmers) at the national level to clearly visualize the issues in the national fisheries priority actions, even if such said target sub-sector is known to be a data-scarce sector.

It is along this objective that the HRD Project was implemented by SEAFDEC in collaboration with relevant ASEAN Member Countries from 2008 to 2010. The Project activities included the conduct of the First Regional Technical Consultation in July 2008 which established the thematic areas for the HRD Project and identified the participating countries as well as the approaches for the implementation of the HRD activities. This was followed by the HRD activities for the focal points and trainers conducted by the SEAFDEC Departments and then the on-site HRD activities conducted in selected eight (8) countries. The many lessons learned and experiences gained in the implementation of the HRD activities, could serve as reference for the other communities and countries in developing their respective local or national policies on poverty alleviation by fisheries intervention. The system that can fully mobilize available human resources such as the extension offices and local government units should be developed to comprehensively cover the fishers and fish farmers who desperately need support. In meeting the requirements of the poor, coordination and cooperation with local institutions (*e.g.* NGOs, indigenous institutions) active in the areas, should be strengthened. Such cooperation should not result in the demarcation of activities but should be promoted in order to boost coordination for the conduct of the HRD activities making sure that a balanced approach is made between the HRD on thematic issues provided by government agencies and those focusing on socio-economic issues being promoted by local institutions. While understanding that people in the economically handicapped fisheries communities have less opportunity to receive formal education and training, fisheries-related agencies should exert utmost efforts to provide more appropriate HRD activities to the target stakeholders.

IV. SECOND ASEAN-SEAFDEC REGIONAL TECHNICAL CONSULTATION ON HUMAN RESOURCES DEVELOPMENT FOR POVERTY ALLEVIATION AND FOOD SECURITY BY FISHERIES INTERVENTION IN THE ASEAN REGION

The Second RTC was organized from 17 to 19 August 2010 in Bangkok, Thailand to review and assess the outcomes and achievements in the implementation of the HRD Project activities with funding support from the ASEAN Foundation. The Second RTC was attended by representatives from the SEAFDEC Member Countries, namely: Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam; and from the ASEAN Secretariat, ASEAN Foundation, SEAFDEC Secretariat and Departments as well as resource persons from Japan and Thailand. The main objective of the Second RTC was to develop the regional policy recommendations that could be used as guide for the establishment of national policies for poverty alleviation and food security by fisheries intervention. The participants in the Second RTC developed the following Draft Regional Policy on Poverty Alleviation by Fisheries Intervention which would be referred to the ASEAN countries for consideration, in order to come up with the agreed Regional Policy on Poverty Alleviation by Fisheries Intervention.

V. DRAFT REGIONAL POLICY ON POVERTY ALLEVIATION BY FISHERIES INTERVENTION

Although it has been recognized that the poverty is a built-in problem for the fisheries sector in Southeast Asia, relevant actions to alleviate the problems has never been seriously taken when various fisheries development activities were prioritized and promoted. It has also been increasingly recognized that the promotion of sustainable fisheries could not be achieved, unless poverty alleviation issues are properly addressed and improved. In analyzing poverty in fisheries communities, two main issues and concerns should be addressed, *i.e.* empowerment of the fisheries communities, and support for fisheries communities in enhancing their fisheries livelihoods or alternative livelihoods related to fisheries and non-fisheries. Government fisheries-related agencies are encouraged to consider as far as possible, in implementing the various approaches developed during the implementation of the HRD project as part of their relevant anti-poverty related activities, in collaboration with their respective local government units and agencies.

Moreover, success in the implementation of any activities depends on the attitude, understanding and values of the target stakeholders (*e.g.* fishers, fish farmers, local/central government officers, local peoples in fisheries communities). While formal training generally impart knowledge on physical, social and mental skills, little emphasis is made on the target stakeholders' attitudes, mental understanding and psychological values which are necessary to accomplish the objectives of the activities, where psychological values could include patience, honesty and humility. This means that the effectiveness and accomplishments of the target stakeholders are limited compared to the potentials and opportunities that are available. While skills development makes use of physical energy, values formation makes use of the psychological energy of the personality of individuals. Thus, the scope of improving personal effectiveness in attaining the objectives of the activities through values formation should also be made part of the HRD activities.

1. Empowerment of the fisheries communities

The HRD will be more focused on capacity building to build up indigenous/local institution that can help the people and cooperate with fisheries-related agencies in achieving sustainable fisheries. The areas of HRD could be focused on such areas as development of future leader(s), participation and recognition of the roles in gender equity and youth to the communities' works, development of closer dialogue between communities and fisheries-related agencies, provision of more and appropriate information, and the promotion of values formation among people.

Considering that most members in fisheries communities are inadequately educated, national governments should exert efforts to improve the educational facilities making sure that such efforts spread to the fisheries communities. The HRD activities to be implemented could focus on the technical aspects balanced with socio-economic concerns. The materials used in the HRD activities should be translated into the respective local languages to promote wider understanding of the technical terms. Moreover, study tours and case studies could comprise the HRD activities in order to promote understanding of the ways of life in the fisheries communities.

Selecting the target sites for HRD activities could be convenient at first, in communities where organized groups already exist as it would be convenient to select the target participants. The absence or shortage of community-based activities in a community could make it difficult to manage the activities. In addition, concerned organized groups should have a good leader with confidence and get the support of the members. This could mean improving the capability of the local groups' leaders by providing them leadership and management training, to enable them to take up leadership in the community activities.

Participatory approach is the key to the successful implementation of the HRD activities for poverty alleviation. Thus, in the implementation of the activities, the different ways of thinking and views among the older generation, women, and the youth in the community should be assessed. The results could be used as appropriate approach in order to strike a balance of the interests of such stakeholders. This is envisaged to empower the concerned stakeholders and contribute to the effective implementation of the activities as well effective establishment of the ownership of the activities by the relevant communities.

After implementing the on-site HRD activities in selected pilot countries, an increasing number of fishery officials and extension workers also learn the concepts of responsible fisheries for food security and poverty alleviation. In order to sustain such interests, efforts should therefore be made in order that the HRD activities are promoted as part of the countries' top priority policies on sustainable fisheries development. Specifically, extension workers should be trained in effective communication, negotiation skills and their awareness of the issues in fisheries should be enhanced. On the other hand, the capability of local government units should be boosted to enable their respective officers to take up the responsibility of implementing the HRD activities in the respective areas of responsibility.

2. Support for fisheries communities in enhancing their fisheries livelihoods or alternative livelihoods related fisheries and non-fisheries

In order to provide support for the creation of alternative livelihoods in the fisheries communities, national governments should make sure that the members of the communities have access to the resources and basic services, assistance is provided to the members in identifying the appropriate and suitable livelihoods, the members are made to understand the mitigation measures on the impacts of climate change, and most of all government support to the communities should be heightened.

While appropriate HRD activities should be provided (via strengthened extension system), emphasis should be given on the approach of encouraging communities to diversify their livelihoods other than fisheries in collaboration with other relevant agencies and organizations. This strategy could also address the inability of most fisheries communities to access to resources and basic services. This could be achieved through the establishment of freshwater and marine protected areas, improving fish seed production centers and promoting stock enhancement, promoting ecotourism and marine parks, and improving access to transportation and communication as well as health and safety facilities. Considering the experience in the promotion of “One Village, One Fisheries Products (FOVOP)” in the ASEAN region, the FOVOP approach could be considered complementary to the support and promotion of livelihoods and poverty alleviation, as additional income sources for the fisheries communities.

Prior to the implementation of any HRD activities, it is necessary to assess the people’s needs through the closely related approaches such as the Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA). These methods are useful in gathering information that could provide understanding about the communities and respective members and address the requirements of the target communities. The results would also lead to the adjustments of the activities to make the activities more appropriate and are in accordance with the needs of the members with respect to particular activities.

Awareness on the impacts of climate change to the fisheries communities should be made part of the HRD activities. This would mean promoting capacity building of stakeholders on climate change adaptation and the measures that could mitigate the impacts of climate change. Specifically for aquaculture, practices that are adapted to climate change could also be promoted. This would need the strong support from national governments to build up the capacity of the communities to adapt to the impacts of climate change in the environment.

The support on “adaptation to the climate change” is specially needed for members of fisheries communities who are the most vulnerable sector of such phenomena. Sharing information through expanding research capacities in the relevant fields can be the needed support to address such concerns. Moreover, national governments should also intensify support in various areas such as in promoting co-management, advancing R&D, provision of incentives and infrastructures, improvement of marketing systems and information, establishing small-scale cooperatives and micro-credit systems, and enhancing policy advocacy. Despite modernization of various fishing technologies, local fish marketing system has remained traditional system and one of the problem areas that continue to drive the fisheries communities to poverty. However, modernization of local market systems would require government legal and technical support for the target fisheries communities to enable the members to improve their incomes.

V. FOLLOW-UP ACTIONS AND WAYS FORWARD FOR FUTURE COOPERATION

HRD materials developed through the Project on Human Resources Development (HRD) for Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region (2008-2010) should be compiled and disseminated through ASEAN and SEAFDEC information mechanism and tools. These materials together with the regional policy recommendations can be

used as reference to support the strengthening of national policies and initiatives in promoting HRD on poverty alleviation by fisheries intervention.

- Development of the Regional Guidelines on Poverty Alleviation by Fisheries Intervention taking into consideration the draft regional policy recommendations could be initiated. This would however, require the need for further consultations to transform the policy recommendations into guidelines.
- Conduct of HRD activities in areas other than the selected pilot sites, which should be undertaken as soon as the Regional Guidelines have already been adopted. The HRD activities could then include orientation and familiarization of the Regional Guidelines by the stakeholders to enable them to adapt the concept of the HRD activities in order to hasten the eradication of poverty in the regions' rural fishing communities.
- Identification of the specific roles of the various stakeholders, including the responsibilities of the ASEAN countries in the implementation of the Regional Guidelines in order to promote the implementation of HRD activities that could help eradicate poverty in the region. The role of SEAFDEC as the source of the technical support should also be specified.
- Identification of the appropriate agency responsible for monitoring the progress of the implementation of the Regional Guidelines for Poverty Alleviation by Fisheries Intervention, and the assessing the level of influence of the Regional Guidelines on the eradication of poverty in the ASEAN region.

VII. PROPOSED INPUTS FOR THE ASEAN-SEAFDEC “FISH FOR THE PEOPLE 2020” CONFERENCE

Noting the inter-linkages between poverty alleviation and food security leading to long-term sustainable development of fisheries, this regional policy recommendations should be articulated and mainstreamed into the preparation and finalization of the Decade Resolution and Plan of Action, which will be concluded at the ASEAN-SEAFDEC Conference on Sustainable Fisheries Development for Food Security in the ASEAN Region, from 13 to 17 June 2011 in Bangkok, Thailand.

Inputs for the Resolution

“Strengthen the promotion of HRD activities for poverty alleviation by fisheries intervention through mobilization of available human and technological resources and harmonization of initiatives and support of the fisheries communities and governments”.

Inputs for Plan of Action

- Institution building on community organizations for community support and as basis for promotion of co-management in fisheries communities
- Improvement of members' skills for expanding the potentials of accessing to alternative livelihoods
- Advancement of HRD on appropriate fishing, aquaculture, and post-harvest technologies for sustainable fisheries and aquaculture development in fisheries communities

PROGRAM DOCUMENT

Program Category: Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
 Program Title: ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020
 Responsible Department: SEAFDEC Secretariat and All Departments
 Lead Country: All Member Countries
 Total Duration: 2009-2011

1. INTRODUCTION

Executive Summary of the Project Proposal
Project Title: ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020
Project Type: The Conference: 1) to support ASEAN Community Building by promoting greater awareness of the ASEAN identity, people-to-people interaction, and close collaboration among stakeholders in ASEAN in the joint activities through human capacity building, in accordance with the implementation of ASEAN Charter to achieving the ASEAN Community Integration; and 2) to make every effort to contribute to promoting development and cooperative strategies conducive to mutual support, equal economic development, improvement of livelihood and alleviation of poverty, and ensuring long-term food security with contribution from fisheries
Executing Agencies: The Joint Conference Secretariat, composed of the ASEAN Secretariat, the Southeast Asian Fisheries Development Center (SEAFDEC), and the ASEAN Member Countries represented by the Department of Fisheries (DOF), Thailand
Eligibility: SEAFDEC is an intergovernmental organization established in Southeast Asia being responsible for the promotion of sustainable fisheries. Based on its technical competence in various disciplines of fisheries, SEAFDEC over the past 41 years has played a significant role in promoting sustainable fisheries development in the region. Towards implementation of the Conference, ASEAN Member Countries and SEAFDEC will achieve the following: 1) Promotion of ASEAN awareness on sustainable fisheries and its contribution to food security amongst its people and the world beyond; 2) Promotion of closer relations amongst the people of ASEAN, their greater participation in ASEAN activities, and the reinforcement of ASEAN solidarity as one community; and 3) Support of development cooperation in addressing the issues of poverty alleviation, other socio-economic development, and new emerging fisheries related issues including climate change and its impact to fisheries.
Priority: ASEAN Community Integration (the ASEAN Economic Community (AEC), and the ASEAN Socio-Cultural Community (ASCC) (by 2015); ASEAN Integrated Food Security (AIFS) Framework and the Strategic Plan of Action on Food Security in the ASEAN Region (SPA-FS) (2009-2013); ASEAN vision 2020; Hanoi Plan of Action stress the importance of the food security in ASEAN region; and the Resolution and Plan of Action on Sustainable Fisheries for Food Security in the New Millennium (adopted in 2001)

2. PROGRAM

Project Title: ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020

Problem to be addressed

Guided by the Resolution and Plan of Action adopted at the Millennium Conference in 2001, almost the past ten years SEAFDEC and ASEAN Member Countries have made significant progress in promoting sustainable fisheries in the region. With the deteriorating state of the world's ecosystem and environment brought about by climate change, and social and economic factors particularly global economic crisis, it is necessary that the Southeast Asian region keep abreast and be able to address future challenges faced by our fisheries. At the start of the new decade, the region should firstly review the development of the fisheries in the past based on the implementation of activities in line with the Resolution and Plan of Action, and secondly, have a

clear policy on how fisheries sector can achieve sustainable fisheries in the future. Special emphasis should also be given to the sustainable contribution of fisheries to regional food security and poverty alleviation for the increasing population in the region. In addition, as the people in the region fully depend upon fisheries production, the impact of the reduced supply of fisheries product, increasing fuel/oil price will not only affect the food security, but also have the regional implications on their livelihood, socio-economic situation and foreign exchange earnings.

Background

The ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People” was held in November 2001. The Conference was in response to widespread regional concern over unsustainable fisheries practices, which may negatively affect future fish supplies for food security and the economic and social well-being of people in the ASEAN region. Attention focused on fisheries issues of specific concern to the ASEAN region, the goal being to coordinate policies and actions within the region and harmonize these with policies and actions at the international level. The Millennium Conference adopted the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region in 2001 to serve as policy framework for formulating and implementing programs, projects and activities aimed at promoting sustainable development of fisheries in the ASEAN region.

Throughout the past ten years, SEAFDEC has been providing technical assistance to the ASEAN countries by implementing activities that address the various issues towards the sustainable development of fisheries as guided by the Resolution and Plan of Action. With support from the ASEAN Foundation, from 2001-2010, SEAFDEC in close cooperation with the ASEAN Member Countries implemented programs, *i.e.* on “Promotion of Sustainable Fisheries through South-South Cooperation in the ASEAN Region”, “Capacity Building on the Improvement of Fishery Statistical Systems in the ASEAN Region”, “Human Resource Development (HRD) for Sustainable Development Fisheries in Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) Region”, “Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region”, and “Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood of the Fisheries Communities in the ASEAN Region”, which are also envisaged to improve human capacity in the Member Countries in the various fisheries-related aspects and enhance the contribution from fisheries to food security in the ASEAN region. It is envisaged that the lessons learned through these programs implementation are envisaged to also help paving ways forward to the improved food security and better livelihood of people in the region.

However, with the deteriorating state of fishery resources and the emerging fisheries-related issues during the past decade as mentioned above, the need to urgently solve the problems towards achieving sustainable fisheries development and food security was expressed, and the 31st of SEAFDEC Program Committee held in Singapore in November 2008 discussed the concept/ideas in the organization of another Conference in order to discuss the issues and to develop the new decade Resolution and Plan of Action. The concept proposal was developed and submitted to the 41st SEAFDEC Council held in Fukuoka during 7-10 April 2009. The Council endorsed the concept proposal and the conduct of the Conference and recommended SEAFDEC to further develop the detailed proposal. The Proposal of the Conference was brought up to the 17th Meeting of the ASEAN Sectoral Working Group on Fisheries (17th ASWGF_i) held from 3-5 June 2009 in Vietnam. The Meeting endorsed and supported SEAFDEC for the planning and conduct of the Conference, including the possibility of cash contribution from the private sector.

To follow-up the decisions and recommendations made by the SEAFDEC Council and ASWGF_i Meetings, detailed proposal of the Conference, including program and preparatory work was developed and discussed at the SEAFDEC Department Chiefs’ Meeting held in Bangkok from 25-26 June 2009. The detailed proposal of the Conference was further submitted for consideration and received support at the Special SOM-30th AMAF (August 2009) and the Prep-SOM-31st

AMAF (November 2009). Recently, the 31st Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF) (November 2009) endorsed the proposal to conduct the Conference in 2011, including the conduct of Ministerial Meeting and participation of the ASEAN Senior Officials and Ministers responsible for fisheries at the Conference. The Meeting also agreed to provide necessary support to the preparatory process and conduct of the Conference.

All through these meetings, the proposed Conference was regarded as the highest priority especially from the viewpoint of sustainable development of fisheries, food security and poverty alleviation, which was accorded with the strong interest of ASEAN in supporting the implementation of the ASEAN Community Integration (the ASEAN Economic Community (AEC), and the ASEAN Socio-Cultural Community (ASCC) by 2015; ASEAN Integrated Food Security (AIFS) Framework and the Strategic Plan of Action on Food Security in the ASEAN Region (SPA-FS) (2009-2013); ASEAN vision 2020; and Hanoi Plan of Action stress the importance of the food security in ASEAN region.

It is expected that the Conference would help fulfill the mandate of the ASEAN Foundation in creating greater awareness of ASEAN and the ASEAN identity which would eventually contribute to the establishment of the ASEAN Community by the Year 2015. The Conference is envisaged to promote the interaction and exchange of information on various fisheries-related issues among the ASEAN Member Countries, and provide human resources development to bridge the gap between the developing and developed countries of the ASEAN, which are also priority mandates of the ASEAN Foundation.

It is also envisaged that the continued support from the ASEAN Foundation in the conduct of the ASEAN-SEAFDEC Conference and the development of the new decade Resolution and Plan of Action would contribute to achieving sustainable fisheries development and ensuring the important contribution of fisheries to food security in the ASEAN region by the year 2020, as well as supporting ASEAN in achieving the ASEAN community building by the year 2015.

Problem Analysis

Over the past ten years, fisheries-related agencies of the ASEAN Countries have exerted their utmost effort and made significant progress in promoting sustainable fisheries in their territorial waters, however, most of the countries have encountered in difficulties for effective implementation of fisheries management measures in assuring sustainable fish supply for food security in the long term. With the deteriorating state of the world's ecosystem and environment brought about by climate change, and social and economic factors particularly global economic crisis, it is necessary that the Southeast Asian region keep abreast and be able to address future challenges faced by our fisheries. To increase the competitiveness of fisheries in the region in addressing food security and poverty alleviation, and to assist countries to adapt with the emerging situations/issues *e.g.* climate change, international fish trade, economic crisis, it is therefore an opportune time to review and discuss the implementation of the Resolution and Plan of Action in order to develop the next decade regional policy direction and plan of action on sustainable fisheries for food security in the ASEAN region.

Therefore, the coordinated actions at regional level are required as it yields advantages. First, the coordinated action at the regional level may ease a national Government to implement the required actions if these are based on the regionally agreed policy, in view of obtaining the understanding of national industries. Secondly, regionally coordinated action will provide appropriate guidelines for the countries in ASEAN, which cannot individually take appropriate action toward achieving sustainable fisheries due to their current development status. Thirdly, to ensure sustainable development for the benefit of present and future generations and to place the well-being, livelihood and welfare of the peoples of the ASEAN community building process. It is therefore extremely important to organize the proposed Conference in order to develop the

regional policy for the ASEAN region on the sustainable fisheries development especially with the focus on contribution of fisheries to food security.

The next decade regional direction and plan of action could therefore steer ASEAN Member Countries towards new directions in furthering development of sustainable fisheries and its contribution to food security, poverty alleviation and accommodating the new emerging issues (*e.g.* climate change, international fish trade, economic crisis, etc.) in the region particularly to raise the socio-economic status, alleviate poverty and enhance food security for the people of the region. It is also expected to build closer collaboration through increased direct participation and solidarity among countries in the region as well as seeking funding support from external donors.

Regionality

Due to the increased concerns on the global environment, there is a trend that the international fisheries societies have taken active roles on the sustainable fisheries issue. However, under such globalization process, regional specificity has hardly been considered. In ASEAN region, there are some specific situations to consider the appropriate actions including the facts that: 1) ASEAN people fully depend on fish for its culture including their diets, livelihood and other economic activities; 2) major part of the ASEAN fisheries is categorized as a small-scale/coastal fisheries, while those of developed countries are considered as industrial fisheries; and 3) fisheries resources in ASEAN region is regarded as the multi-species composition, while most of the developed countries harvest their fish under different ecosystem. The differences in culture, economic, structure of fisheries and ecosystem make the global standardization difficult to apply for the ASEAN situation. In 2006, the Southeast Asian region produced almost 24 million MT of fishery products (including aquaculture products). This contributed about 15% of world fisheries production. It is therefore very important that ASEAN to revisit the Resolution and Plan of Action 2001 and develop the policy for fisheries development and food security for the next decade. It is believed that the proposed Conference will contribute to the reinforcement of ASEAN solidarity through the fisheries cooperation in order to effectively respond to current and future challenges and opportunities.

Participation

During the Conference proper, after the main technical session, the high ranking officials from fisheries-related Governmental agencies, possibly with the Ministers are envisaged to participate and conclude “Decade Resolution and Plan of Action on Sustainable Fisheries for Food Security (Towards 2020)” which will be used as a policy guidance to promote the sustainable fisheries for the coming decade. Prior to the main plenary session, several technical panels on the important topics will be organized in order to ensure the successful organization of the Conference. Series of preparatory technical works in particular the Regional Technical Consultations (RTCs) will be undertaken by the initiatives of SEAFDEC by its fund (outside of the proposal) before the Conference to conclude the “technical recommendations” which will be the technical basis for the Decade Declaration. Approximately about 500 participants including the ASEAN government officials and researchers; the representatives from the industry; and International/Regional Organizations are envisaged to participate in the Conference. Throughout the process, wider and more concerned people in the region will be indirectly involved in the Conference.

Beneficiaries

Although the direct participation to the Conference proper is approximately about 500 people, the ultimate beneficiaries will be people of the ASEAN who are not only involved in the fisheries but also general consumers. Organization and participation of the Conference is only the beginning. It is believed that the implementation of the agreed “Decade Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region (Towards 2020)” will deliver greater benefits to the people in ASEAN.

2.1 Objectives

2.1.1 Development Objectives

Development objective of the project is to achieve sustainable fisheries development and food security in the ASEAN region, therefore sustainable and stable fish supply that contributed to food security and poverty alleviation could be ensured. In this connection, the proposed Conference can be regarded as the next decade milestone to reach such goal. Normally, when such Conference is organized by the specific needs, it sometimes fails to follow-up the conclusion reached at the Conference. In order to avoid such constraints, SEAFDEC will develop the Concept Notes on the Conference Follow-up Program (5-year plan) in line with the Decade Resolution and Plan of Action and made available during the adoption of the Resolution and Plan of Action. This follow-up program is considered as an integral part of the Conference although the financial arrangement of the program is outside this proposal. By integrating the Conference with these programs, SEAFDEC can extend the support to the ASEAN Member Countries to implement the required activities following the Decade Resolution and Plan of Action concluded at the Conference.

2.1.2 Project Objectives

The Project objective is to organize the “ASEAN-SEAFDEC Conference on Sustainable Fisheries Development and Food Security Towards 2020” based on the development objective and regional needs. The Conference is aimed to develop the regional policy for the next decade on “Decade Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region (Towards 2020)”.

2.1.3 Success criteria and outputs

Success Criteria

- Effective implementation of all planned preparatory work is a key for the successful organization of the Conference. This will be managed by ASEAN-SEAFDEC Advisory Committee and Organizing Committee;
- SEAFDEC has to conduct all required technical works for the Conference;
- Preparation of high level working documents for the Conference and practical proposals including the draft “Decade Resolution and Plan of Action on Sustainable Fisheries for Food Security”; and
- In order to achieve the development objective, the timely implementation of the Conference Follow-up Program (5-year plan) (outside of the project) is also counted as an important factor.

Outputs

The following outputs are anticipated through the successful organization of the Conference:

- “Technical Document” which will be used as the material for the Conference;
- “Conference Proceedings” which will summarize the outcomes from the discussion during the Conference;
- “Decade Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region (Towards 2020)”, which will be used as a policy principle in achieving the sustainable fisheries for food security in the coming decade;
- Concept Notes on the Conference Follow-up Program (5-year plan) in line with the Decade Resolution and Plan of Action;

- Awareness building on issues of the sustainable fisheries and food security through the participation of the Conference; and
- Reinforcement of ASEAN solidarity and closer cooperation in the field of fisheries by discussing and adopting the above policy instruments, in accordance with the implementation of ASEAN Charter to achieving the ASEAN Community Integration.

Indicative Work Plan

Refer to *Appendix 1*.

Management and Implementation Arrangements

The project will be promoted by the ASEAN-SEAFDEC joint Conference Secretariat located at the SEAFDEC Secretariat: Suraswadi Building, Kasetsart University Campus P.O. Box 1046 Kasetsart Post Office, Bangkok 10903, Thailand.

The Project will also be supported by the ASEAN-SEAFDEC Advisory Committee and Organizing Committee. In addition, the coordination and working mechanism with SEAFDEC Departments and ASEAN-SEAFDEC Member Countries established in SEAFDEC will be fully mobilized for the preparation of the Conference. The followings are the proposed implementation arrangements:

Timing of the Conference: 13-17 June 2011

Venue of the Conference: Sofitel Centara Grand Bangkok Hotel, Bangkok, Thailand

Organization of the Conference: The Conference will be jointly organized by ASEAN and SEAFDEC and hosted by Thailand. Therefore, all preparatory arrangements should be in line with their standpoint.

Structure of the Conference Proper: The Conference composes of the following sessions (refer to *Appendix 2*).

Inaugural Session (two quarters of a day):

The Inauguration Session will be venue to introduce the linkage between fisheries sector and the ASEAN Community Building which is expected to be achieved by 2015, as well as the contribution from fisheries to poverty alleviation, socio-economic and well-being of fishers. In addition, presentations would also be made on the outcomes and achievement in the implementation of the Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region, adopted at the Millennium Conference in 2001. The opening session will also introduce the framework and arrangements for technical working sessions that support the Ministerial Session.

Plenary Session I (two quarters of a day):

To guide and fine tune for all participants on the Conference theme on “Sustainable Fisheries for Food Security Towards 2020 *“Fish for the People: Adaptation to a Changing Environment”*”, the Plenary Session I forms the basis for the overall discussions of the Conference before breaking into the technical panels in the following 2 days on: 1) ASEAN Fisheries Towards 2020: Status, Trend and Challenges; and 2) Vision and Scene Setting of ASEAN Fisheries in 2020 (on cross-cutting issues based on the perspective of the ASEAN Member Countries)

Technical Session (2 days):

The Technical Session will be organized and will conclude the technical recommendations to develop the regional technical policy on the selected issues. Salient points of all the technical recommendations will be accommodated to form the “Decade Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region (Towards 2020)”. Concerning the participants, technical officers from ASEAN and SEAFDEC Member Countries are expected to participate in this session. In addition, technical officers from non-ASEAN but Asian countries, the representatives of international and regional organizations, as well as the representatives of private industries are expected to participate in the Session.

Under the Technical Session, 4 Panels will run simultaneously, with the tentative themes to be discussed as follows:

- 1) Enhancing Governance in Fisheries Management;
- 2) Sustainable Aquaculture Development;
- 3) Ecosystem-based Fisheries Management;
- 4) Post-harvest and Safety of Fish and Fishery Products;
- 5) Emerging Requirements for Trade in Fisheries Product;
- 6) Climate Change: Adaptation and Mitigation towards Food Security;
- 7) Livelihood among Fishing Communities and Prospects of Employment in Fisheries-related Activities; and
- 8) Sustaining Food Supply from Inland Fisheries.

In each panel, the tentative sub-themes and detailed information appears as *Appendix 3* and *Appendix 4*, which will be further finalized later on.

Plenary Session II: (one quarter of a day): Overview of the Sustainable Fisheries for Food Security Towards 2020

Plenary Session III (one quarter of a day):

Relevant international and regional organizations, donors and academic institutions, which have provided financial and technical cooperation to ASEAN Member Countries and the organization of the Conference will participate. The insights information developed by the ASEAN and SEAFDEC Member Countries on the required cooperation in fisheries and on how such cooperation could be established would be provided. This would be followed by the possible interventions/views from regional/international organizations to ensure the effectiveness in enhancing the contribution of fisheries to food security in the ASEAN region.

ASEAN-SEAFDEC Senior Officials Meeting Plus Three (Fisheries SOM Plus Three) and ASEAN-SEAFDEC Senior Officials Meeting (Fisheries SOM) (half day)

The ASEAN-SEAFDEC Senior Officials Meeting Plus Three (Fisheries SOM Plus Three) will be organized to discuss on policy and cooperation to support the long-term cooperation and partnership based on outcomes from the Conference Technical Session.

The ASEAN-SEAFDEC Senior Officials Meeting (Fisheries SOM) will be organized to finalize the recommendations from the technical sessions, particularly the draft “Decade Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region (Towards 2020)” based on concluded technical recommendations from the Technical Session to be adopted by the ASEAN-SEAFDEC Ministers.

Ministerial Session (half day):

Opening session, followed by Report from the Chairperson of SOM, and adoption of the regional policy for the next decade on “*Decade Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region (Towards 2020)*” by the ASEAN- SEAFDEC Ministers responsible for fisheries.

ASEAN Fisheries Exhibition (5 days):

The Exhibition is planned to be held simultaneously with the Conference. Considering that the required work is rather different from that of the Conference, the Exhibition will hence be separately handled. In this connection, the professional organizer will be contracted. Close communications with other international/regional organizations will be approached in order to ensure the successful organization of the Exhibition and avoiding duplication of similar activities in the region during the planning period.

Preparation of the Conference

Series of Regional Technical Consultations (RTCs) will be organized. After all RTCs have been conducted, the Meetings for preparation of the Conference (Technical – drafting technical papers, and Administration) will be organized.

For successful conduct of the Conference, two Committees and two Sub-Committees will be established in order to make a proper preparation.

Advisory Committee: To provide advice on the programs planning of the RTCs and technical component, and ensuring the support and cooperation of the Member Countries. Advisory Committee will be composed of the Members of SEAFDEC Program Committee and ASEAN-SEAFDEC Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP);

Organizing Committee: The Committee for the overall organization of the Conference is to be participated by the representatives of the ASEAN Secretariat, FAO, SEAFDEC Secretariat and Departments, and representatives from DOF Thailand;

Administrative Sub-Committee: Coordination on administrative arrangement of the Conference; and

Technical Sub-Committee: Coordination on the technical preparatory works for the Conference to be conducted by the SEAFDEC and the ASEAN Member Countries.

In addition, the required technical works for each technical subject at regional and national levels will be conducted by the SEAFDEC Departments in collaboration with ASEAN Member Countries (outside of the project). Based on all the above preparatory works, Working Documents for the technical plenary and panel sessions, and the draft “*Decade Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region (Towards 2020)*” would be prepared for the Conference (by one month ahead of the Conference).

Budget and Funding Arrangements

The required budget to be supported by the ASEAN Foundation is estimated for US\$104,135. Detailed estimated expense is referred as **Appendix 5**. In addition to this, there are also in-cash and in-kind contribution from other sources to the preparatory works and the conduct of the Conference, of which the details appear in **Appendix 6**.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 PROGRESS OF THE CONFERENCE PREPARATORY WORKS

3.1.1 Technical Preparatory Works

Technical Preparatory Works by SEAFDEC

To come up with the required inputs for each theme/sub-theme, SEAFDEC is in the process of organizing a series of preparatory meetings/consultations based on the existing programs/activities.

Technical Preparatory Works by Member Countries

In addition to the preparatory works by SEAFDEC, the ASEAN Member Countries are also requested to conduct pre-Conference national activities (*e.g.* national seminar, stakeholder consultations, etc.) to provide technical inputs for each theme/sub-theme (based on guidelines for the preparation and submission of the national inputs provided by SEAFDEC). The pre-Conference national activities are being conducted under the full responsibility of the respective countries. However, SEAFDEC could also consider providing support, *e.g.* sending resource person(s) or expert(s) to participate in the Meeting.

Preparation of the “Technical Documents”, “Resolution” and “Plan of Action”

The outcomes from the technical preparatory works by SEAFDEC and Member Countries would be consolidated into Technical Documents to be used as a basis for discussion at the Conference. In addition, the draft text of the “Resolution” and “Plan of Action” as the main outcomes from the Conference would also be prepared by the Conference Secretariat beforehand based on the outcomes of the technical preparatory works by SEAFDEC and the Member Countries. The “Resolution” and “Plan of Action” would be considered by the ASEAN-SEAFDEC Senior Official Meeting (afternoon of Day 4), and further adopted at the Ministerial Session (morning of Day 5).

3.1.2 Administrative Preparatory Works

Information and Public Relations

- Development of the Conference Logo to be used for further promotional works of the Conference and as an official logo during the Conference
- Establishment of the Conference Website www.ffp2020.org, with link from SEAFDEC websites, and the ASSP Portal Website (www.asspfisheries.net)
- Development of the Conference First Announcement and Second Announcement, and dissemination to public through participants in SEAFDEC events, network libraries, potential collaboration organizations
- Organization of the First Press Conference (21 January 2010, Bangkok, Thailand) and Second Press Conference (16 August 2010, Bangkok, Thailand)
- Production of the video to publicize the Conference

Exhibition and Side-events

- Communication with potential private organizer to conduct Exhibition/Trade Fair in parallel with the Conference (with the organizer responsible for the cost and conduct of the exhibition). It was however, agreed that trade fair would not be organized, but there

will be technical exhibition/displays to be organized by SEAFDEC and the Member Countries.

- Communicate with the Member Countries on the conduct of the Drawing Contest: Four best drawings to be provided to SEAFDEC by the end of April 2011 to be displayed at the Conference, and the drawings would be returned to the respective countries after the Conference.
- Plan for arranging post-Conference study tour program on 16 June (afternoon) and 17 June 2011 (whole day) (optional for participants, cost to be responsible by the respective participants and not included in the Conference registration fee)
- Side Meetings (to be organized by other organization at the end of Day 2 and 3)

Registration for the Conference

Registration period: starting from 1 November 2010 to the first day of the Conference

Registration mode: through website, fax, e-mail, etc.

Registration Fee:

- Early registration rate: US\$ 250 (from 1 November 2010 to 31 March 2011)
- Normal registration rate: US\$ 300 (from 1 April – 31 May 2011)

Payment mode:

- Before the Conference date (1 November 2010 to 31 May 2011: through online payment by Credit Card
- During the Conference (13 June 2011 morning): Cash only

Cancellation of the registration could be done. In this regard, US\$ 25 would be deducted from the registration fee for the cancellation made by 30 April 2011; and US\$ 50 for cancellation made during 1-31 May 2011. There will, however, be no refund if the cancellation is made after 31 May 2011. Refund would only be processed one month after the closing of the Conference.

4. REQUIRED SUPPORTS FROM MEMBER COUNTRIES AND REGIONAL/INTERNATIONAL ORGANIZATIONS

4.1 DOF Thailand (as the host government)

During the Conference Organizing Committee Meeting, the roles and responsibilities of the DOF Thailand as the host to the Conference were elaborated as follows:

- To organize the Press Conference(s) and issue the Conference Announcement(s);
- To deliver: i) Statement during the Inauguration Session; and ii) Keynote Speech;
- To invite and prepare speech for Guest of Honor to be delivered during the Inauguration Session;
- To invite representatives from embassies and other relevant organizations in Thailand to participate in the Conference;
- To make arrangements for the Prep-SOM, SOM or SOM+3 Meetings, and the Ministerial Session (including SOM and Ministerial Dinner);

4.2 Each ASEAN-SEAFDEC Member Countries

The envisaged roles of each ASEAN-SEAFDEC Member Countries are:

- To assign National Coordinator to collaborate with the Conference Secretariat on the required preparatory works;
- To organize national drawing contest and support prizes for the winners;
- To conduct Pre-Conference National Activities (review and evaluate the country's achievements in the implementation of the Resolution and Plan of Action adopted in

2001, and identify fisheries-related emerging issues/challenges to be used as technical inputs for the Conference);

- To send at least 5 officials to participate in the Conference Technical Session (with financial support from ASEAN Foundation and SEAFDEC), and additional participants (with financial support from countries);
- To coordinate and make arrangements for the participation of Senior Officials and Ministers to the SOM and Ministerial Session; and
- To prepare exhibition booth to be displayed at the Conference Exhibition.

4.3 ASEAN Secretariat (as co-organizer)

The envisaged roles of the ASEAN Secretariat as co-organizer of the Conference are:

- To coordinate with ASEAN dialogue partners and donors for financial support to the Conference;
- To deliver statement during the Inauguration Session;
- To provide technical inputs *e.g.* experts/resource persons, during the preparatory process and at the Technical Session of the Conference; and
- To work together with SEAFDEC to develop the draft text of the “Resolution” and “Plan of Action” to be considered by the SOM and adopted at the Ministerial Session of the Conference.

4.4 Other partner organizations

Although the envisaged roles of other partner organizations in the preparation and conduct of the Conference could be different for each organization, depending on the respective form of collaboration; the envisaged roles of the partner organizations may include:

- To provide financial support for the preparation of the Conference;
- To provide technical inputs, *e.g.* experts/resource persons, during the preparatory process of the Conference;
- To send experts/resources person(s) to involve in the Technical Session, *e.g.* delivering keynote speeches, chairing the session, performing as panelist/Rapporteur, delivering organization statements;
- To send representative(s) to participate and provide technical intervention/inputs during the Technical Session; and
- To consider organizing side-events during the Conference (evening session)

SEAFDEC has issued letters to potential regional/international organizations; and currently the organizations that provide positive indication to involve in the Conference include:

- Food and Agriculture Organization of the United Nations
- Mekong River Commission
- Asian Institute of Technology
- Network of Aquaculture Centres in Asia and Pacific (NACA)
- WorldFish Center
- Fisheries Research Agency of Japan
- Japan International Research Center for Agricultural Sciences (JIRCAS)
- Coastal Development Center (CDC)
- Tokyo University of Marine Sciences and Technology of Japan (TUMSAT)
- Hokkaido University
- National Fisheries University of Japan
- School of Marine Science and Technology, Tokai University of Japan;

- Faculty of Fisheries, Kagoshima University, Japan;
- Hiroshima University of Japan; and
- Marine Institute of the Memorial University of Newfoundland (MI).

SEAFDEC would further continue to communicate and involve more organizations to involve and participate in the Conference

5. WORK PLAN

Taking into consideration the required technical and administrative preparatory works for the Conference, the Conference Work Plan appears as *Appendix 7*.

6. FINANCIAL MATTERS

It is estimated that the total budget required for the organization of the Conference are US\$ 1,202,040. This amount would be obtained from in-cash and in-kind contribution from various sources, *i.e.* the ASEAN Foundation, Japan Contribution to SEAFDEC, ASEAN Dialogue Partners, collaborating organizations, host governments and other Member Countries, funding support from other donors, as well as from the conference registration fee, etc.

For the funding support to the Conference, the current status is as follows:

- Japan Contribution to SEAFDEC amounting to US\$ 238,019;
- ASEAN Foundation: the proposal for funding support in the amount US\$ 104,135 (Proposal appears as Annex 4) was approved by the ASEAN Foundation through Japan-ASEAN Solidarity Fund in August 2010; and
- ASEAN Dialogue Partners: consideration on the proposals submitted by SEAFDEC to the ASEAN Secretariat for funding support from the Japan-ASEAN Integration Fund (US\$ 25,000 for the participation of additional 5 participants each for CLMV Countries, and US\$ 48,000 for employment of 3 International/Regional Consultants in SEAFDEC for the preparatory works and support for the Conference; is still pending and SEAFDEC is waiting for response from the ASEAN Secretariat.

Indicative Work Plan
of the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security and Exhibition in 2011

Events/Activities	2009						2010												2011					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Regional Technical Consultations (RTC)[1]																								
Advisory Committee Meeting[2] • First Meeting • Second Meeting					1d												1d							
Organizing Committee[3] • First Meeting • Second Meeting					1d												1d							
Technical Sub-Committee Meeting • Ad-hoc meeting (Prep. works) • First Meeting • Second Meeting			1d					1d							1d									
Administrative Sub-Committee																								
National Seminar on Implementation of the Resolution and Plan of Action																								
Experts Meeting																				3 d				
The Conference and Exhibition																								5 d

[1] RTC will be organized by SEAFDEC budget outside of the Project Proposal

[2] 1st and 2nd Meeting of Advisory Committee be included in the agenda of the 32nd and 33rd Meeting of SEAFDEC Program Committee

[3] 1st and 2nd Meeting of Organizing Committee will be held back-to-back with the 32nd and 33rd Meeting of SEAFDEC Program Committee

Appendix 2

CONFERENCE STRUCTURE

I. CONFERENCE STRUCTURE

Date: 13-17 June 2011

Venue: Sofitel Centara Grand Bangkok Hotel, Bangkok, Thailand

The Conference Structure

DAY 1 (13 JUNE 2011)				
0800-0900	Registration			
0900-1100	Inauguration Session <ul style="list-style-type: none"> • Opening of the Conference (to be re-sequenced as appropriate) <ul style="list-style-type: none"> ○ Welcome Remarks by the Secretary-General of SEAFDEC ○ Welcome Remarks by the Secretary-General of ASEAN (or Deputy Secretary-General responsible for fisheries) ○ Report by Director-General of the Department of Fisheries, Thailand ○ Opening Remarks by the Guest of Honor • Photography Session • Visit to the Exhibition 			
1100-1130	Coffee/Tea Break (Press Conference)			
1130-1230	<ul style="list-style-type: none"> • Keynote Speeches <ul style="list-style-type: none"> ○ Fisheries and ASEAN Community Building (ASEAN) ○ Fisheries for poverty alleviation and socio-economic well-being of fishers (DOF) ○ Fisheries and new emerging issues (FAO) • Introduction of the Framework and Arrangements of the Technical Session (SEAFDEC) 			
1230-1400	Lunch			
1400-1530	Plenary I: ASEAN Fisheries towards 2020: Status, Trend, and Challenges			
1530-1600	Coffee/Tea Break			
1600-1700	Plenary I: Vision and Scene Setting of ASEAN Fisheries in 2020			
1900-2200	Reception Dinner hosted by DOF Thailand and SEAFDEC			
DAY 2 (14 JUNE 2011)				
(Four panels run simultaneously, with coffee/tea breaks and lunch between the sessions)				
0900-1700	Panel 1 Enhancing Governance in Fishery Management	Panel 2 Sustainable Aquaculture Development	Panel 3 Ecosystem Approach to Fisheries	Panel 4 Post-harvest and Safety of Fish and Fisheries Product
DAY 3 (15 JUNE 2011)				
(Four panels run simultaneously, with coffee/tea breaks and lunch between the sessions)				
0900-1700	Panel 5 Emerging Requirements for Trade in Fisheries Product	Panel 6 Climate Change Adaptation & Mitigation Towards Food Security	Panel 7 Livelihood among Fishing Communities and Prospects of Employment in Fisheries-related Activities (monitoring of change)	Panel 8 Sustaining Food Supply from Inland Fisheries
DAY 4 (16 JUNE 2011)				
0900-1030	Plenary II: Overview of the Sustainable Fisheries for Food Security Toward 2020 (Based on the outcomes of the Panel discussions)			
1030-1100	Coffee/Tea Break			
1100-1230	Plenary III: Fisheries Cooperation in the ASEAN Region: Vision of Cooperation in the			

	Region Towards 2020
1200-1330	Lunch Fisheries SOM Working Lunch (to sort out logistic arrangements for Ministers, and the outcomes from the Technical Panel Session)
1330-1430	ASEAN-SEAFDEC Senior Officials Meeting Plus Three (Fisheries SOM Plus Three) (by invitation) <ul style="list-style-type: none"> • Outcomes from the Conference Technical Session • Discussion on policy to support the long term cooperation and partnership in fisheries
1430-1530	ASEAN-SEAFDEC Senior Officials Meeting (Fisheries SOM) (by invitation) <ul style="list-style-type: none"> • Discussion on the Resolution and Plan of Action • Discussion on Concept Note
1530-1600	Coffee/Tea Break
1600-1700	ASEAN-SEAFDEC Senior Official Meeting (Fisheries SOM) (cont'd)
DAY 5 (17 JUNE 2011)	
	Ministerial Breakfast (To discuss the arrangements for Ministerial Session)
0900-1230	Ministerial Session (by invitation) <ul style="list-style-type: none"> • Inauguration Session • Report from the Chairperson of SOM • Ministers intervention (5-10 minutes to be allocated to 11 Ministers) • Statement by stakeholders, <i>e.g.</i> representatives from private sectors and civil society
1230-1400	Lunch
1400-1530	Concluding Session (Open Session by invitation) <ul style="list-style-type: none"> ○ Statement by the Chairperson of the Ministerial Session on behalf of all Ministers ○ Closing Remarks
1430-1500	Coffee/Tea Break

(The Detailed Conference Themes/Sub-Themes to be discussed at the Panel Session (Day 2 and Day 3 appears as **Appendix 3**; and the description and detailed information of the technical panel appears as **Appendix 4**)

Side Events:

In parallel with the Conference, side events are being planned as follows:

- Technical exhibitions/displays by SEAFDEC and the ASEAN-SEAFDEC Member Countries
- Exhibition of drawings from the contests organized by each ASEAN-SEAFDEC Member Countries (4 best drawings from each country would be exhibited)
- Other Side-meetings (to be conducted by other organizations at the end of Day 2 and Day 3)
- Post-Conference Study Tours
- Receptions
 - Conference Reception Dinner hosted by DOF (Day 1)
 - Conference Reception Dinner hosted by SEAFDEC (Day 2 or 3)
 - SOM Dinner hosted by DOF (Day 3)
 - Ministers' Dinner hosted by DOF (Day 4)

TECHNICAL PANELS: THEMES AND SUB-THEMES
(As of 15 October 2010)

Followings are the tentative themes and sub-themes (subject to change) to be discussed during the Panel Session (Day 2 and 3 of the Conference):

Theme 1: Enhancing Governance in Fishery Management

- Can Small-scale and Commercial Fisheries Co-exist?
- Management of Fishing Capacity
- Co-management
- Application of Global Instruments and Regional Agreements

Theme 2: Sustainable Aquaculture Development

- Meeting Social and Economic Challenges of Aquaculture
- Quality Seed Production for Sustainable Aquaculture
- Healthy and Wholesome Aquaculture
- Maintaining Environmental Integrity through Responsible Aquaculture

Theme 3: Ecosystem Approach to Fisheries

- Ecosystem Interventions
- Resources Enhancement and Habitat Improvement
- Reduction of Impacts from Fishing on Marine and Coastal Environments

Theme 4: Post-harvest and Safety of Fish and Fisheries Product

- Improving Fish Handling Processing and Preservation
- Improved Traditional Products - quality, marketing and trade
- Quality, Safety and Control Systems for Fish Products

Theme 5: Emerging Requirements for Trade in Fisheries Products

- Required, compulsory actions (including Traceability, Enhanced monitoring, Certification, Catch documentation, and Certification)
- Trade facilitation/supply chains (including Voluntary schemes, Fisheries eco-labelling, Branding (promoting specific brand), and Fair Trade Certification)

Theme 6: Climate Change Adaptation & Mitigation Towards Food Security

- Impacts of Climate Change to fisheries and aquaculture(including Consequences for marine life conservation and aquaculture production, consequences for livelihood)
- Adaptation to the Climate Change (including Restoring and maintaining protective coastal/inland landscapes/habitats, Assessing and improving energy consumption, and Identification of capacity needed to adapt to climate change)

Theme 7: Livelihood among Fishing Communities and Prospects of Employment in Fisheries Related Activities – options for improvement and monitoring of change

- Social and economic aspects of an ecosystems approach to fisheries
- Monitoring and record of social aspects, migratory labor (fishing crews, factory laborers, fishers, etc.)
- Meeting social and economic challenge building capacity to adapt to change (e.g. poverty alleviation, alternative/ supplementary livelihoods, FOVOP, etc)



- Social rights, social security and labor (including Social rights and social security in traditional small-scale fisheries, and Social rights and social security among migratory fishers at larger vessels)
- Safety at sea for small-scale fisheries

Theme 8: Sustaining Food Supply from Inland Fisheries

- Safeguarding Food Security
- Sustainable Development of Inland Fisheries
- Towards Sustainable Co-management in Inland Fisheries
- Integrating Fisheries with Multiple Inland Water Resources Use

DESCRIPTION & DETAILED INFORMATION OF TECHNICAL PANELS

< updated 15 October 2010 >

1) THEMATIC TITLE: ENHANCING GOVERNANCE IN FISHERY MANAGEMENT

1.1 **Coordinating Department:** SEAFDEC-MFRDMD, TD

1.2 **Partner Organization(s)/Institution(s):** FAO, WorldFish Center, DOF Malaysia, Coastal Development Center/Kasetsart University, AIT, Research Institutions from Japan and, International Coastal Network- Memorial University

1.3 **Subthemes/Issues:**

- Can Small-scale and Commercial Fisheries Co-exist?
- Management of Fishing Capacity:
 - Strengthen Monitoring, Control and Surveillance, combat IUU fishing (*e.g.* enhance monitoring system, vessel and gear record and inventory (data), etc.)
- Co-management
- Application of Global Instruments and Regional Agreements

1.4 **Description of Theme :**

Background:

Fishing activities has been in existence in this region for ages. Millions of people in this region still rely on fishing and fish for their income and nutritional quality of their diet. However, research has shown that marine fish biomass in the region is now down to 8 to 12% of pre fishing levels. About 88% of the coral reefs are estimated to be at risk from human damage, particularly overfishing. With this deteriorating state of fishery resources and the emerging fisheries-related issues during the past decade, the need to urgently solve the problems of achieving sustainable fisheries development and food security becomes critical. Weak governance is said to be the main underlying cause of overfishing. Fishery governance establishes the overriding principles and objectives of the sector. Governance which encompasses the institutional arrangements for the stakeholders in the society to extract fishery resources will determine how well societal problems are resolved and opportunities are created for enhancing social welfare. Good governance includes the formulation and application of principles guiding those interactions and care for institutions that enable them.

Good governance requires the establishment, in a transparent and participatory fashion, of the most appropriate balance between short- and long-term objectives, between small-scale and industrial sectors and between maximization of income from license fees and long-term sustainability of the resources. Good governance also requires support for the developing world in the negotiation, implementation, and control of the fisheries agreements, ensuring that the interests of their domestic industries are adequately protected.

This theme will pave the ways forward to enhance the role of governance in managing fisheries in this region. Enhancing governance could be implemented in the context of an ecosystem approach. The ecosystem approach is clearly articulated in the Code of Conduct for Responsible Fisheries (CCRF), adopted in 1995 by the FAO member states. The CCRF provides an internationally accepted set of principles and guidelines for governance and best practices in fisheries development and management. Other instruments of relevance to this region, includes the four International Plans of Action (IPOAs) on management of fishing capacity, on

conservation and management of sharks, on reducing the incidental catch of seabirds, and on illegal, unreported, and unregulated (IUU) fishing.

Highlight the importance of Theme

- **Can small-scale and commercial /industrial-scale fisheries co-exist?**

The FAO Code of Conduct for Responsible Fisheries (CCRF) underwrites the ecosystem approach as well as the precautionary approach to capture fisheries. CCRF also emphasizes the contribution of one specific human category, small-scale fishers, to employment, income and food security, as well as the need to protect their rights to a secure and just livelihood. In tropical fisheries like those of this region, many fishing units using different fishing gear types and with different scale operations target the same fish stocks and hence competing for a share of the catch. Overfishing of one species by the industrial/commercial sector might threaten the yield of other species in the food chain. Therefore, the sustainability problems of capture fisheries subsectors can be solved, only by holistic approach, recognizing the sharing of resources among different scales of fishing and their interactions. In this case, efforts to govern the small-scale fisheries would have to include the industrial/commercial fisheries as well.

The session on the sub-theme ‘How can small-scale and industrial/commercial-scale fisheries co-exist’ will: (Also for panel discussion)

- a) Examine the existing rules, structure and enabling environment in the region that govern management of the aquatic resources for the benefit of both small-scale and commercial-scale fisheries
- b) Evaluate the willingness of the fishers/communities both in small-scale and commercial-scale fisheries to be involved in, and accept responsibility for managing the fisheries.
- c) Identify ways to enhance the existing governance and/or propose formulation and application of principles guiding those interactions and care for co-existence of the small-scale and industrial fisheries.

- **Management of fishing capacity**

To further enhance the effectiveness of governance in fisheries management, rights and institutions that surround these rights, need to create a set of incentives that encourage limiting fishing effort to what is consistent with the sustainable exploitation of the resources. Although, governance in fisheries management requires restrictions to open access it is still not sufficient to ensure its effectiveness. Therefore, even where these types of rights exist, their enforcement is still necessary.

One of the key features for an effective fisheries management process involves the implementation of Monitoring, Control and Surveillance (MCS) programs. However, MCS in the Southeast Asian countries pose greater challenges as more than 90% in the fishing industry is comprised of small-scale fisheries. Therefore, successful implementation of MCS programs requires innovative arrangements that involve fishers at a local level in the design and implementation of the program. Furthermore more environmentally conscious, precautionary and participative forms of fishery governance are emerging which requires that commitment, legitimacy, credibility, transparency, performance assessment, equity, traditional values, integration, coordination, adaptive and affordable elements to be taken into consideration.

The session on the sub-theme ‘Management of fishing capacity’ will: (also for panel discussion)

- a) Identify the existing level of involvement of key stakeholders/resource users in sharing the responsibility for managing fishing capacity (with the authority).

- b) Identify factors that support the participation and extent of sharing the responsibility by resource users.
- c) Suggest ways to enhance participation and interaction of key stakeholders to promote governance in the management of fishing capacity.

- **Co-management**

Many social scientists believe that improved governance with strong elements of self-governance, co-management, and community based management are likely requirements for effective management. The underlying logic for this approach is the increased credibility for the rule structure, the ability to negotiate new rule structures and the positive effects of self-governance on rule compliance.

The sharing of responsibility between fishers and government is particularly important in this region, where the large numbers of fishers use multiple gears to target multiple species. Co-management systems require significant extension, education, and awareness of all fisheries stakeholders, including government and technical assistance activities to empower communities and stakeholders to participate in the governance of sustainable fisheries.

The session on the sub-theme 'Community-based Fisheries Management/Co-management' will:

- a) Examine existing co-management practices in the region and their degree of involvement in managing coastal fish resources.
- b) Identify levels of indigenous capacity and knowledge in fishery resources management and the government willingness to share power.
- c) Identify factors and conditions of best practice of co-management in the region for successful self-governance and co-management.
- d) Suggest ways to enhance Community-based Fisheries Management/Co-management.

- **Application of Global instruments and Regional Agreements**

Increasing numbers of instruments designed to ensure sustainable development and management of fisheries at the global level have brought together countries in this region in a common stand in complying with those instruments. This needs to take into account the unique dominance of the small-scale fishery sector that exploits the multi-species fishery resources of the region.

Certification programs such as European Community (EC) Catch Certification Scheme to prevent, deter and eliminate Illegal, Unreported and Unregulated (IUU) fishing have potential in promoting sector sustainability and ensuring food security in this region. This initiative is strongly supported by the new legally-binding instrument on Port State Measures developed by FAO. Other international instruments include Fisheries Subsidies under the World Trade Organization (WTO), the listing of commercially exploited aquatic species to the Appendices of the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES) and associated certification processes. Third party certification such as Marine Stewardship Certification (MSC), certifying fisheries compliance with environmental criteria includes the quality of the management system, stock conditions, and ecosystem impact in securing world-wide acceptance of fisheries products. Internationally, compliance with food safety standards also becomes critical. Therefore, countries in this region have to enhance the governance of the fisheries sector in order to increase compliance with all global instruments and regional agreements.

The session on the sub-theme Application of global instruments and regional agreements will:

- a) Assess the level of awareness and compliance of the existing international and regional instruments/ agreements that affect the fisheries in the region.
- b) Evaluate the capability of the existing mechanisms in complying with global and regional instruments/agreements.
- c) Identify factors and constraints that are likely to hinder in compliance with these agreements.
- d) Suggest ways to enhance the governance in order to improve the application/compliance with international and regional instruments/ agreements.

• **Expected recommendations, resolution and plan of actions:**

<To be developed after the **RTC on Sustainable Fisheries Management** held in October 2010, and Inputs from National Seminars>

2) THEMATIC TITLE: SUSTAINABLE AQUACULTURE DEVELOPMENT

2.1 Coordinating Department: Aquaculture Department

2.2 Partner Organization(s)/Institution(s): FAO/RAP, NACA, WorldFish Center, SEAFDEC/MFRD

2.3 Subthemes/Issues:

- Meeting Social and Economic Challenges of Aquaculture
- Quality Seed Production for Sustainable Aquaculture
- Healthy and Wholesome Aquaculture
- Maintaining Environmental Integrity through Responsible Aquaculture

2.4 Description of Theme :

Background

It was projected that by 2020, the total per capita consumption of food fish in Southeast Asia will reach 25.8 kg/year. It was predicted that aquaculture will continue to grow and meet the deficit in food fish needs. However, the tasks ahead are daunting and challenges will have to be met in order for the sector to grow sustainably and effectively contribute to fisheries development in the region.

Last 17-19 March 2010, the Southeast Asian Fisheries Development Center Aquaculture Department (SEAFDEC/AQD), in cooperation with the SEAFDEC Secretariat, convened the Regional Technical Consultation (RTC) for Sustainable Aquaculture Development of Southeast Asia Towards 2020 in Bangkok, Thailand. The RTC participants reviewed the developments of aquaculture after the 2001 ASEAN-SEAFDEC Millennium Conference on Fisheries and defined preliminary strategic actions under various themes for the region's sustainable aquaculture development in the next decade.

This thematic session is a step towards the final formulation of a roadmap for sustainable aquaculture development in the region for the next ten years. Using the outcomes of the RTC on Aquaculture, the present session will: i) formulate strategies that will help meet the current and emerging socio-economic challenges of aquaculture in Southeast Asia; ii) identify means to address emerging and potential issues related to production of quality seed for sustainable aquaculture; iii) outline good practices to achieve healthy and wholesome aquaculture; and iv)

identify measures on how the aquaculture sector could further promote the sustainability of the environment and respond to the threat of climate change.

Issues to be Addressed

- **Meeting Social and Economic Challenges of Aquaculture in Southeast Asia**

Ten years into the 21st century, aquaculture is still confronted with issues on equity in terms of opportunities and the distribution of benefits that fall short in addressing food security and livelihood of small-scale sector stakeholders.

This session will discuss the social and economic challenges in the promotion of rural or small-holder aquaculture in the ASEAN and steps that need to be taken to address them. This includes, among others, capacity building, access to capital as well as markets, policies and governance, and seeking avenues for aquaculture as an option for improving resilience of fish farmers and fishers to the impacts of climate change. The recommendations and plan of actions are expected to cover aspects that will: i) enhance the role of aquaculture in improving the livelihood and food security at all levels (local, national and regional); ii) support the sustainability of the environment and resources; and iii) identify relevant policies, infrastructure and linkages that will make the Member Countries better equipped in meeting the socio-economic challenges in the next 10 years.

- **Quality Seed Production for Sustainable Aquaculture**

Supply of quality seeds is a pre-requisite for sustainable development of aquaculture. The session on the sub-theme 'Quality Seed Production for Sustainable Aquaculture' will discuss the recent and current seedstock production issues that require attention, and will finalize the recommendations on how to further enhance aquaculture production in the region in the next decade through reliable supply of better quality seedstock. The session is expected to come up with action plans that will address the research and development needs associated with the environmental and genetic requisites for better quality seed, maintenance and dissemination/distribution of the improved stocks, including access by a wide range of farmers and marketing.

- **Healthy and Wholesome Aquaculture**

There is certainty that in the next decade, the practices which threaten food safety and concerns relating to the impact of aquaculture on the ecosystem will continue. To assist the Member Countries in addressing the problem, SEAFDEC has been promoting the concept 'healthy and wholesome aquaculture'. The concept, which was adopted as part of the Resolutions during the 2001 ASEAN-SEAFDEC Millennium Conference on Fisheries, is a holistic approach to fish disease management for food safety and security. It also promotes the use of efficient feeds (cost effective and low polluting) to optimize production of robust and healthy farmed aquatic animals with the least negative impact on the environment.

The session on the sub-theme 'Healthy and Wholesome Aquaculture' will revisit priority areas on disease prevention and control, food safety and environmental integrity that were identified during the first Fish for the People Conference in 2001 and the RTC on Aquaculture held in March 2010.

The recommendations and plan of actions are expected to cover the following aspects: a) disease diagnosis, monitoring and surveillance and control; b) fish meal substitutes (especially for small-scale aquaculture) and feeding management; c) environment as determinants of fish health and quality, and health certification and quarantine; and d) good aquaculture practices and

implementation of these in Member Countries. The session will also include the capacity and affordability of a wide range of farmers to adopt such practices.

- **Maintaining Environmental Integrity through Responsible Aquaculture**

Despite the progress on SEAFDEC initiatives that promote the Code of Conduct for Responsible Fisheries, the aquaculture sector in the region is still confronted with issues related to environmental protection and wise use of resources. The session on the sub-theme will discuss environmental monitoring of water and sediment quality associated with ponds, net cages, and pens to ensure productivity and sustainability as well as minimizing the adverse impacts of and adaptations to climate change. Research needs and strategic actions on aquaculture that will promote the environmental sustainability of the region in the next 10 years will be reviewed and finalized.

- **Expected recommendations, resolution and plan of actions:**

<To be developed after the **RTC on Sustainable Aquaculture Development** held in March 2010, and Inputs from National Seminars>

3) **THEMATIC TITLE: ECOSYSTEM APPROACH TO FISHERIES**

3.1 Coordinating Department: SEAFDEC/ Training Department

3.2 Partner Organization(s)/Institution(s): DOF-Thailand, FAO, BOBLME, MRC, Research Institutions and Academy from Japan

3.3 Subthemes/Issues:

- Ecosystem Interventions (*e.g.* fish *refugia*, protected areas, integration/harmonization of fisheries and habitat management, biodiversity, etc.)
- Resources Enhancement and Habitat Improvement (*e.g.* restocking, artificial reefs, rehabilitation of mangroves, coral reefs, sea grasses, wetlands, freshwater reservoirs, etc.)
- Reduction of Impacts from Fishing on Marine and Coastal Environments

3.4 Description of Theme :

Background

Ecosystem-based management can be an important complement to existing fisheries management approaches. When fisheries managers understand the complex ecological and socioeconomic environments in which fish and fisheries exist, they may be able to anticipate the effects that fishery management will have on the ecosystem and the effects that ecosystem change will have on fisheries. A comprehensive ecosystem-based fisheries management approach would require managers to consider all interactions that a target fish stock has with predators, competitors, and prey species; the effects of weather and climate on fisheries biology and ecology; the complex interactions between fishes and their habitat; and the effects of fishing on fish stocks and their habitat. However, the approach need not be endlessly complicated. An initial step may require only that managers consider how the harvesting of one species might impact other species in the ecosystem. Fishery management decision made at this level of understanding can prevent significant and potentially irreversible changes in marine ecosystems caused by fishing. There are two requirements for managing human interactions with marine ecosystems. One is to develop an understanding of the basic characteristics and principles of these ecosystems, what patterns of distribution and abundance they exhibit and how these systems function in space and time. The second is to develop an ability to manage human activities that impact marine ecosystems,

consistent with sustainability of ecosystem diversity and with societal goals concerning the kinds of benefits that society derives from these ecosystems.

Today, humans are a major component in most ecosystems. The human component of the ecosystem includes the humans themselves, their artifacts and manufactured goods (economic), and their institutions and cultures. The human imposition of fishing mortality, at rates often higher than natural mortality, can have major impacts not only on targeted species but on the ecosystem itself.

The concept and rationale of ecosystem-based management of fisheries takes into account the interrelationships between the planet's web of life and ongoing human action. Although specific reference to ecosystem management only appears in relation to rare or fragile ecosystems, the provisions on fisheries management describe ecosystem like considerations to be taken into account, such as associate and dependent species, interdependence of stocks and minimum standards at all levels. (Ecosystem Principles Advisory Panel. 1996)

Highlight the importance of Theme

- a) Research/existed information review required to support fisheries management
- b) Ecosystem interventions: fish *refugia*, marine protected areas, integration/harmonization of fisheries and habitat management, biodiversity, etc
- c) Resource Enhancement and habitat Improvement : restocking, artificial reefs, rehabilitation of mangroves, sea grasses, coral reefs, wetlands, freshwater reservoirs, etc.)
- d) Reduction of Impacts from Fishing on Marine and Coastal Environments.

How the theme link to sustainable fisheries

- a) Research/literature review: The identification of the Principles and associated management Policies reflects a vast amount of scientific knowledge about marine ecosystems and their relationship to humankind. To more fully benefit from the application of the Principles and Policies, there is an urgent need for a better understanding of ecosystem processes in general, and about the state and dynamics of specific ecosystems. There are research and or information review aspects that needed to be done: 1) Determine/Delineate the regimes of each ecosystem intervention; 2) Determine the exits resource enhancement and habitat improvement benefit of fish stock; and 3) Determine the coastal and marine ecosystems impacts/effects of fishing.
- b) Ecosystem interventions: The ecosystems supporting fisheries and the way in which fisheries are managed within them will vary according to their individual characteristics. Fisheries management needs to develop and encompass zone-based management regimes. In a zoning approach, geographic areas within an ecosystem would be reserved for prescribed uses. For example, use of gears which are demonstrated to have an adverse effect on ecosystems interventions could be limited to prescribed areas. A zone-base approach could also limit fishing activities in areas where potential negative trophic impacts could occur. A zoning approach should also include the establishment of marine protected areas. Moreover, the complete protection of relatively large portions of marine ecosystems, in the form of harvest *refugia*, may provide the best way to characterize habitat needs and also serve as management tools.
- c) Resource enhancement and habitat improvement: Ecosystems serve as important sources of recruitment to, and the sustainability of, commercial fish stocks. However, many areas of critical habitat have been destroyed hence it has been suggested on many occasions that resource enhancement and habitat improvement through restocking, artificial reefs, rehabilitation of mangroves, sea grasses, coral reefs, wetlands, freshwater reservoirs should take places. The potential benefits of these actions could be an increase in aquatic biodiversity and enhanced productivity of fisheries resources which can contribute to food and economic security.

- d) Reduction of Impacts from Fishing on Marine and Coastal Environments. Globally, many fish species are over-exploited, and many stocks have collapsed. This crisis, along with increasing concerns over flow-on effects on ecosystems, has caused a re-evaluation of traditional fisheries management practices, a new ecosystem-based fisheries management paradigm has emerged. As part of this approach, selective fishing is widely encouraged in the belief that non-selective fishing has many adverse impacts. In particular, incidental by-catch is seen as wasteful and a negative feature of fishing and methods to reduce by-catch are implemented in many fisheries. However, recent advances in fisheries science and ecology suggest that a selective approach may also result in undesirable impacts both to fisheries and marine ecosystems. Selective fishing applies one or more of these selections: species, stock, size, sex, season, and space. This concept may require reducing exploitation rates on certain target species or groups to protect vulnerable components of the ecosystem. Socio-economic benefits could be maintained or even increased because a greater proportion of the entire suite of harvested species is used (Shijie Zhoe *et al.*, 2009).

Expected recommendations, resolution and plan of actions:

- a) Develop a Fisheries Ecosystem Plan for the region
- b) Measures to and for implement the fishery ecosystem interventions and habitats improvement
- c) Prepare guidelines for Fisheries Ecosystem Plan for the region
- d) Explore ecosystem-based approaches to government

<To be developed after the **RTC on Sustainable Fisheries Management** held in October 2010, and Inputs from National Seminars>

4) THEMATIC TITLE: POST-HARVEST AND SAFETY OF FISH AND FISHERIES PRODUCT

4.1 Coordinating Department: Marine Fishery Research Department

4.2 Organization(s)/Institution(s):

- Organizations: FAO, SEAFEC/TD
- Member countries: BFAR, DOF Thailand, DOF Malaysia, Ministry of Marine Affairs and Fisheries (Indonesia), AVA (Singapore), NAFIQVED (Vietnam),
- Institutions: Nha Trang University (Vietnam), Chulalongkorn University (Thailand), Suranaree University of Technology, Oregon State University, Tokyo University of Marine Science and Technology, National Research Institute of Fisheries Science (Japan)

4.3 Subthemes/Issues:

- Improving Fish Handling, Processing and Preservation
- Improved Traditional Products - quality, marketing and trade
- Quality, Safety and Control Systems for Fish Products

4.4 Description of Theme :

The post-harvest sector is extremely important in fisheries, from fishermen's handling the catch on-board to handling, processing, distribution and marketing of the catch on-shore. It involves providing full-time and part-time employment for millions of people, a great many of which are women, and generates fish as food by subsistence consumption or cash sale. It also contributes to

income generation through the sale and resale of fresh fish for food or processing; either traditional or value-added for food, or industrial processing and outgrowth of alternate food products (chicken, fish, shrimp), and contributes to foreign currency generation. In view of the current state of fisheries and increasing population in the region, per capita consumption of fish will probably decrease over the next decade. Currently most fish within the region is utilized, but much of the catch landed is of poor quality and is utilized for non-human consumption or very low-valued products. This theme will look at methods of optimizing the utilization of fish catch, so that those involved may receive a greater value for their product, or that the quality of the catch is raised so that more of the product could go for human consumption. Technical innovation has changed the fishery in the past as exemplified by the development of surimi which has transformed a group of low-valued fish into a value-added industry. Fish is a major source of animal protein and in most ASEAN countries 30 - 45% of fish landed are converted into traditional fish products. This is important for food security as most of it goes to the lower income socio-economic classes and plays a vital role in their diet. There is opportunity for expansion of this sector, but aspects of quality, safety, and marketing such products have to be explored. Finally, safety and quality of fish and fish products are of concern throughout the catching, handling, processing and distribution chains for both domestic and export markets. Quality, safety and control systems have to be established for SME's, particularly if they want to export products. While such systems exist for larger industries and government, there are still issues to be resolved, particularly in the areas of harmonization of standards and in developing equivalency between countries for food/fish import and export inspection and certification systems.

Highlight the importance of Theme

The sub-theme on improving the Fish Handling, Processing and Preservation, will look at ways technology may further stimulate demand for higher quality and improve economic returns, and reduce wastage of fish and fishery products.

The sub-theme Improved Traditional Products - quality, marketing and trade, will look at ways to improve and develop this sector.

The sub-theme Quality, Safety and Control Systems for Fish and Fisheries Products will encompass the development of quality/safety management/control systems for SME's, including traditional and value-added products; and developing equivalency agreements between countries for the import/export of fish and fishery products. This involves activities such as harmonization of standards, inspection and auditing procedures; coordination of national regulations and government bodies; laboratory testing and certification; and control system training and implementation within the region. It also includes developing a mechanism to coordinate these activities at national, regional and international levels.

How the theme link to sustainable fisheries?

This theme is important for all ASEAN governments in the areas of poverty alleviation, food security, foreign exchange, and food safety. The links are given in the description of the theme.

How industry involve in sustainable fisheries for food security towards 2020?

Industry has to apply any innovative technology developed and needs a quality/safety management/control system to operate.

Expected recommendations, resolution and plan of actions:

<To be developed after the **RTC on Issues related to Post-harvest and Safety of Fish and Fishery Products** held in July 2010, and Inputs from National Seminars>

5) THEMATIC TITLE: EMERGING REQUIREMENTS FOR TRADE IN FISHERIES PRODUCT

5.1 **Coordinating Department:** SEAFDEC/ Secretariat

5.2 **Partner Organization(s)/Institution(s):** FAO, ASEAN, Sustainable Fisheries Partnership, Fishery Research Agency, Japan

5.3 **Subthemes/Issues:**

- Required, compulsory actions
 - Traceability
 - Enhanced monitoring
 - Certification
 - Catch documentation
 - Certification
- Trade facilitation/supply chains
 - Voluntary schemes
 - Fisheries eco-labelling
 - Branding (promoting specific brand)
 - Fair Trade Certification

5.4 **Description of Theme:**

Background

During the last 5-10 years the fishing industry has seen some dramatic changes in terms of requirements to guarantee good quality, healthy products and other aspects that could indicate that the product is safe for human consumption. In addition there are increasing demands with regards to the production and production methods and producers have to guarantee/certify that all steps of the production are in line with acceptable environmental standards and that the production can be sustained including important habitats. To be able to manage the fisheries there is a regional/ASEAN and global call to combat IUU Fisheries – the binding agreement of Port State Measures and EU’s requirements for catch documentation are testimony to this. The trends, and emerging requirements, are not only looking at quality and environmental sustainability but increasingly also including requirements to certify fair trade standards as well as social and labor related standards.

Highlight the importance of Theme

The theme addresses the central aspects of trade in fish and fisheries products which, given the importance of the sector to the countries of the region, is vital to the economies and well-being of the people. The emerging requirements are also central to maintaining and improving the well-being of ecosystems and habitats, to sustain the fisheries and to combat illegal fisheries. These are all issues that underpin sustainable fisheries and food security.

How the theme link to sustainable fisheries

This is already referred to above but the way some of these requirements are framed (and justified) is to provide “tools” for both environmentally and socially sustainable fisheries

How industry should be involved in sustainable fisheries for food security towards 2020

As available and emerging requirements are addressing all steps in the fishing industry from the catches and catch/harvesting methods through factories and traders to the retailers in the region or

globally it is obvious that these aspects need to be considered (and implemented) by all parties in the fishing industry.

Expected recommendations, resolution and plan of actions

- Could be good to come back to this after the first round of comments is received (it could be something already available within ASEAN or elsewhere but not really known to the normal fisheries “audience”)
- Enhance monitoring, traceability, catch certification

<Others will be developed after the RTC on Adaptation to the Changing of Environment held in November 2010, and Inputs from National Seminars>

6) THEMATIC TITLE: CLIMATE CHANGE ADAPTATION & MITIGATION TOWARDS FOOD SECURITY

6.1 Coordinating Department: SEAFDEC/Training Department

6.2 Partner Organization(s)/Institution(s): ASEAN, Environment Agencies, Fisheries Agencies, FAO, MRC, NACA, SEA-START, SENSEA, WorldFish Center, Universities, WWF, etc.

6.3 Subthemes/Issues:

- Impacts of Climate Change to fisheries and aquaculture
 - Consequences for marine life conservation and aquaculture production
 - Consequences for livelihood
- Adaptation to the Climate Change
 - Restoring and maintaining protective coastal/inland landscapes/habitats
 - Assessing and improving energy consumption (e.g. recording number and types of fishing vessels, etc.)
 - Identification of capacity needed to adapt to climate change (what and where), e.g. enhancing safety at sea and rescue, etc.

6.4 Description of Theme:

Background:

The fisheries sector plays a very important role in the national economies of all Southeast Asian nations particularly in providing livelihoods and food security for the people in the ASEAN Region as it has been the main supplier of food protein for the people in all the ASEAN Member States (AMSs). For a number of years, global concern on climate change has called for attention on the potential impacts from global warming or climate change including its impact on the fisheries sector. Climate change already affects Southeast Asia, through an apparent increase in frequency and intensity of extreme weather with huge consequences *i.e.* flooding and sea water rises, change of water temperature, change in species composition and distribution, coral bleaching, increase in storms and cyclones, etc. Moreover the Southeast Asian region is one of the world’s most vulnerable regions to climate change, due to its long coastlines, high concentration of population and economic activity in coastal areas and heavy reliance on agriculture, fisheries, forestry and other natural resources. These aspects, high vulnerability, large populations, coastal vulnerability, etc should also be seen in the perspective of immediate needs to improve management, restore important and protective habitats and to provide alternative and diversified incomes.

In the ASEAN Region, climate change is a compounding threat to the sustainability of capture fisheries and aquaculture development as it has impacts on ecosystems, and livelihoods; and implications for food security. Urgent adaptation and mitigation measures are required in response to opportunities and threats to food and livelihood provision due to climate variations. To address the issue of long-term food security in the ASEAN region in accordance with the ASEAN Integrated Food Security (AIFS) Framework, a Strategic Plan of Action (SPA-FS) was adopted by the ASEAN Leaders at the 14th Summit in March 2009. This action plan addresses issues regarding the impacts of climate change on food security; as does the recently developed “ASEAN Multi-Sectoral Framework on Climate Change: Agriculture, Fisheries and Forestry Towards Food Security” (AFCC Framework), which was agreed at the ASEAN High-Level Workshop on the ASEAN Multi-Sectoral Framework on Climate Change and Food Security held in September 2009. A program on “Climate Change and its Impacts on Fisheries and Aquaculture: Adaptation and Mitigation towards Food Security” has been initiated and will be implemented in the ASEAN Region under the ASEAN-SEAFDEC Strategic Partnership (ASSP). These arrangements will provide a regional framework for cooperation and coordination on climate change issues relevant to fisheries and food security in the ASEAN Region.

Highlights the importance of Theme

- ❖ Understanding:
 - Health effects of climate change
 - Direct: deaths and illness due to thermal extremes; injury resulting from floods and storms; etc.
 - Indirect: more widespread infections of diseases; respiratory effects of worsening air pollution, poor nutrition due to agriculture disruption; ill-health due to social dislocation and migration.
 - Climate change is anticipated to have widespread impacts to all coastal zones which are at risk to the impacts of accelerated global sea-level rise and other coastal implications of climate change, such as changing storm frequency;
 - Climate change may threaten eco-system health in a number of important ways, including accelerating irreversible change such as through loss of species and of habitats (*e.g.* coral reef systems, coastal and deep-sea fishery resources, changes in inland wetlands and flood plain dynamics, etc.)

- ❖ Requirements and how to?
 - Proactive perspective towards coastal hazards and changing levels of risk;
 - (Low-cost) Measures to maintain or increase future flexibility of response to climate change need to be identified and implemented as part of an integrated approach to coastal management;
 - Give increased attention to solve existing problems such as degradation and reduction of important habitats, reduction of over-capacity (reduce energy consumption), improved organizational structures among coastal and inland communities (strengthen resilience and adaptive capacity), improve safety at sea and rescue at sea, etc.

How the theme link to sustainable fisheries:

- Climate change can induce changes in: temperature, water supply and quality and will impact on agricultural production, human settlement and health, biodiversity and animal migratory patterns. These are important factors for sustainable development particular to the developing countries where their natural resources (including fishery) are vulnerable to such changes.
- Management measures to integrate fisheries and habitat management, to restore and conserve important habitats, to reduce over-capacity, to reduce destructive fishing and to build up management capacity among fisher-folk (smaller and larger scale)

are all measures that needed to sustain fisheries. The improved management and improve organizational structures building upon cooperation among various parties and sectors will also strengthen the adaptive capacity and restore and maintain habitats that may mitigate against possible adverse impacts.

Expected recommendations:

- Component 1 Strengthen capacity in tackling the impacts of climate change and development of adaptive needs
 - Facilitate development of a long-term policy in response to the immediate and emerging needs relevant to potential impacts of climate change. Promote awareness on climate change and its impact to fisheries and aquaculture. Build up the resilience of fisheries communities in response to their present needs and build up adaptive capacity to address perceived impacts of climate change. Mainstream policy on poverty alleviation, including remedial actions for people potentially affected impacts of climate change.
- Component 2 Integrate climate change into fishery policy framework and programs on sustainable development and management of fisheries for food security
 - Review existing national plans and programs/actions to accommodate the issues on climate change and its impacts on fisheries/aquaculture policy framework and program. Conduct national seminar/workshop involving relevant stakeholders to facilitate development of national fisheries policy and actions plans on climate change and fisheries/aquaculture for food security. Identify and develop appropriate indicators for assessing and monitoring impacts of climate change on fisheries resources, habitats, and aquaculture.
- Component 3 Minimizing impacts from fisheries and aquaculture to climate change
 - Undertake energy saving measures and promote the use of alternative source of energy. Promote the full utilization of low-economic value fish species.
- Component 4 Inter-agency coordination on climate change
 - Encourage inter-agency coordination and sharing/mobilization of expertise and resource persons to reduce emission from fisheries and aquaculture. Facilitate sharing information specifically on adaptive measures relevant to climate change and fisheries/aquaculture.

<Others will be developed after the RTC on Adaptation to the Changing of Environment held in November 2010, and Inputs from National Seminars>

7) THEMATIC TITLE: LIVELIHOOD AMONG FISHING COMMUNITIES AND PROSPECTS OF EMPLOYMENT IN FISHERIES RELATED ACTIVITIES – OPTIONS FOR IMPROVEMENT AND MONITORING OF CHANGE

7.1 Coordinating Department: SEAFDEC/Training Department

7.2 Partner Organization(s)/Institution(s): ASEAN countries, ICSF, SENSEA, ILO

7.3 Subthemes/Issues:

- Social and economic aspects of an ecosystem approach to fisheries
- Monitoring and record of social aspects, migratory labor (fishing crews, factory laborers, fishers, etc.)
- Meeting social and economic challenge building capacity to adapt to change (*e.g.* poverty alleviation, alternative/supplementary livelihoods, FOVOP, etc.)

- Social rights, social security and labor
 - Social rights and social security in traditional small-scale fisheries (including economic security)
 - Social rights and social security among migratory fishers at larger vessels
- Safety at sea for small-scale fisheries.

7.4 Description of Theme :

Background

Social aspects, labor requirement and the rights of coastal and inland communities to a decent livelihood are increasingly on the agenda. International conventions going back to the basic UN Human Rights Convention, the 1982 UNCLOS, IMO Conventions, ILO Conventions are together with policies by companies linked to the fishing industry and traders/retailers of fisheries products (Abba, Sweden/Norway, Wollmart, US, etc.) increasingly add requirements on social wellbeing, labor conditions. Also in the ASEAN context and in the development of ASEAN Community social aspects and labor movements are key issues to consider. Subsequently, fisheries management in the period up to 2020 is not only to manage the “fish” but the well-being, and the rights, of those involved (and potentially excluded) in various aspects of fisheries be it capture fisheries, trading, processing, migratory workforce etc. need to be considered.

Highlight the importance of Theme

The well-being of those involved in fisheries ranging from the coastal/inland communities, fishers/fish-workers on larger vessels, people engaged or employed in processing factories plants and/or cottage industries are the backbone of the whole fisheries sector. If the improvement in the livelihood and social well-being of all those people cannot be shown then it is likely that further sanctions and restrictions lie ahead.

How the theme link to sustainable fisheries

The sustainability of fisheries rest not only with the sustainability of the “reproductive cycle” of the aquatic resources as such but equally important the sustainability is monitoring based on the well-being (poverty situation) of all the people involved in various aspects of the fisheries and the production chain to the final consumers, locally or at regional and international markets. Specific concern, implying a need for continuous monitoring of social well-being, is the large number of coastal and inland communities that rely on fisheries products as well as the large number of migrant workers that are employed (in for them alternatives to their opportunities “at home”) on fishing boats, in factories and other aspects of the fishing industry. The regional dimension of labor mobility indicates that this is a central concern in the development of a sustainable ASEAN Community.

How industry involve in sustainable fisheries for food security towards 2020

As indicated above this requires the adoption of socially just principles, recognizing the rights of smaller communities, recognizing acceptable standards for people employed in fishing and fishing industry in addition to the management of aquatic resources as such, A different type of monitoring system might need to be developed, possibly/likely needed to be based on cooperation with institutions outside of the fisheries administration, social aspect (well-being, livelihood), economic situation, and labor conditions and mobility.

Expected recommendations, resolution and plan of actions

Could be good to come back to this after a first round of comments is received (it could be something that is already available within ASEAN or elsewhere but not really known to the normal fisheries “audience”)

- Coastal inland
- Labor on fishing vessels: an example from Philippines could be widely recommended in that to get fishing license the boat owner has to guarantee that the crew members are provided with their entitlements in accordance with Philippine Labor Laws
- Set up roadmap of monitoring system on social well-being, follow-up activities, data collection including defined indicator and benchmark to verify the system

<Others will be developed after the RTC on Adaptation to the Changing of Environment held in November 2010, and Inputs from National Seminars>

8) THEMATIC TITLE: SUSTAINING FOOD SUPPLY FROM INLAND FISHERIES

8.1 Coordinating Department: SEAFDEC/MFRDMD

8.2 Partner Organization(s)/Institution(s):

- Mekong River Commission (MRC), Vientiane,
- Department of Livestock and Fisheries Lao PDR and
- AIT

8.3 Subthemes/Issues:

- Safeguarding Food Security
- Sustainable Development of Inland Fisheries
- Towards Sustainable Co-management in Inland Fisheries
- Integrating Fisheries with Multiple Inland Water Resources Use.

8.4 Description of Theme :

Background

In tropical and temperate southern hemisphere, freshwater fishes from rivers, lakes and other wetlands are major source of protein for large part of the world’s population, particularly the low income group. Inland fisheries and aquaculture have contributed about 25% to the world’s production of fish. The bulk of the production is generated by small-scale activities, with exceedingly high levels of participation not only in catching and farming, but also in processing and marketing. According to FAO, most inland capture fisheries that depend on natural production are exploiting at or above their maximum sustainable yields. Thus 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 of many people in some countries of the Southeast Asian region that depend entirely on the inland ecosystem as source of animal protein.

Highlight the importance of Theme

• Safeguarding Food Security

Freshwater fish resources are probably among the most resilient harvestable natural resources, provided their habitats, including the quantity, timing, and variability of river flow is maintained. The fish and other living aquatic resources are often critical to local food security and many poor rural people rely on the inland fisheries as their primary livelihood strategy. The fisheries provide

direct and indirect employment opportunities (in particular for women), income and nutrition, increase household resilience and reduced vulnerability to natural hazards and economic uncertainty. Most the inland fisheries in the developing world are heavily exploited and individual species are often seriously over-exploited. Prevailing threat to the inland ecosystem 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 inland fisheries has becoming less priority importance in boosting the economic well-beings of the country. Thus sufficient knowledge is required for technical interventions to mitigate continuing damage by other users or to rehabilitate impacted inland ecosystem.

The session on the sub-theme ‘Enhancing the resilience of inland fisheries systems’ will:

- a) Examine factors that causes for non-resilience of inland fisheries systems
- b) Evaluate (if any) existing mechanisms in term of governance and strategies in enhancing the resilience of inland fisheries systems
- b) Evaluate the willingness of the fisher/community to involve and accept responsibility in managing the fisheries.
- c) Identify strategies and mechanisms to further enhance resilience of the inland fisheries systems.

• **Sustainable Development of Inland Fisheries**

Contribution of inland fisheries to the total world fish production is small in comparison with marine fisheries. However, the inland fisheries and aquaculture have contributed about 25% to the world’s production of fish. The value of freshwater production to human nutrition and incomes is much greater than gross national production figures suggest. The bulk of production is generated by small-scale activities, with exceedingly high levels of participation not only in catching and farming, but also in processing and marketing. Most inland fisheries in the developing world are heavily exploited. While the fisheries are not necessarily over-exploited in terms of gross production, individual species are often seriously over-exploited. Moreover, inland fisheries suffer greatly from environmental pressures, in particular deteriorating water quality and loss or degradation of habitats.

The session on the sub-theme ‘Sustainable development of Inland Fisheries’ will:

- a) Evaluate the status of inland fisheries production
- b) Identify ways to enhance production of inland fisheries
- c) Examine and evaluate existing mechanisms in sustainable management of the inland fisheries
- d) Identify strategies for better sustainable management of inland fisheries

• **Towards Sustainable Co-management in Inland Fisheries**

Many social scientists believe self-governance, co-management, community based management are likely requirement for effective management of inland fisheries. The community-based management of fisheries, aquaculture, and rice farming as practiced in Bangladesh and Sri Lanka is a good example of how to achieve maximum synergy through appropriate technical and management interventions. The sharing of responsibility between fishers, aquaculturists and rice farmers is particularly important especially when competing with other users for the limited water resource. Thus, Co-management systems require significant extension, education, and awareness of all fisheries stakeholders, including government and technical assistance activities to empower communities and stakeholders to participate in the governance of sustainable fisheries.

The session on the sub-theme ‘Towards sustainable Community-based Inland Fisheries Management’ will:

- a) Examine existing community-based management practices in the region and degree of involvement in managing inland fishery resources.
- b) Identify level of community including indigenous group capacity and knowledge in inland fishery resources management and the government willingness to share the power.
- c) Identify factors and conditions that co-management is likely to succeed or the pre-requisites for success implementation of co-management.
- d) Suggest ways to enhance Community-based Fisheries Management/Co-management.

• **Integrating Fisheries with Multiple Inland Water Resources Use**

Competition for water and aquatic habitat is the most critical challenge facing inland fisheries in many countries and the inland fish producers will continue to face increasing competition for water from other sources. The fishery stakeholders alone cannot address the challenges since many of the problems are generated outside the fisheries sector. Integration, better co-ordination of planning and management of resources shared by fisheries and other users, are required in order to facilitate sustainable inland fish production. The need for water to support fish and fisheries can conflict with the needs of other sectors, in particular agriculture, in both water quality and flow requirements for sustaining aquatic habitat. Decisions on water management frequently do not take into account the impact on fish and fisheries and on the rural livelihoods of the populations that depend on them. In part this is because inland fisheries are greatly undervalued in water management at local, national, and basin levels. If freshwater fish resources are to be exploited on a sustainable basis, concerted effort is needed to resolve the conflicts between users groups. Where possible, this must be based on available scientific evidence, close liaison between user groups, full cost-benefit analysis and transparency in the decision-making process. If this is to be successful, it must involve cross-education of all user groups, recognition of stakeholder participation and needs and political processes that will facilitate for integrated resource management.

The session on the sub-theme 'Integrating fisheries with multiple inland water resources use' will:

- a) Identify the existing level of involvement of all stakeholders in sharing the responsibility in managing inland water.
- b) Identify factors (*e.g.* regulation, funding, empowerment, institutions, etc.) that determine the level of participation and extent of sharing the authority by government and resource users.
- c) Suggest ways for effective management of inland water resource use

Expected recommendations, resolution and plan of actions:

<To be developed after the **RTC on Sustainable Fisheries Management** held in October 2010, and Inputs from National Seminars>

**Breakdown of Estimated Expense for the ASEAN-SEAFDEC Conference 2011
(to be supported by the ASEAN Foundation)**

1. The Conference

	ITEM	Cost (US\$)	No. person	Day(s)	Sub- total	Total
1.1	Travel expenses					34,260
	- Brunei	470	5	-	2,350	
	- Cambodia	350	5	-	1,750	
	- Indonesia	700	5	-	3,500	
	- Japan	1,200	5	-	6,000	
	- Lao PDR	400	5	-	2,000	
	- Malaysia	500	5	-	2,500	
	- Myanmar	400	5	-	2,000	
	- Philippines	710	5	-	3,550	
	- Singapore	720	5	-	3,600	
	- Thailand	-	5	-	0	
	- Vietnam	630	5	-	3,150	
	- SEAFDEC/AQD	710	2	-	1,420	
	- SEAFDEC/MFRD	720	2	-	1,440	
	- SEAFDEC/TD		2		0	
	- SEAFDEC/Secretariat		2		0	
	- SEAFDEC/MFRDMD	500	2	-	1,000	
1.2	Daily Subsistence Allowance	50	65	5		16,250
1.3	Accommodations (foreigner only)	50	61	5		15,250
1.4	Rental Fee for Conference Room/Package					22,000
	- Day 1 Plenary		65	1	8,000	
	- Day 2-3 (4 panels)		65	2	8,500	
	- Day 4		65	0.5	5,500	
1.5	Reception Dinner	75	65	1		4,875
1.6	Conference kits					3,250
	- Bags and stationary	25	65	-	1,625	
	- Conference documents and program handbook	25	65	-	1,625	
1.7	Transportations	200	-	5		1,000
	- Airport transportation services					
	- Domestic transportation (between hotels, Conference Venue, Reception dinner, etc.)					
	- Medical emergency services					
1.8	Conference Supplies	1,500	-	-		1,500
	- Supplies/facilities for Conference secretariat					
1.9	Production and Dissemination of Proceedings	30	65			1,950
1.10	Contingency (about 4%)					3,800
				Total		104,135

Appendix 6

**Contribution from Other Sources
to the Preparatory Works and the Conduct of the Conference**

In addition to the financial contribution from the ASEAN Foundation, particularly to support the participation of the representatives from the ASEAN-SEAFDEC Member Countries (5 each) and the representatives from the SEAFDEC Secretariat and Departments (2 each) to the Conference, there are also contributions and support (both in-cash and in-kind) from co-organizers and collaborative partners/organizations, *e.g.* SEAFDEC, ASEAN, the Department of Fisheries Thailand and other ASEAN-SEAFDEC Member Countries, FAO, and private sector etc., which could be tentatively identified as follows:

In-cash contribution

<i>SEAFDEC</i>	Estimated Expenses (US\$)
• Overall preparatory works and the conduct of Organizing Committee Meetings, Technical/Administrative Sub-committee Meetings, and Expert Meetings	73,600
• Organization of the Regional Technical Consultations (RTC)/Meetings to provide technical inputs to the Conference	558,500
1. Regional Training Workshop (RTW) on Community-based Freshwater Aquaculture for Remote Rural Areas of Southeast Asia	
2. Expert Meeting on Vessel Registration	
3. Regional Technical Consultation (RTC) on Biotoxins Monitoring in ASEAN	
4. 2 nd Meeting of the Regional Advisory Committee (RAC) on Fisheries Management in Southeast Asia	
5. RTW on Assessment of Fisheries Status in South and Southeast Asian Regions in collaboration with FAO	
6. RTC on Regional Cooperation in the Andaman Sea	
7. RTC on Conservation and Management of Sea Turtle in Southeast Asia	
8. RTC on Fishery Information and Statistics for Development Planning and Management in the ASEAN Region	
9. RTC on Promotion of FOVOP System to Improve Livelihood of Fisheries Communities in ASEAN	
10. Regional Seminar on Integrated Coastal Resources Management	
11. RTC on International Fisheries-related Issues for 2010	
12. RTC on the Tagging Program for Important Small Pelagic Fishes	
13. RTC on Sustainable Aquaculture Development	
14. RTC on Adaptive Measures to Mitigate the Impact of Climate Changes to Fisheries and Aquaculture	
15. RTC on Sustainable Fisheries Development for Food Security and Poverty Alleviation	
16. RTC on Right-based Fisheries and Co-management for Inland Small-scale Fisheries Management	
17. RTC on Enhancing of Fisheries Resources	
18. RTC on Ecosystem Approach to Fisheries, Responsible Fishing and Practices	
19. 3 rd Meeting of the Regional Advisory Committee (RAC) on Fisheries Management in Southeast Asia	
• Conference publicity activities: organizing press conferences (US\$ 3,000), publicizing through public media (2,000), preparation of VCD (3,000),	10,000

promotional materials (2,000), etc.)	
• Conference kit (for participants that are not supported by ASEAN Foundation (235 person x US\$ 40)	9,400
• Supporting the participation of additional SEAFDEC representatives to the Conference (30 persons from Sec and TD + 10 person from MFRD, AQD and MFRDMD)	20,000
• Hosting of a Reception Dinner for participants (that are not supported by ASEAN Foundation) (235 person x US\$ 75)	17,625
• Supporting the participation of additional officials from Member Countries to the Conference (5 each for 7 non-CLMV Countries = 35 persons x US\$ 1,000)	35,000
* SEAFDEC to seek funding support from other sources	
• Production and Dissemination of Conference Proceedings (235 persons x US\$ 30)	7,050
<i>ASEAN Secretariat</i>	
• Supporting the participation of additional officials from CLMV Countries to the Conference (5 from each country)	25,000
• Consultants supporting the preparation and the conduct of the Conference	48,000
• Delegating representatives to participate in the Conference proper and delivering statement(2 persons x US\$1,000)	2,000
• Participating in the Conference Organizing Committee and other technical preparatory works (3 persons x US\$ 1,000)	3,000
<i>Other collaborating organizations (incl. FAO)</i>	
• Providing experts/resources persons and technical inputs during the preparatory works (20 persons x US\$ 1,000)	20,000
• Delegating representatives to deliver organizational statements during the Plenary Session on “Fisheries Cooperation” (10 person x US\$ 1,000)	10,000
<i>Department of Fisheries, Thailand (as host of the Conference)</i>	
• Supporting the participation of additional DOF officials to the Conference (50 persons x US\$ 250)	12,500
• Hosting of a Reception Dinner for participants (300 persons x US\$ 75)	22,500
• Hosting and arrangements for SOM Meeting (accommodation, meeting package, transportation, SOM Dinners)	14,700
• Hosting and arrangements for Minister’s Meeting (accommodation, meeting package, transportation, lesion officers, Ministers’ Dinners)	48,500
<i>ASEAN-SEAFDEC Member Countries</i>	
• Supporting additional national participants to the Conference (10 countries x 5 persons x US\$ 1,000)	50,000
<i>Private Sectors</i>	
• Organization of the Exhibition/Trade Fair	72,000
• Preparation of exhibition booths to display at the Conference (100 booths x US\$ 500)	50,000
Estimated total contribution from other sources: US\$ 1,109,375	
In-kind contribution	
<i>SEAFDEC, ASEAN, and other organizations</i>	
• Providing technical inputs to the preparatory works and at the Conference proper	

- Preparation of exhibition booths to display at the Exhibition/Trade Fair
- Implementation of follow-up activities to the Conference

DOF Thailand (as host country)

- Provision of officials for registration and secretariat
- Coordination for public relation and press release
- Facilitation on immigration
- Invitation of the ASEAN and SEAFDEC Ministers, Senior Officials, Ambassadors, chairpersons, keynote speakers, press, etc.

ASEAN-SEAFDEC Member Countries (including Thailand)

- Organization of national consultations/meetings to provide technical inputs to the Conference
- Organization of national drawing contests to enhance public awareness on fisheries and food security
- Preparation of exhibition booth to display at the Exhibition/Trade Fair
- Implementation of the follow-up activities to the Conference

Appendix 7

ASEAN-SEAFDEC CONFERENCE WORKPLAN
(as of 28 October 2010)

Date, venue	Non-technical	Technical	Remarks
2009			
7-10 Apr 09, Japan	41 st Meeting of the SEAFDEC Council		SEAFDEC Council in principle supported the Conference
3-5 Jun 09, Vietnam	17 th Meeting of the ASWGF _i		ASWGF _i supported the concept proposal for the Conference
7-17 Jul 09, Lao PDR		Regional Technical Workshop on Community-based Freshwater Aquaculture for Remote Rural Areas of Southeast Asia (SEAFDEC Secretariat)	
27-29 Jul 09, Thailand		Expert Meeting on Fishing Vessel Record and Inventory (SEAFDEC Secretariat)	
13-15 Aug 09, Vietnam	Submission of detailed Conference Proposal to the Special SOM-30 th AMAF Meeting		The Special SOM-30 th AMAF supported the Conference
26-28 Aug 09, Singapore		Regional Technical Consultation on Biotoxins Monitoring in ASEAN (SEAFDEC/MFRD)	
1 Sep 09, Thailand		Preparatory Meeting for the First Technical Sub-Committee Meeting	
2-4 Sep 09, Thailand		2 nd Meeting of the Regional Advisory Committee on Fisheries Management in Southeast Asia (SEAFDEC Secretariat)	
30 Sep 09, Thailand	First Administrative Sub-Committee Meeting		
5-9 Oct 09, Thailand		Regional Technical Workshop on Assessment of Fisheries Status in South and Southeast Asian Regions (SEAFDEC/TD)	
20-21 Oct 09, Malaysia		Regional Technical Consultation on Conservation and Management of Sea Turtle in Southeast Asia (SEAFDEC/MFRDMD)	
20-22 Oct 09, Thailand		Regional Technical Consultation on Regional Cooperation in the Andaman Sea (SEAFDEC/Secretariat)	

7-8 Nov 09, Brunei Darussalam	Prep SOM-31 st AMAF (7-8 November), SOM-9 th MAF+3 (9 November), and 31 st AMAF Meeting (10 November) Meeting		The Meetings supported the conduct of the Conference
15 Nov 09, Malaysia	Second Meeting of the Conference Organizing Committee		Back to back with 32 nd PCM
19 Nov 09, Malaysia	First Advisory Committee Meeting		As one of the agenda of 12 th FCG-ASSP Meeting
11 Dec 09	Sending invitation letter to potential collaborating partners		Received confirmation from some organizations
11 Dec 09	Submission of Proposal to ASEAN Foundation: for funding support for 5 participants from each A-S Member Countries, SEAFDEC Secretariat and Departments		Waiting for confirmation
Dec 09	Submission of Proposal to Japan ASEAN Integration Fund (JAIF): for funding support 5 participants from each CLMV Countries		Waiting for confirmation
Dec 09	Submission of Proposal to Japan ASEAN Integration Fund (JAIF): for funding support for Conference Consultants		Waiting for confirmation
2010			
18-22 Jan 10, Thailand		Regional Training/Workshop on Identification of Deep-Sea Fish (SEAFDEC/TD)	
19-21 Jan 10, Thailand		Regional Technical Consultation on Fishery Information and Statistic (SEAFDEC Secretariat)	
21 Jan 10, Thailand	Press Conference, release of the Conference First Announcement and launching of the Conference website		
26-27 Jan 10, Thailand		Regional Seminar on Integrated Coastal Resources Management (SEAFDEC/TD)	
2-4 Feb 10, Thailand		Regional Technical Consultation on International Fisheries Related Issues for 2010 (Secretariat)	
5 Feb 10, Thailand		First Technical Sub-Committee Meeting	
17-19 Mar 10, Thailand		Regional Technical Consultation on Sustainable Aquaculture Development (SEAFDEC/AQD)	

22-26 Mar 10, Thailand		Regional Technical Consultation on Promotion of FOVOP System in ASEAN (SEAFDEC Secretariat)	
8-9 Mar 10, Malaysia		Core Expert Meeting on Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea (SEAFDEC/MFRDMD)	
5-9 Apr 10, Lao PDR	42 nd SEAFDEC Council Meeting		The Council took note on the prepress and provided directives
25 May 10, Thailand	Administrative Core Group Meeting		
23-25 Jun 10, Brunei Darussalam	18 th Meeting of the ASWGF		The Meeting took note on the prepress and provided guidance
End of Jun 10	Finalization of Conference Program (inauguration, technical session, ministerial session, exhibition), venue and registration policy, etc.		
20-22 Jul 2010, Singapore		Regional Technical Consultation on Issues related to Post-harvest and Safety of Fish and Fishery Products (SEAFDEC/MFRD)	
2-5 Aug 10, Brunei Darussalam	Special SOM-31 st AMAF (2-4 August) and Special SOM-9 th AMAF+3 (5 August)		To report the progress
16 Aug 10	Second Press Conference for the ASEAN-SEAFDEC Conference, and release of the Conference Second Announcement		
17-19 Aug 10, Thailand		Regional Technical Consultation on Fisheries Human Resources Development (HRD) for Poverty Alleviation (SEAFDEC Secretariat)	
31 Aug – 2 Sep, Thailand		Expert Meeting on Deep-sea Fishing and Its Impact to Marine Environment (SEAFDEC/TD)	
15-17 Sep 10 Bangkok, Thailand		Regional Technical Consultation on Managing Fishing Capacity to Combat IUU Fishing (SEAFDEC Secretariat/ Sida)	
11 Oct 10, Thailand		SEAFDEC Department Chiefs' Meeting	
12-14 Oct 2010 (tentative), Singapore		Regional Technical Consultation on Traceability Systems for Aquaculture Products in the Region (SEAFDEC/MFRD)	

12-15 Oct 10, Thailand		1 st Regional Technical Consultation on Sustainable Fisheries Management – Themes 1, 3, 8 (SEAFDEC/TD, MFRDMD and Secretariat)	
October 10		Circulation of the outline for drafting the 2011 Resolution and Plan of Action to ASEAN-SEAFDEC Member Countries	
20-26 October 2010, Cambodia	Prep SOM-32 nd AMAF, Prep SOM-10 th AMAF+3, and 32 nd AMAF Meeting		To report the progress
1-4 Nov 10, Thailand		2 nd Regional Technical Consultation on Adaptation to a Changing of Environment – Themes 5,6, 7 (SEAFDEC Secretariat)	
1 Nov 10- 31 Mar 11	Pre-registration period (early payment rate USD 250)		
9 Nov 10, Bali, Indonesia		1 st Sub-Regional Public Private Sector Dialogue on Sustainable Fisheries for Food Security	
11-12 Nov 10, Bangkok, Thailand		2 nd Sub-Regional Public Private Sector Dialogue on Sustainable Fisheries for Food Security	
Nov 10 (tentative), Thailand		Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach (SEAFDEC/TD)	
29 Nov 10, Thailand	Second Meeting of the Conference Organizing Committee		
30 Nov-2 Dec 10, Thailand		33 rd Program Committee Meeting (PCM)	
3-4 Dec 10, Thailand		13 th Meeting of FCG/ASSP	one of the agenda as Second Advisory Committee Meeting
Dec 10		Finalize all Technical Panel arrangements; list of all resources persons, panelist, time-table	
2011			
10-12 Jan 11		3 rd Meeting of the Regional Advisory Committee on Fisheries Management (RAC) in Southeast Asia (SEAFDEC Secretariat)	
Jan 11		Compilation of outcomes from SEAFDEC Technical Consultations and National Seminars and preparation of the Draft Technical Document	

Jan/Feb 11	ASEAN Regional Meeting for Drafting the Resolution and Plan of Action (ASEAN Member States' designated drafter)		
Mar 11 (tentative), Thailand	Third Administrative Sub-Committee Meeting		
Mar-Apr 11		Finalization and mass production of the Technical Documents, and information materials for the Conference	
Mar-Apr 11	Final Administrative Preparatory Works – preparation of Conference Kit, registration procedures and required logistic arrangements		
		Report to the 43 rd Meeting of the SEAFDEC Council	
18 Apr 11	Special ASWGFi for drafting the Resolution and Plan of Action		
21-22 Apr 11	19 th ASWGFi		
1Apr-31May 11	Pre-Registration Period (normal rate USD 300)		
Apr 11 (tentative), Malaysia	43 rd Council Meeting		
Apr (tentative), Thailand	Third Press Conference for the ASEAN-SEAFDEC Conference, and release of the Conference Third Announcement		
30 Apr 11	Deadline for submission of best drawings from Drawing Contests		
13-17 Jun 11, Thailand	ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020		
June (tentative), Cambodia	19 th Meeting of the ASWGFi		

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature)
Lead Department:	Training Department
Lead Country:	Thailand
Total Duration:	2008-2012
Proposed Budget:	10,000 USD

1. INTRODUCTION

SEAFDEC Training Department has implemented the project on responsible fishing technologies and practices in collaboration with Southeast Asian countries based upon the project formulation prescribed by the Resolution and Plan of Action endorsed at the Millennium Conference in 2001 and also the regional program planning meeting in 2005 for the Special 5-year Program on Sustainable Fisheries for Food Security in the ASEAN Region (2006-2010).

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

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

The interaction between threatened species of international concerned and fisheries has also been studied and investigated. Its focus is particularly given to promote the efficient use of sea turtle excluder devices (TEDs) to reduce incidental catch of the sea turtles. In addition, information and data collection on the sea turtles mortality has been carried out throughout the region in close collaboration with SEAFDEC Member Countries together with the assistance of the Member Countries of IOSEA/MOU. SEAFDEC has made the great effort and contribution to many international meetings and conferences through the presentation of its major achievements during the course of promotion on the use of TEDs and circle hooks in longline fishing.

Another work includes information compilation on fishing gear and methods in Southeast Asia. The survey was conducted in most of the Member Countries. It is recognized that fishing gear monographs produced by this sub-activity has been extensively used as the reference for their national handbooks of fishing gears and technologists.

2. PROGRAM

2.1 Objectives

The objectives of this project are to:

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

2.2 Program Description

In line with FAO Code of Conduct for Responsible Fisheries, SEAFDEC has continued to promote the selective and environmental safety fishing gears and practices that should be further developed and applied in order to maintain biodiversity and to secure fish for the people as well as to conserve living aquatic ecosystem.

For the year 2011, the program of activity under this project will be implemented based upon the current situation of promotion on the use of selective fishing gears and devices for reduction of unwanted catch, by-catch, incidental catch, etc. The emphasis of the project activities is also given to the efforts in reducing the impact of fishing on coastal and marine resources through the promotion on the use of alternative energy for fishing operations (such as wind energy, etc.), reduction on the energy use in fishing operations (utilization of lights in squid/anchovy fishing operation, etc.), support the Member Countries in conducting actual demonstration and research on the use of such selective fishing gear/devices as well as the study on appropriate fishing technology for conserving environment.

Since the Year 2008, the implementation of the project has been supported by the Japanese Trust Fund in conjunction with GEF/UNEP/FAO Project on “Sustainable Tropical Shrimp Trawl” and other relevant activities implementing by Tokyo University of Marine Science and Technology (TUMSAT). Collaboration arrangement with FAO, TUMSAT, national responsible agencies, and other relevant organizations/institutes will also be made through the implementation of this project. It includes staff exchange, dispatch of experts and participation in the relevant meeting/workshops.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
1. Technical assistance on selective fishing gears and devices to reduce discards and by-catch of juvenile and trash fish in the region	1-2 Sep	Research and development on fishing gear selectivity and excluder devices, in cooperation with Department of Fisheries – Thailand, was drafted.
2. Technical assistance for assessment of the impacts from various kind of fishing gears and practices on fisheries resources, environment, and ecosystem	18-22 Oct	Follow-up with the implementation on by-catch reduction device and measures in the Philippines in collaboration with BFAR.
3. Interaction between threatened species of international concerned and fisheries	4-7 May	Organization of the regional workshop on discards and by-catch management in collaboration with FAO/GEF, FAO/RAP, and other regional organizations. The outcomes from the workshop are logframe of activities that are developed based upon the national and regional priority topics. As far as SEAFDEC is concerned, SEAFDEC has proposed important regional activities that will be added or composed into the regional plan of

		activities for further implementation in the Southeast Asian countries.
4. Production of promotional materials and technical papers	Jan – Dec	Dissemination of the promotional media and materials through workshop/meeting organized by SEAFDEC and other relevant agencies.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

(1) Theme: Responsible fishing technologies
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Insufficient knowledge on selective fishing gear and devices to reduce by-catch, trash fish, and juvenile of commercial important species • Poor enforcement of illegal fishing, and the failure in managing fishing capacity • Poor coordination and collaboration between national agencies responsible for fisheries management and conservation of endanger/threatened aquatic animals.

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • Adaption on the use of JTEDs in the Member Countries • Development of human resources in the field of selective fishing gears and devices in the Member Countries • Establishment of in-country coordination between national agencies responsible for fisheries management and conservation of endangered/threatened aquatic animals. • Establishment of a network for reduction of the impact of fishing gears and their practices to coastal and marine ecosystem

3.2.3 “Steps” toward achieving final goals:

Step 1: Enhance knowledge of fishers and fishery officials on selective fishing gears and devices through the study and actual trial and demonstration on the use of selective fishing gears and devices, including TEDs and JTEDs, in the Member Countries with the technical assistance from SEAFDEC as well as FAO and other relevant agencies.
Step 2: Organization of regional technical meeting to update and gather information on the use of selective fishing gears and devices in the Member Countries, and to explore ways readjust such gears and devices that will be applicable for the actual usage.
Step 3: Develop appropriate selective fishing gears, devices, and their good practice to minimize the impacts from fishing on coastal and marine environment.

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1, 2, and 3
(2) Project duration: 2008-2010
(3) Main activities: <ul style="list-style-type: none"> • Develop and improve selective and responsible fishing gears for sustainable fisheries development and management in the Southeast Asian region; • Carry out research for reduction of the impacts from fishing on coastal and marine ecosystem; and • Disseminate and update information on responsible fishing gears and technologies currently using in the Member Countries.

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program <ul style="list-style-type: none"> • Provide technical support to fishing gear technologists on the use of selective fishing gears and devices to reduce the by-catch and mortality of endangered species, etc. in fishing. • Organization of the regional technical meeting
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<ul style="list-style-type: none"> • Conduct an actual sea trials and demonstration on the use of TEDs and JTEDs. • Disseminate information based on the major outputs from the project implementation. 	
(2) Main achievements till the end of 2010	
<ul style="list-style-type: none"> • Organization of the regional workshop on discards and by-catch management in collaboration with FAO/GEF and other relevant agencies (international, regional, and national) • Draft plan of the R&D on fishing gear selectivity and devices in collaboration with Department of Fisheries Thailand • Dissemination information based on the outcomes from each project activity implementation 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010	
Expected outcome	Achievement rate (%)
1. Technical assistance on selective fishing gears and devices to reduce discards and by-catch of juvenile and trash fish in Southeast Asia	90%
2. Technical assistance for assessment of the impacts from various fishing gears and practices on fisheries resources, environment, and ecosystem.	100%
3. Study on the interaction between threatened species of international concerned and fisheries	100%
4. Production of promotional materials and technical papers	100%

3.2.6 Evaluation of Program activities in 2010

SEAFDEC-FAO/GEF regional workshop on strategies for fisheries by-catch management was successfully held at the Training Department from 4 to 7 May 2010. The Workshop framed Phase II of REBYC-II Project preparation process after the project inception held in November 2009. Development of log frame and plans for the project activities was also developed. It also includes annual plan of activities for technical support from SEAFDEC. A plan for further promotion on the use of JTEDs in the Philippines was also discussed and developed at the Workshop for further implementation. Lessons learned and experience of the adoption on the use of JTEDs in the Philippines is planned to be documented for further sharing with other Member Countries. Furthermore, problems and constraints in using such excluder devices are planned to be discussed and concluded in the document for further appropriate follow-up actions.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

Activity 1. Technical assistance of selective fishing gears and devices for reduce discards and by catch of juvenile and trash in the region

SEAFDEC continues to promote the implementation of the selective fishing devices in the region in close collaboration with its Member Countries. It includes Juveniles and Trash Excluder Devices (JTEDs) for reduction of discard and by-catch in trawl fisheries and other selective devices and technology. In addition, SEAFDEC will coordinate with GEF/UNEP/FAO by-catch project phase II (to be implemented from 2011 to 2014) for assist Member Countries in terms of technical inputs and assistance. It is proposed that SEAFDEC will also expand the study of the development to other fishing gear such as traps and other fishing gear/practices.

Activity 2. Technical assistance of the assessment of the impacts of various kinds of fishing gear and practices on fisheries resources, seabeds, environment and ecosystem

Nowadays, light fishery for squids and anchovies capture is developed and its catch efficiency has been improved. In 2011, SEAFDEC will conduct further research based on the technical review made during the previous years on squid and anchovy fishing by starting up with some experiments and at-sea trial. It is envisaged that the activity can obtain some preliminary results that criteria for the use of light intensity and color will be further discussed among the gear technologist for further follow up actions.

Activity 3. Interaction between threatened species of international concern and fisheries

This refers to incidental catch of threatened species such as sea turtles, dolphins and other species which have the potential to be included in the list of CITES, Appendix 1 and 2 in fishing operations. There is still insufficient information, in particular on the current status of sea turtles and factors affecting the mortality of sea turtles. Therefore, activities on collection of information of sea turtle mortality should be continually conducted in close cooperation with Member Countries and other relevant agencies namely IOSEA-Turtle MOU, Department of Coastal and Marine Resources, etc.

Activity 4. Production of promotion materials and technical papers

The dissemination of information collected by the project activities will be conducted through SEAFDEC's participation in regional and international meetings/workshops. TD will also work in cooperation and support of FAO on Global Fishing Gear Classification Catalogue. The promotion materials and technical papers will be produced and disseminated. They will also be disseminated through relevant meetings/workshops, training courses and exhibitions.

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1. Technical assistance on selective fishing gears and devices to reduce discards and by-catch of juvenile and trash fish in the region	Jan – Dec	Continuation of the coordination works at the regional level with GEF/UNEP/FAO by-catch project phase II considering the most benefit to the Member Countries in transferring knowledge on selective fishing gears and devices as well as improvement of fisheries management to the Member Countries. Sea-trial on the use of TEDs and JTEDs will also be demonstrated in collaboration with the Member Countries.
2. Technical assistance for assessment of the impacts from various fishing gears and practices on fisheries resources, environment, and ecosystem.	Mar – Jun	Follow-up works on the use of light for fishing in the Southeast Asian region. Summary result from the project implementation in 2010 will be drafted further appropriate formulation of research plan and experiment. It is planned that system setup for research on the use of light in squid fishing will be conducted.
3. Interaction between threatened species of international concerned and fisheries	Jan – Dec	Information on status of sea turtle incidental catch will be continually collected through the communication with relevant agencies and participation of the project staff to relevant meetings.
4. Production of promotional materials and technical papers	Jan – Dec	Information collected/produced by the project implementation will be disseminated. Drafted FAO on Global Fishing Gear Classification Catalogue will also be shared to the Member Countries and other relevant organizations.

4.2 Expected Outcomes in the Year 2011

The use of JTEDs and other selective fishing gear and devices will be continually promoted and demonstrated in close collaboration with the Member Countries. Lessons learned from implementation of the project will be summarized for further improvement of project planning and implementation process. Information on international concerns with regard to the use of selective fishing gears and devices will be updated and shared with the Member Countries through communication and website of the Training Department. System for research on the use of light fishing will be completely setup.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses
Lead Department:	Training Department
Lead Country:	Thailand
Total Duration:	2008-2012
Proposed Budget:	25,000 USD

1. INTRODUCTION

Concerning that many of onboard fish handling and preservation techniques in small-scale and commercial-scale fishing boats of the Southeast Asian region are still in the developing stage. Nevertheless, the demands of fish and living aquatic animal have gradually increased particular for the human fish food. It is therefore, the program of activities under this project aims to improve quality of catch onboard fishing boats through transfer of knowledge and technology on reduction of the post-harvest losses. Beneficiaries of this project are mainly small- and medium-scale fishing operators and fishery officials involved in post-harvest technology. Activities under this project include onsite training program and capacity building for fishers of squid fishing boats, purse seiners, longliners, etc.

There is potential to develop new fisheries and expand currently under-exploited fisheries resources including aquatic animals living on un-trawlable ground in the Southeast Asian waters. However there is insufficient knowledge for supporting their full extent and status. Reasons for these stocks not being exploited to maximum potential are wide and varied. It is recognized that it is difficult in harvesting and processing the resource without suitable harvesting methodologies and lack of market demand.¹³ To supplement the achievement of the utilization of these resources, onboard and onshore post-harvest technologies are also required. It is therefore, a set of the programs and activities under this project include R&D for the sampling gears to be used in un-trawlable fishery resources and post-harvest technologies.

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

2. PROGRAM

2.1 Objectives

The objectives of this project are to:

- 1) Conduct and support the actual survey for better understanding on the potential fisheries resources in the un-trawlable grounds in the Southeast Asian waters through collaborative research program using M.V. SEAFDEC 2 and other research vessels;
- 2) Carry out research and development program on appropriate fishing gears and practices for sustainable development and management of the fisheries resources focusing on the un-trawlable grounds of the Southeast Asian waters;

¹³ Technical Document: ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium, 19-24 November 2001, Bangkok, Thailand.

- 3) Carry out research and development on environmental and users friendly post-harvest technology for reduction of the post-harvest losses and improving quality of catch through a better onboard fish handling techniques;
- 4) Transfer appropriate technologies for reduction of the post-harvest losses; and
- 5) Disseminate information on the potential resources on un-trawlable grounds and onboard post-harvested techniques.

2.2 Program Description

Understanding the potential under-utilized fisheries resources and promotion of the resource exploration in a precautionary manner in the Member Countries through the collaborative program among SEAFDEC and Member Countries will be focused and developed, in particular on the utilization of M.V. SEAFDEC 2 under the cost sharing policy. The preliminary results from the collaborative survey include new findings on the potential fishery resources will be reported and shared with other Member Countries as appropriate. R&D on improvement of catch quality and onsite training program on environmental friendly post-harvest technology onboard fishing vessels will be continually implemented in close collaboration with the Member Countries.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
1. Data collection on fisheries resources	May	1) Conducted the consultation visit to Brunei for finalizing the plan for actual research survey in the EEZ of Brunei using M.V. SEAFDEC 2, visited during 25-28 May 2010.
	Jun-July	2) Supported TD technical staff onboard M.V. SEAFDEC 2, cruise no. 35-4/2010 to conduct actual survey on fisheries resources in Malaysian water, 28 Jun to 30 July
	May	3) Technical input to support the training program of NATC (Malaysia) for improvement of tuna longline fishing (21-30 May 2010) and appropriate onboard post-harvest technology transfer.
	July	4) Technical staff participated to RTC on the Issues related to post-harvest and safety of fish and fisheries products in Southeast Asia (organized by SEAFDEC/MFRD, 20-22 July 2010).
2. R&D on appropriate sampling gears and environmental users friendly fish handling techniques	Nov to Dec (ongoing)	Preparation of the publication on review of "fish freshness detection tool-kit".
3. Human resource development	Aug-Oct	1) Organization of on-the-job training on survey method for fisheries resources in un-trawlable ground of Malaysian and Brunei waters onboard MV SEAFDEC2
	Nov and Dec (ongoing)	2) Organized two (2) onsite training programs on environmental friendly fish handling and preservation techniques in Thailand (tentatively November 2010), and Vietnam (tentatively 13-17 December 2010)

4. Information dissemination	Aug	1) Published report of the onsite training on environmental/users friendly fish handling and preservation techniques, organized at Phu Yen, Vietnam, 4-6 August 2009
	Nov-Dec	2) Disseminated information produced by the project based on activities implemented throughout the year 2010, in format of publications, media, etc.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

(1) Theme: Sustainable utilization of fisheries resources
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Over-exploitation of fisheries resources in the coastal areas • Still potential of fisheries resources in un-trawlable grounds in the Southeast Asian region • Low quality of catch and low market value due to the poor post-harvest techniques and facilitates on boat and landing site

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • Dissemination of information on potential fishery resources in the un-trawlable grounds for future formulation of its sustainable development and management plan. • Reduction of quality/value losses through promotion on the use of the appropriate onboard fish handling technology/methodology.

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Information collection and R&D on potential fishery resource in un-trawlable grounds</p> <ul style="list-style-type: none"> • Information collection on the potential fishery resources in the un-trawlable grounds through organization of workshop/meeting and actual survey by using M.V. SEAFDEC 2 • R&D on appropriate fishing gears and techniques for utilization of fishery resources in the un-trawlable grounds • R&D on appropriate onboard fish handling techniques/systems
<p>Step 2: Estimate potential fishery resources in un-trawlable grounds, and improve national capacities for reduction of post-harvested losses</p> <ul style="list-style-type: none"> • Estimate the potential fishery resources in un-trawlable grounds through the actual resource surveys using M.V. SEAFDEC 2 and/or national research vessels • Continuation of R&D on appropriate fishing gears and techniques for utilization of resources in the un-trawlable grounds • Support national capacities through various HRD programs/activities focusing on: <ul style="list-style-type: none"> ▪ development/use of appropriate fishing gears and techniques for utilization of the resources in the un-trawlable grounds ▪ onboard fish handling techniques/systems
<p>Step 3: Information exchange and dissemination</p> <ul style="list-style-type: none"> • Organization on the workshop/onsite training on the potential fishery resources in the Southeast Asian region • Formulation of the set of recommendations for sustainable utilization of resources in un-trawlable grounds in the Southeast Asian region • Information dissemination of the outputs from the project implementation

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1, 2, and 3
(2) Project duration: 2008-2012
(3) Main activities: <ul style="list-style-type: none"> • Supporting actual surveys, information/data collection, and data analysis • R&D on appropriate fishing gears and techniques for un-trawlable grounds and onboard fish handling techniques • HRD on the appropriate fishing gear and techniques for un-trawlable grounds • HRD on the appropriate onboard fish handling techniques

3.2.5 Progress and achievements of the current program:

(4) Main activities conducted in the current program <ul style="list-style-type: none"> • Supporting of actual surveys, information/data collection, and data analysis • R&D on appropriate fishing gear and technique for un-trawlable area and onboard fish handling technique • HRD on the appropriate fishing gears and techniques for un-trawlable area • HRD on the appropriate onboard fish handling techniques 	
(5) Main achievements till the end of 2010 <ul style="list-style-type: none"> • Supporting actual surveys, information/data collection, and data analysis <ul style="list-style-type: none"> ▪ Consultation visit to the country requested to use M.V. SEAFDEC for the national fisheries resources survey in their EEZ. ▪ Data collection through actual survey: supporting staff of SEAFDEC/TD to join the fishery resources survey by using M.V. SEAFDEC 2 and other national research vessels (<i>i.e.</i> M/V DA-BFAR, and R.V. Chulabhorn) • R&D on appropriate fishing gears and techniques for un-trawlable grounds and onboard fish handling techniques <ul style="list-style-type: none"> ▪ R&D and promotion on the use of environmental/users friendly fish handling techniques in collaboration with Member Countries ▪ Ongoing process in preparation for: i) development of the appropriate fish handling techniques; ii) study/review on the fish freshness detection tool; and iii) fish handling on research vessel • HRD on the appropriate fishing gears and techniques for un-trawlable grounds <ul style="list-style-type: none"> ▪ Knowledge transfer on the design of fishing gear and its operation during the cruise survey in the Member Countries • HRD on the appropriate onboard fish handling techniques <ul style="list-style-type: none"> ▪ Organization of a series of onsite training on environmental/user friendly fish handling and preservation techniques in Member Countries 	
(6) Outcomes during the program period and expected achievement rate till the end of 2010	
Expected outcome	Achievement rate (%)
Supporting of actual survey, information and data collection, and data analysis	100%
R&D on appropriate fishing gear and techniques for un-trawlable grounds and onboard fish handling techniques	70%
HRD on the appropriate fishing gears and techniques for un-trawlable grounds	100%
HRD on the appropriate onboard fish handling techniques	100%

3.2.6 Evaluation of Program activities in 2010

The technical supports to the Member Countries requested for the actual resources survey, in the EEZ of Brunei Darussalam and Malaysia by using MV SEAFDEC2, have been completely implemented. However, due to the fact that sea condition during such actual survey could not be expected. It is therefore recommended that the period of the actual survey should be more flexible enough in order to recover the period that may be lost due to the bad sea condition. During the Year 2010, the result from the study on development of the fish freshness detection tool-kit could not be published and needs to be done during the 1st quarter of the year 2011. HRD activities on appropriate sampling gears and onboard fish handling techniques have been completely implemented during the year 2010.

3. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

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

Activity 1: Data Collection on Fishery Resources

The joint research survey on potential under-utilized resources in un-trawlable grounds in the EEZ of the Member Countries will be continually conducted in close collaboration with the national research programs by using M.V. SEAFDEC2 and/or by other research vessels. The result of the survey will be analyzed at the national/regional levels. It is the matter of fact that expenditure to carry out marine resources survey is costly, therefore, secondary data and information will be collected through various sources of information, including information collection through participation of the project technical staff to relevant meetings/workshops, and/or by the literature review.

Plan of the activity under this category includes consultation visit, and fishery resources survey and data collection through actual survey and/or from the meeting/workshop to be organized by SEAFDEC or by other relevant initiatives.

Activity 2: R&D on Appropriate Sampling Gears, and Environmental/Users Friendly Fish Handling Techniques

To explore the under-utilized resources in the un-trawlable grounds, R&D on suitable fishing/sampling gears (*i.e.* deep-sea traps, hook-and-line, etc.), fishing operation techniques, and instrument and machineries will be continued to carry out by using M.V. SEAFDEC 2 and/or by other research vessels. In addition, environmental/users friendly fish handling and preservation techniques, in particular for the high value species from un-trawlable grounds. Sea trial for testing and promoting the developed fishing gear/instrument and fish handling system, in the Member Countries to transfer appropriate technology, will also be continued. Regarding the sub-activity on the development of fish freshness tool kit, it is planned that the preliminary result from the review on fish freshness will be drafted and later discussed with technologists in order to come up with recommendations for the next step to be taken as the follow-up activity.

Activity 3: Human Resource Development

The regional HRD program on: i) sampling/fishing gears, techniques, and machineries; and ii) environmental/users friendly fish handling and preservation techniques; will be carried out through the joint program with the Member Countries. Activities under this category include: on-the-job training for research methods for the fisheries resources survey in the un-trawlable grounds; and onsite training on the environmental/users friendly fish handling and preservation techniques.

Activity 4: Information Dissemination

Information dissemination will be made through various sources, including SEAFDEC website, brochures, publications, reports of activities, information package, etc.

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1.Data collection on fisheries resources	Mar – June	1) Consultation visit (s) to the country who requested to use M.V. SEAFDEC 2 for their national resource survey in un-trawlable grounds;

	Mar – July	2) Support TD staff to provide technical input during the actual survey on fishery resources in the un-trawlable grounds of the Member Countries; and
	Jan – Dec	3) Support technical inputs to relevant meetings/events.
2.R&D on appropriate sampling gears, and environmental/user friendly fish handling techniques	Jan – Dec	1) Continuation of development/improvement of catch efficiency of the fishing/sampling gears for resources survey in un-trawlable grounds of the region; and
	June	2) Summarize the preliminary result of review on the development of fish freshness tool-kit.
3.Human resource development	Mar – July	1) Provide technical support to the Member Countries focusing on-the-job training for researchers on survey methods of fisheries resources in un-trawlable grounds, based on the request from the countries on the use of M.V. SEAFDEC 2;
	June – Dec	2) Assist in national capacity building program related to fish handling and post-harvested technologies by co-organizing the on-site training in close collaboration with the Member Countries; and
	Aug	3) Transfer appropriate technology on fish handling techniques to the less-developed Member Countries through organization of the on-site training program on environmental friendly fish handling and preservation techniques (2 countries).
4.Information dissemination	Jan – Dec	Produce project outputs from activities implementation, and disseminate/sharing this output/information with others.

4.2 Expected Outcomes in the Year 2011

1. Support the national fisheries resources survey in the EEZ of Member Countries based upon their request.
2. Improvement/development of appropriate sampling gear for the resource survey in un-trawlable grounds.
3. Organization of on-the-job training program during the actual survey conducted in EEZ of the Member Countries on sampling gears and their practices.
4. Transfer of technology on the post-harvested technologies and reduction of the post-harvested losses in the less-developed countries (e.g. Cambodia, Lao, Myanmar, and Vietnam), through on-site training program.
5. Information dissemination on the sampling gears, post-harvested technology in particular on the reduction of the post-harvest losses for the catch, to the Member Countries and other relevant organizations.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Fisheries Resources Survey and Operational Plan for M.V. SEAFDEC 2
Lead Department:	Training Department
Lead Country:	All Member Countries
Total Duration:	2011

1. INTRODUCTION

Since 2004, SEAFDEC Training Department has worked in close collaboration with the Member Countries and other key partners at both national and regional levels on utilization for the use of M.V. SEAFDEC2. The M.V. SEAFDEC2 has supported the Member Countries in assessing and utilizing their fishery resources. In a broader sense, the acquisition of M.V. SEAFDEC 2 will help strengthen technical cooperation and effective fisheries and environmental management in the ASEAN region through the enhancement of research and training capability.

Over the years, more than 30 cruises have been carried out by M.V. SEAFDEC 2. Regarding operational coast of using M.V. SEAFDEC 2 until the Year 2009, national research surveys was based on a cost-sharing policy using the budget from SEAFDEC's Minimum Regular Contribution and the Member Countries, as adopted at the 37th Meeting of the Council of SEAFDEC in 2005.

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

2. PROGRAM

2.1 Objectives

The objectives of this project are to:

- 1) Assist Member Countries in conducting research survey on fisheries resources (*i.e.* fishing trail and demonstration, ecosystem and hydro-acoustic surveys), oceanographic surveys, fish preservation, fish sampling and its species identification;
- 2) Assist Member Countries in building human capacity through activities during the surveys onboard M.V. SEAFDEC 2 based upon the requirement of the requesting country; and
- 3) Facilitate the process for a new fishing ground establishment in the region (*e.g.* deep-sea fisheries, un-trawlable grounds, etc.).

2.2 Program Description

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

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
1. National fisheries resources survey in EEZ water of Malaysia	June – Aug	The national research survey was conducted in Sabah and Sarawak area as requested by Department of Fisheries Malaysia in collaboration with Fisheries Research Institute of Sarawak, SEAFDEC/MFRDMD, Office of State Fisheries Sabah. Sampling gears used in the survey including beam trawl, bottom vertical longline, deep-sea trap, squid jigging, and pelagic longline. Biological and physical oceanographic data were also collected during the cruise, 28 June-11 August 2010.
2. National fisheries resources survey in EEZ water of Brunei Darussalam	Sep – Oct	The deep-sea fisheries resources survey was carried out in the water of Brunei Darussalam. Main activities of the survey included: oceanographic survey using ICTD, IKMT, bongo and neuston nets, temperature-depth sensor, current indicator, and other water information; demersal resources survey using bottom beam trawl, otter-board trawl and deep-sea trap; acoustic survey using FQ-80; and actual cetacean sighting activity, 15 September-14 October 2010.
3. Training workshop on the Research Methodology for the study of impact of fishing on deep-sea ecosystem	Oct	The workshop was jointly organized by SEAFDEC Training Department and Department of Fisheries Brunei Darussalam. The objective of the workshop was to enhance human resources capacity for improvement of knowledge on research methodologies to study the impact of fishing on the deep-sea ecosystem. The workshop was attended by participants from the Member Countries including taxonomists, field biologists, and others involved in deep-sea fishery research, 16-20 October 2010.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

(1) Theme: Fisheries resources survey
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • There are potential under-utilized fisheries resources in the Southeast Asian waters, including un-trawlable grounds, and deep-sea areas where there is still insufficient information/data. • Human resource capacity in the field of fisheries resources exploration is significantly needed in the Member Countries. • Limited capacity of the Member Countries in terms of research vessels for fisheries resources survey.

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • Exploration of fisheries resources in the un-trawlable grounds in the area of EEZ of the Member Countries • Establishment of new fishing resources area for the Member Countries

- Building various human resources capacities for fisheries officials of the Member Countries in the field of marine resources survey

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Consultation visit to the Member Countries who requested the utilization of M.V. SEAFDEC 2</p> <ul style="list-style-type: none"> • SEAFDEC/TD initiates discussion with the country by preparing draft plan of activities onboard M.V. SEAFDEC 2 for the cruise survey • SEAFDEC/TD staff concerned visit the requesting country to use MV SEAFDEC 2 for finalization of the cruise plan • Summary report of the meeting for the cruise plan is drafted
<p>Step 2: Collaborative arrangement of SEAFDEC/TD and the country to implement the cruise survey</p> <ul style="list-style-type: none"> • SEAFDEC/TD and the country proceed with the arrangement as agreed for the cruise survey • M.V. SEAFDEC 2 carries out the cruise survey based upon the survey planned
<p>Step 3: Result reporting</p> <ul style="list-style-type: none"> • Results from the fisheries resources survey will be reported and published within the proper period of time by the country with the assistance of SEAFDEC

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1-3
(2) Project duration: since 2004 to date
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • Supporting actual fisheries resources survey by conducting: fishing gear survey, oceanographic survey, hydro-acoustic survey, and other activities. • Carry out on-the-job training program based upon the request and plan of activity with the requesting country

3.2.5 Progress and achievements of the current program:

<p>(4) Main activities conducted in the current program</p> <ul style="list-style-type: none"> • Supporting actual fisheries resources survey by conducting: fishing gear survey, oceanographic survey, hydro-acoustic survey, and other activities. • Carry out on-the-job training program based upon the request and plan of activity with the country 								
<p>(5) Main achievements till the end of 2010</p> <ul style="list-style-type: none"> • National fisheries resources survey in the Member Countries 								
<p>(6) Outcomes during the program period and expected achievement rate till the end of 2010</p> <table border="1"> <thead> <tr> <th>Expected outcome</th> <th>Achievement rate (%)</th> </tr> </thead> <tbody> <tr> <td>National fisheries resources survey in EEZ of Malaysia</td> <td>100%</td> </tr> <tr> <td>National fisheries resources survey in EEZ of Brunei Darussalam</td> <td>100%</td> </tr> <tr> <td>Training workshop on the research methodology for the study of impact of fishing on deep-sea ecosystem</td> <td>100%</td> </tr> </tbody> </table>	Expected outcome	Achievement rate (%)	National fisheries resources survey in EEZ of Malaysia	100%	National fisheries resources survey in EEZ of Brunei Darussalam	100%	Training workshop on the research methodology for the study of impact of fishing on deep-sea ecosystem	100%
Expected outcome	Achievement rate (%)							
National fisheries resources survey in EEZ of Malaysia	100%							
National fisheries resources survey in EEZ of Brunei Darussalam	100%							
Training workshop on the research methodology for the study of impact of fishing on deep-sea ecosystem	100%							

3.2.6 Evaluation of Program activities in 2010

The national fisheries resources surveys in Malaysia and Brunei Darussalam were successfully implemented as requested/planned. Based on the unexpected weather sea condition during the survey, it resulted that some activities could not be conducted. It is therefore recommended that the total period of the survey should cover the period longer than actual activity plan. This could help in more successfully implementation of the activity as planned and requested by the country.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
National fisheries resources survey in EEZ water of Malaysia	Sep	The resources survey is planned to carry out in Sarawak, Sabah and Labuan coastal waters, east Sabah coastal waters. Main activities of the survey include; bottom trawling at depth range 200 to 500 meters; deep-sea traps and vertical longlines in un-trawlable grounds at depth > 200 meters.

4.2 Expected Outcomes in the Year 2011

1. National fisheries resources survey in the EEZ of Member Countries including un-trawlable grounds and deep-sea areas will be conducted.
2. Human resource capacity of the Member Countries will be built during the national fisheries resources survey in the field of fishing/sampling gears, oceanographic survey equipments, hydro-acoustic survey using FQ-80 system.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Information Collection on Highly Migratory Species in Southeast Asian Waters
Lead Department:	Training Department
Lead Country:	Philippines
Total Duration:	2008-2012
Proposed Budget:	24,000 USD

1. INTRODUCTION

The project initiated information collection of highly migratory species in Southeast Asian Waters since 2008 with specific objectives to review and evaluate status of tuna fisheries/productions in the Southeast Asian waters as well as to develop the regional tuna database based on information collection from selected tuna landing sites and national tuna statistic. Development of tuna data logbook or documentation system to support the proper data and information collection will be a part of activity. Through the establishment of a working group for information collection on tuna fisheries, there are currently 4 participating countries, namely Indonesia, Philippines, Thailand and Vietnam (IPTV-Countries).

In 2008, at the 1st Working Group Meeting, the existing information of tuna productions at national level and ways to improve tuna data collection were discussed. It was found that level of national development of the participating countries for information collection is significantly different. In this regard, the 2009 annual plans and implementing activities were identified and developed for each participating country at the meeting. Tuna landing sites information collection by the enumerators of each country were also identified before embarking to the tuna data collection in early of 2009.

During the 2nd Working Group Meeting held in 2009, 10 years data of tuna production collected during 1997-2007 based on their fisheries statistics were reported. Another progress report was made on the outcome of data collection at selected landing sites in each IPTV country carried out during 6-8 months period of implementation. In addition, it was concluded that one-year-cycle of information collection on tuna landing production at the selected landing sites should be completed under the project's support together with the support from their respective countries. To achieve this goal, the project plan of activities from late 2009 until early of 2010 was finalized as well as discussion on the future activities for IPTV countries including the developing of fishing logbook or catch documentation system to support proper tuna data collection.

At the 3rd Meeting held in 2010, the Working Group Members were requested to present their progress of work on data collection by enumerators at the selected tuna landing site since 2008 to date as well as to finalize the future plans and activities to be implemented by each countries based on the current situation. The meeting finally recommended that the project activities should also include promotion on the use of tuna fishing logbook in order to obtain more reliable information/data on. Furthermore, the meeting suggested the project to put more effort in setting up minimum requirement of information collection through the use of fishing recording sheet. In order to do so, pilot activity in the IPTV countries will be implemented in their major selected tuna landing sites. However, due to the limitation of the budget in the year 2010, the project activities suggested by the 3rd meeting will be implemented in the following years.

2. PROGRAM

2.1 Objectives

The objectives of this project are to:

- 1) Evaluate status of tuna capture fisheries in the Southeast Asian waters;
- 2) Evaluate tuna and neritic tuna species caught in the EEZ of the Southeast Asian waters;
- 3) Establish data/information collection framework for clarification of the tuna fishing ground in the Southeast Asian waters; and
- 4) Establish a database system for tuna fisheries information collection in the Southeast Asian region.

2.2 Program Description

The current program of activities implementing under this project focuses on the works with IPTV countries. Based on the framework developed with the project initiative, tuna information on the origin of the tuna and neritic tuna species caught (at the selected landing sites in the IPTV countries) is now ongoing investigated by using one-year cycle data collected by the countries. As suggested by the members of the Working Group, it is planned that pilot program on the use of tuna fishing logbook will be developed in close consultation with the countries considering the current situation of each IPTV country.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
1.Consultation/working party meeting	May June – Dec June – Dec	Organized the 3 rd Working Group of Highly Migratory Species Information Collection Meeting, 24-25 May 2010, Phuket, Thailand Consulted with IPTV countries (working party members) for drafting the follow-up plan of activities for continuation of the project's support on tuna information collection. Supported and implemented pilot study on using tuna fishing logbook for improvement of tuna information collection in IPTV countries.
2.Development of regional tuna database	Jan – Dec	Reviewed data worksheet submitted by Working Party Members at the 2 nd and 3 rd Meeting that being used as starting point for development of tuna regional database in Southeast Asia.
3.Data collection and analysis	Jan – Dec	Analyzed data/information submitted by the Working Group Party Members (1 st , 2 nd , and 3 rd Working Group Meeting).

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

(1) Theme: Fishery management of shared stocks in the Southeast Asian waters
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • Tuna production landed in major tuna exporting countries in the Southeast Asia are not actually reflect to the current situation of tuna resources caught in the Southeast Asian waters; • In some Member Countries, tuna fishery data collection system is not in place (such as Vietnam); and • Need on development of a new framework to collect information at landing sites by including origin of fishing grounds/areas to support proper tuna management of the respective countries.

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • Better understanding on the status of tuna fisheries/production in the Southeast Asian waters • Use of an improved system for tuna landing data collection for further improvement of tuna statistics • Use of tuna fishing logbook that developed/promoted/harmonized by the project

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Establish the working group party and conduct annual meeting</p> <ul style="list-style-type: none"> • Establish the working group party to initiate/facilitate work related to tuna data and information collection. In the 1st Phase of the project, selected 4 participating countries, namely Indonesia, Philippine, Thailand, and Vietnam • The Meeting of the Project Working Party will be annually conducted the aim to: monitor the progress of work supporting by the project; to discuss/identify key issues for improvement of data and information collection at the landing sites.
<p>Step 2: Regional analysis on tuna production</p> <ul style="list-style-type: none"> • Based on data and information collected in the project participating countries, the regional analysis will be conducted to better understanding the trends of tuna production. • Identify the landing sites for future improvement of the data collection on tuna fisheries.
<p>Step 3: Implementation of the data collection and analysis</p> <ul style="list-style-type: none"> • Identify the landing sites for data collection; hire enumerator to monitor and record the catch landing at the selected sites. • Analysis on the status of tuna resources in the Southeast Asia waters based on tuna production by countries by species. • Provide a set of technical data for further consideration by the country(s) for improvement of information collection on tuna catch in their respective country(s).
<p>Step 4: Development for the regional tuna database</p> <ul style="list-style-type: none"> • Develop the tuna database software. • Develop the tuna database via online internet.
<p>Step 5: Final consultation and information dissemination</p> <ul style="list-style-type: none"> • The evaluation on the result from the project implementation will be made through the organization of the regional technical consultation. • To publish the outcomes of the project implementation.

3.2.4 Activities in the current program:

(1) Current position of the program: Step 3
(2) Project duration: 2008-2012
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • Organize working party meeting • Regional synthesis on tuna fisheries in the participating countries • Develop tuna database software/system

3.2.5 Progress and achievements of the current program:

<p>(1) Main activities conducted in the current program</p> <ul style="list-style-type: none"> • Working group meetings were conducted (3 times during 2008 to 2010) • Regional analysis covering IPTV countries have been conducted • Catch data collection based on the new framework have been conducted in the IPTV countries • Tuna database have been developing
<p>(2) Main achievements till the end of 2010</p> <ul style="list-style-type: none"> • Drafting the regional analysis on the trend of tuna production in the Southeast Asia • Ongoing process for system planning with some information inputs for the tuna database • Mechanism for tuna data collection system established in major tuna landing sites in Vietnam initiated by the project
(3) Outcomes during the program period and expected achievement rate till the end of 2010

Expected outcome	Achievement rate (%)
Status of tuna fisheries in the Southeast Asian Waters	10%
Tuna database development based on information collected at tuna landing sites in the participating countries	10%
Promotion on the use of fishing logbook system for sustainable management of tuna fisheries	10%
Formulation of the working group party on information collection of tuna fisheries from concerned Member Countries	100%

3.2.6 Evaluation of Program activities in 2010

The project completed one-year cycle of data and information collection at the selected sites in the IPTV countries. The regional analysis based upon this set of information is now ongoing process. During the last Working Group meeting, it was strongly suggested the project to find ways to encourage or embark with the use of tuna and neritic tuna species fishing logbook onboard fishing vessels. It was concluded during the last meeting that improvement of information collection on tuna in the region should be made through the improvement of recording on number of fishing boats (small- and commercial-scale) with collaboration and coordination with key private sectors (exporters).

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

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

Activity 1: Consultation/working party meeting

In 2011, the 4th working party meeting will be organized in order to obtain the progress of the pilot program with the participating countries on the use of tuna fishing logbook for recording tuna catch at sea. The meeting will also discuss on further promotion on the use of tuna fishing logbook in the Southeast Asian region with the aim to produce better information and data, which could support the national initiatives related to tuna fisheries management. As the implementation period of the project is planned to be ended by 2012, it is therefore envisaged that future plan for continuation of the project to be implemented from 2013 and onward will be discussed/drafted.

Activity 2: Development of the regional database for tuna

Based on the data inputs from the working party members, development of the tuna regional database will be continued. It is envisaged that information collection at tuna landing sites for the working party non-member(s) will also be initiated as the additional input to the current database development. As the regional database is a long-term process, and the project should be not completely implemented by the end of 2012. The project coordinator will therefore coordinate with other regional program of activities in order to keep these initiatives for the benefits of SEAFDEC Member Countries.

Activity 3: Data collection and analysis

Analysis of information and data collected by the working party members as well as the result from the pilot study on the use of tuna fishing logbook (for the fishing boats catching in EEZ) will be analyzed. National workshop on the use of tuna fishing logbook will be organized at 2 selected countries including Indonesia and Vietnam. It is planned that topics for the support from the project to improve tuna information collection will be decided and discussed during the 4th meeting of the working party. Furthermore, evaluation of the project implementation during the 5-year period will be conducted.

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1. Consultation/working party meeting	July	Organization of the 4 th Meeting of the Working Group on Highly Migratory Species Information Collection. The meeting aims to: discuss the major outputs from the project 5-year implementation; identify the needs for continuation of the SEAFDEC to support information collection for tuna and neritic tuna caught in this region.
2. Development of regional tuna database	Jan – Dec	Continuation on the development of regional tuna database.
3. Data collection and analysis	Jan – Dec	Continue to support IPTV countries in collecting information and data on tuna catch. The topic for the support will be discussed during the 4 th meeting of the working party.

4.2 Expected Outcomes in the Year 2011

<p>The 4th Meeting of Working Group will be the main activity in the year 2011, it is envisaged that the following issues will be discussed during the meeting:</p> <ol style="list-style-type: none"> 1. Framework of the regional tuna database based upon the one-year cycle information collection at the selected sites in the IPTV countries; 2. Draft plan of the pilot program to promote the use of tuna fishing logbook will be discussed and finalized; and 3. Ways to get involvement from the private sectors into the process of information collection.
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PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Deep-sea Fishery Resources Exploration in the Southeast Asian Waters
Lead Department:	Training Department
Lead Country:	Thailand
Total Duration:	2008-2012
Proposed Budget:	35,000 USD

1. INTRODUCTION

Due to the trend of depletion of the inshore/coastal fisheries resources in the Southeast Asian Countries in conjunction with the fuel crisis that make many fishers suffering, some fishers have to stop their operation and change to other business. In other hand, this automatically reduces the fishing capacity in the sense, goes in line with national fishery policies in many countries. However, this trend of depletion may reduce the supply of seafood materials to many fish processing industries in the region and will also reduce the food supply to the global market in the near future. From the point of view of fishery policy maker or government, searching of new fishing ground is one of the essential research works under the national program. This research work is very much needed to get fully support in terms of funding as well as various capacity buildings.

Considering the geographic features in the Southeast Asian waters, more than 50% of the sea areas are identified as deep-sea, whereas utilization of those resources have not been fully initiated. This is due to insufficient information on the species composition and what will be potential resources. In addition, it is cleared that research vessels for deep-sea survey seem to be one of the limitation that many countries in the region are facing with. There are not many research on scientific instruments, type of fishing gears for fish samplings, and deep-sea resource persons. To encourage members to initiate the deep-sea resources exploration, therefore, modification of sampling gears for those research vessels is also essential.

From the point of view of the international concerns on the ecosystem approach for the deep-sea fisheries, to provide better understanding of the Member Countries on the deep-sea issues, therefore, exploration of the deep-sea resources through this program are needed for further sustainable development and management of fisheries.

2. PROGRAM

2.1 Objectives

The objectives of this project are to:

- 1) Provide technical support of exploration of deep-sea living resources in the Southeast Asian waters by using M.V. SEAFDEC 2 and/or by other research vessels in collaboration with the Member Countries;
- 2) Investigate the impact of deep-sea trawling on the seabed ecosystem;
- 3) Enhance human resources capacity on the deep-sea resources exploration; and
- 4) Support the national resources survey(s) in collaboration with the Member Countries by using their research vessels for improvement of deep-sea resource sampling gears and methods.

2.2 Program Description

SEAFDEC has supported exploration of fishery/living resources in the deep-sea waters of the Southeast Asia through various programs in close collaboration with its Member Countries. The overall aims of this program are: to explore ways to collect the information on the deep-sea fishery resources in the Southeast Asian waters including the support on actual survey using SEAFDEC's research vessels or national research vessels; to encourage SEAFDEC's Member Countries to explore deep-sea fishery resources; and to build human resources capacity on deep-sea fishery resources exploration.

As far as ecosystem-based approach to fisheries management is concerned, there is the need to understand the impact of fishing to deep-sea ecosystem. This program of activity will therefore provide opportunity to scientists from SEAFDEC's Member Countries to obtain better understanding and knowledge on impact of fishing on deep-sea ecosystem (particularly on the seabed) and also to share their experience related to deep-sea fishery resources exploration.

Various regional activities (including a series of expert consultation/meetings, on-the-job training, and information dissemination on the deep-sea resources exploration in the Southeast Asian waters) have been conducted to gather deep-sea scientists and fishery researchers to discuss on the topic focusing on the deep-sea considering *Vulnerable Marine Ecosystems* of the ocean. In addition, this project also provides a platform for regional important discussion on the issue related to the deep-sea fisheries resources of the region.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
1. Support deep-sea fishery resources survey	May	1) Conducted technical consultation visit to Brunei for the research and cruise plan of M.V. SEAFDEC 2
	Sep – Oct	2) Supported technical staff of SEAFDEC/TD to join the actual survey in the actual cruise survey on deep-sea in Brunei water
	Sep – Oct	3) Technical support on sampling gears, survey equipments, etc. during the survey conducted in Malaysia and Brunei
2. Deep-sea ecosystem and impact from fisheries	Aug – Sep	1) Information collection on the impact from fishing to deep-sea ecosystem through organization of the Expert Meeting on the Study of the Impact from Fishing to Ecosystem, 31 August to 2 September 2010, Bangkok, Thailand
	Oct – Dec	2) Preparation of the publication of the Meeting
	Oct – Dec	3) Follow-up actions based on the recommendation made at the Meeting
3. Development and improvement of deep-sea sampling gears and technologies	Mar – Sep	1) Improvement of design and construction to be suitable for sampling by M.V. SEAFDEC 2, including deep-sea trap and IKMT
	Sep – Oct	2) Construction of modified Agazzi trawl for the actual cruise survey in Brunei
4. HRD program on deep-sea sampling techniques	Oct	1) Organization of the Training Workshop on Research Methodologies for Study on Impact of Fishing on Deep-sea Ecosystem, 16-20 October 2010, Brunei
	Oct – Dec	2) Collection of references related to deep-sea research and exploration through the organization of the Training Workshop in Brunei
5. Information dissemination	Oct – Dec	Publications of the reports of the Expert Meeting, and the Training Workshop organized in 2010

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

(1) Theme: Exploration of new fishing ground in deep-sea areas and investigation on impact of fishing activities to the deep-sea ecosystem

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

- Significant depletion of inshore/coastal fisheries resources in the Southeast Asian Countries
- Approximately 50% of sea area in the region was identified as deep-sea waters, whereas fisheries resources in the deep-sea areas are not fully utilized.
- Insufficient information on the potential fishery resources in the deep-sea areas
- Insufficient information on the impact of fishing activities to the deep-sea environment, focusing on the seabed ecosystem.

3.2.2 Expected final goals of the program:

- Information available for potential fishery resources in deep-sea areas in the Southeast Asian region
- Information available on the impact of fishing activity to the deep-sea ecosystem
- A set of recommendations for the medium- and long-term development and management plan of activities for utilization of fishery resources in the deep-sea in the Southeast Asian region

3.2.3 “Steps” toward achieving final goals:

Step 1: Data and information collection on the deep-sea and impact from fishing to ecosystem

- Fishery resources exploration in the deep-sea areas in the Southeast Asian region
- Conduct/support deep-sea fisheries resources exploration by using M.V. SEAFDEC2 and other national research vessels
- Organization of training/workshop on the exploration methodology for the deep-sea fishery resources
- Study on impact of fishing activity to the deep-sea ecosystem

Step 2: Data analysis and sharing experience among deep-sea scientist/researchers.

- Data analysis on the potential deep-sea fishery resources as output from Step1
- Organization of the workshop on exploration methodology for the deep-sea fishery resources

Step 3: Information dissemination and establishment of the regional network on the deep-sea fishery

- Establish a regional network on deep-sea fishery resources exploration
- Develop and facilitate the process to formulate policy recommendations for deep-sea fishery management plan for utilization of the deep-sea fishery resources in the Southeast Asian region
- Disseminate, sharing, and exchange information collected from the project’s initiatives with the SEAFDEC Member Countries and other relevant organization/initiatives

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1~2

(2) Project duration: 2008-2012

(3) Main activities:

- Support deep-sea fishery resources survey
- Research and Development on fishery resources exploration in the deep-sea areas in the Southeast Asian region
- Study on the impact of fishery to deep-sea ecosystem
- Training/workshop on the exploration methodology for the deep-sea fishery resources
- Information dissemination

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> • Support deep-sea fishery resources survey by using M.V. SEAFDEC 2, M.V. SEAFDEC, M.V. DA-BFAR, etc. • Research and Development on fishery resources exploration in the deep-sea areas in the Southeast Asian region <ul style="list-style-type: none"> ▪ Design and construct deep-sea sampling gears and improvement of their sampling efficiency with minimum impact to seabed. ▪ Carry out deep-sea resources actual sampling using the developed deep-sea sampling gears in collaboration with the Member Countries • Study on the impact of fishery to deep-sea ecosystem <ul style="list-style-type: none"> ▪ Information collection on the impact of the fishing through expert consultation and review of references/documents ▪ Publication on the review work on deep-sea resources survey in the Southeast Asian region • Publication on the review work on taxonomy of deep-sea fish • Training/workshop on the exploration methodology for the deep-sea fisheries resources <ul style="list-style-type: none"> ▪ Organization of the series of Regional Workshop/Meeting, since 2008 ▪ Organization of the series of HRD program to enhance human/institutional capacity on deep-sea fishery resources exploration ▪ Organization of the series of expert meeting to support the study on the impact from fishing to marine ecosystem • Information dissemination <ul style="list-style-type: none"> ▪ Disseminate information collected from actual survey of deep-sea fishery resources to Member Countries and other relevant initiatives ▪ Sharing and exchange knowledge with experts and scientists on deep-sea fishery resources and impact of fishing on deep-sea ecosystem through various communications/meetings • Assist Member Countries in data analysis for their information/data collected by the collaborative cruise survey in their EEZ during the past years. 	
(2) Main achievements till the end of 2010	
<ul style="list-style-type: none"> • Data collection on potential deep-sea fishery resources through actual survey by M.V. SEAFDEC 2 and other research vessels • A series of reports on the regional event organized by the current project • Publication on Standard Operational Procedure for deep-sea resources sampling gears • A set of information on deep-sea fish resources (specimens, guide-book, posters, leaflet, CDs, website, etc.) • A set of recommendations for future development of deep-sea fisheries • Developed and improved deep-sea sampling gears in collaboration with experts in Member Countries 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010	
Expected outcome	Achievement rate (%)
Support deep-sea fishery resources survey	100%
Research and development on fishery resources exploration in the deep-sea areas in the Southeast Asian region	70%
Study on impact of fishing activity to deep-sea ecosystem	70%
Training/workshop on the exploration methodology for the deep-sea fishery resources	100%
Information dissemination	100%

3.2.6 Evaluation of Program Activities in 2010

Technical support to the Member Countries on actual deep-sea fishery resources survey was completely implemented in the EEZ of Malaysia and Brunei Darussalam. Regional meeting related to the study on the impact of fishing on deep-sea ecosystem was initiated with the assistance from various resource persons both inside and outside the region. During the regional meetings conducted under this project, it could be concluded that the stage of deep-sea fisheries development in the Southeast Asia can be categorized into two groups. The first group has in place technical staff and sampling gear/methodology and research vessels facilities, whereas the other group is still less developed in both human resources capacity and

capacity to carry out the exploration. The program of activity under this project would be readjusted to initiate both groups by providing them the appropriate support on deep-sea fishery resources exploration.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

The project will be implemented through the following activities:

Activity 1: Support Deep-sea Fishery Resources Survey

In 2011, supports to the Member Countries on the deep-sea resources exploration will be continued. The actual survey in the EEZ of the Member Countries by using M.V. SEAFDEC 2 will be carried out based upon the request. In addition, it also includes the technical staff supporting actual deep-sea resources survey that will be carried out by national initiatives by using their national research vessels, namely M.V. DA-BFAR, R.V. Chulaphorn, R.V. Chakthong, etc. Technical visit of TD technical staff to the requesting Member Countries and technical exchange through various communication tools will be made. For long-term process of developing deep-sea fisheries resources, the project will facilitate the formulation of the regional plan of activity for deep-sea resources exploration in consultation with the regional/national expert.

Activity 2: Deep-sea Ecosystem and Impact from Fisheries

Reporting and updating information on deep-sea specimens, based upon the national research and regional collaborative programs/surveys conducted in the previous years, will be carried out and made available through SEAFDEC various media and the project website. With the aim to share information on the issue related to the deep-sea fishery resources, at the same time, collaboration and coordination work will be continued. A small group of expert consultation will be organized in order to summarize the current outcomes from the project implementation with the priority will be given to the results from the resources survey and literature review for further appropriate follow-up actions by SEAFDEC in the following years.

Activity 3: Development/Improvement of the Deep-sea Fish Sampling Gears/Technologies

Based on the previous work conducted by regional collaborative program and national initiatives related to deep-sea resources exploration, the project will keep momentum to develop the appropriate sampling gears/methods to collect specimens from the deep-sea area. A series of actual sea trial for improvement of sampling gears/technologies will be conducted by using research vessels of SEAFDEC or other national research vessels as already mentioned above.

Activity 4: HRD Programs on Deep-sea Research and Sampling Techniques

Various HRD programs of activity will be carried out to assist Member Countries based upon the actual research activities and needs of the countries. Capacity of the human resources on the deep-sea resources exploration includes: sampling methods, identification and taxonomy of deep-sea species and larvae, promote idea and concept on responsible fisheries in the deep-sea areas, development of appropriate sampling gears for the deep-sea specimens sampling, etc. The program also includes capacity building for young staff of TD on deep-sea fishery resources exploration in perspective of the international concerns on the ecosystem-based approach for sustainable management and development of deep-sea fisheries for the Southeast Asian region. As there are the urgent needs on the human resource capacity building in the field of deep-sea fisheries, the project will facilitate medium-or long-term HRD program development for the scientist and researches in the region through communication with the potential financial supporters.

Activity 5: Information Dissemination

Major outputs and outcomes from the project implementation will be disseminated and shared among the Member Countries and other relevant initiatives, and to be also used as the regional and national references. Coordination and collaboration among the members of the regional network on deep-sea fishery resources established in June 2009 will be updated and expanded.

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1.Support deep-sea fisheries resources survey	Mar (tentative)	1) Technical consultation visit to the Member Countries for finalizing plan and arrangement of the collaborative program.
	Sep – Oct (tentative)	2) Support TD technical staff to join the deep-sea actual survey.
2.Deep-sea ecosystem and impact from fisheries	Mar	Organization of the 2 nd expert meeting on deep-sea fishing and its impact to marine environment with specific aim to develop a 5-year plan of activity for deep-sea resources exploration in the Southeast Asian waters.
3.Development and improvement of deep-sea sampling gears and technologies	Jan – Dec	1) Improvement of design and construction of the sampling gears to be suitable for using on M.V. SEAFDEC 2
	Aug (tentative)	2) Organization of the regional training workshop on identification of deep-sea living organisms
4.HRD program on deep-sea sampling techniques	Jan – Dec	1) Assist Member Countries to reconfirm the deep-sea species identified by the countries
	Oct (tentative)	2) Organization of the regional training workshop on impact of fishing on marine ecosystem through the study and identification of deep-sea living organisms
5.Information dissemination	Nov – Dec	1) Produce the publications and reports of the events organized/carried out by the project
	Jan – Dec	2) Update scientific information obtained from the project implementation and other relevant technical knowledge related to deep-sea resources exploration, through project website.

4.2 Expected Outcomes in the Year 2011

It is planned that a medium-term plan (for 5-year implementation) of project activities to support the deep-sea fishery resources exploration in the Southeast Asian waters can be developed in 2011. This aims to prepare the document on time to continue the project implementation. It is also expected that the capacity building on identification of deep-sea living organisms will be continually conducted. Knowledge and technical documents of the project will be updated and disseminated through the project website.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Development of Regional Database for Fisheries Management
Lead Department:	Training Department and the Secretariat
Lead Country:	Thailand
Total Duration:	2008-2012
Proposed Budget:	7,620 USD

1. INTRODUCTION

To efficient use the regional database, especially for the Member Countries, harmonization/standardization of the national data and information inputs are needed. Appropriate fisheries database system can then be facilitated and generated the reporting and analyzing process. SEAFDEC Training Department (TD) has initiated and developed the regional database and its system to: i) develop fisheries statistical bulletin for the South China Sea; and ii) facilitate development the new harmonized framework and format of fisheries data reporting with FAO. Furthermore, TD has also supported the Secretariat on initiation of data input from the participating countries by providing their data input format since the year 2008. Recently, TD also assists MFRDMD in developing the database system of the tagging program for economic importance of pelagic species in the Southeast China Sea and Andaman Sea.

2. PROGRAM

2.1 Objectives

- 1) Develop/maintain the regional database services in order to support data analysis of the tagging other relevant programs;
- 2) Enhance human capacity of the Member Countries on the use of Regional Fishery Statistics and database particularly for the less-developed countries;
- 3) Develop interface to link all database relevance to fisheries information for fisheries management at SEAFDEC website.

2.2 Program Description

Program of activities implementing under this project includes maintain and improvement of regional fisheries statistics under new and previous framework of the regional fisheries data information collection. Various human resource capacity building programs (*e.g.* the use of stand-alone database software for management of fishery data and information collected at landing sites) for the database developer of the Member Countries are also included under this project. The project also provides a server and the system for regional database to support sustainable development and management of fisheries in the region.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
1. Development of regional database	Jan – Dec	1) Continue to maintain regional fishery statistic and database
	Jan – Dec	2) Continue to develop and maintain regional tagging database

	Jan – Dec	3) Improve fishing ground information system for pelagic fish (continuation of the trial phase)
2. Building the human resources capacity on utilization of database	Mar	1) Participating in the 3 rd Core expert meeting for Tagging program, organized by SEAFDEC/MFRDMD
	Dec (tentative)	2) Organization of the human capacity building program for Brunei fisheries statisticians as requested
3. Collaboration with organization/institution	Jan – Dec	Keep update and communicate with other relevant initiatives, organizations for the technical/information exchange for improvement of fishery information and database system in the region
4. Information dissemination	Jan – Dec	Dissemination of information package related to database through participation of staff at relevant meetings

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

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

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • Improvement/establishment of a regional database on fishery resources in South China Sea and Andaman Sea • Improvement of regional and national fishery statistics in less-developed countries in the region • Improvement of human/institutional capacity in using database for sustainable fishery management in less developed countries in the region

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Capacity building for human and institutional resources for sustainable management of fishery resources in South China Sea and Andaman Sea, focusing on improvement of fishing information system</p> <ul style="list-style-type: none"> • Develop/promote the regional database on fishery resources in South China Sea and Andaman Sea using data collected from actual surveys, fish landing site, and review on available information • Develop/improve national and regional fishery statistics and its system in the Southeast Asian region to support less-developed countries on the use of fishery statistical database • Enhance human/institutional capacity in using of the regional database for sustainable fishery management through various programs/activities • Strengthen collaboration and coordination with other relevant initiatives to avoid duplication of program/activity
<p>Step 2: Develop and maintain: i) fishery resources database to support data analysis for tagging and other relevant programs/activities; ii) fishing ground information and its system for pelagic resources in the Southeast Asian region</p> <ul style="list-style-type: none"> • Provide support to develop/maintain fishery resources database for SEAFDEC relevant initiatives • Maintain system of the fishing ground information on pelagic fishery resources in the Southeast Asia

<p>Step 3: Information dissemination and continue promotion on the use of regional/national database for sustainable fishery management in South China Sea and Andaman Sea</p> <ul style="list-style-type: none"> • Provide online database service to support the less-developed countries in the region in order to improve their fishery resources.
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3.2.4 Activities in the current program:

(1) Current position of the program: Step 2 and 3
(2) Project duration: 2008-2012
<p>(3) Main activities:</p> <ul style="list-style-type: none"> • Develop and maintain regional database • Build human resources capacity for the use of database • Collaboration with other relevant initiatives, organizations, and partners • Information dissemination

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> • Develop and maintain regional database <ul style="list-style-type: none"> - Hired an assistance database administrator - Setup internet system for database service • Build human resources capacity for the use of database <ul style="list-style-type: none"> - Organization of the onsite training on the use of database for pelagic resources to analyze fish landing data for fishery officers of Cambodia, 16-20 February 2009 - Organization of the onsite training on the use of database for pelagic resources, Brunei, November 2010 • Collaboration with: i) relevant initiatives, organizations and partners; ii) tagging program of MFRDMD <ul style="list-style-type: none"> - Assist and support regional fishery statistic project of the SEAFDEC Secretariat • Information dissemination • Distribution of the media for database exchange and promotion of the work/output from this program 	
(2) Main achievements till the end of 2010	
<ul style="list-style-type: none"> • Development of the regional fishery statistics – a new framework – streamlining SEAFDEC and FAO fishery statistics data input and reporting • Human capacity building on the use of fishery database for fishery resources management in less-developed countries in the region • Information exchange mechanism established among SEAFDEC and other relevant initiatives on improvement of fishery statistics/database • Distribution of the stand-alone database software for analysis of pelagic fish catch landing 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010	
Expected outcome	Achievement rate (%)
Database development	90%
Enhance human resources capacity on utilization of the fishery database	100%
Information dissemination	90%

3.2.6 Evaluation of Program activities in 2010

The project has maintained the database and system for the regional fisheries statistics (covering both newly established framework as discussed and harmonized with FAO and others; and maintain of the previous regional database). With the aim to support the ongoing program on tagging implementing by SEAFDEC/MFRDMD, the development of the regional database for tagging program of pelagic fisheries resources is now ongoing.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

Activity 1: Develop and Maintain Regional Database

The project will continue to improve the regional database, in particular to less-developed countries, based on data collected from various sources including actual surveys, catch landing, and from other available information. In response to the request from the Member Countries on medium- and long-term use of fishery statistics and database initiated by SEAFDEC, the Regional Fishery Statistics and Fishery Information System in Southeast Asia Countries will be continuously improved. The activity also includes the support for improvement of the database of tagging program on economically-important pelagic species; and development of database for vessels registration/licensing program (implementing by MFRDMD and SEAFDEC-Sida Program, respectively).

Activities 2: Build Human Resources Capacity for Utilization of the Database

With the aim to utilize the fishery statistics and database, continuation of the support to the less-developed countries in the region in terms of human resources capacity building will be conducted. Main activity under this category includes capacity building program to support the regional fishery statistics and databases for economically-important pelagic species. In addition, formulation and development of the national HRD program on the use of database will also be provided depending on the request from Member Countries. Information package (*i.e.* promotion of the database software, guidelines, handbooks, etc.) will be continued to develop in order to support the Member Countries on the use of fishery databases and information system.

Activity 3: Collaboration with other Relevant Initiatives, Organizations, and Partners

Collaboration with other relevant initiatives, organizations, and partners, in particular to the promotion on the use of fishery statistics/database and information will be the major activity under this category. This aims to facilitate transfer of information/technology and technical cooperation among the Member Countries and other relevant initiatives.

Activity 4: Information Dissemination

The developed fisheries databases, information system/services will be provided to the Member Countries through various ways, such as internet online services, information/training packages, brochures, booklets, CDs/DVDs, participation of the staff to the meeting/event organized by other relevant initiatives.

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1. Development of regional database	Jan – Dec	1) Continue to maintain regional fishery statistics database 2) Continue to develop and maintain regional tagging database 3) Continue to improve fishing ground information system for pelagic fish
2. Building the human resources capacity on utilization of Database	Jun – Jul	1) Organization of the human resources capacity building program as requested (tentatively Thailand, Malaysia)

3. Collaboration with organization/institution	Jan – Dec	1) Strengthen collaboration among other SEAFDEC relevant initiatives and projects in order to assist them in terms of database development, for example SEAFDEC program on vessel registration and license
	Jan – Dec	2) Strengthen collaboration and coordination with other relevant agencies, including national fisheries database, etc.
4. Information Dissemination	Jan – Dec	Dissemination of information obtained from the project implementation through SEAFDEC website, CDs, and other media

4.2 Expected Outcomes in the Year 2011

The national fisheries statistic data from the Member Countries in the year 2008 is expected to be completed based on the inputs from the countries during the first half of the year 2011. However, it should be noted that the completion of the database input relies on the submission of national data. It is planned that the data inputs from respective countries on fisheries statistics for the year 2009 will be submitted to the project for further input into the regional database. Regarding the tagging program, its framework and format have been developed and launched for online input since early 2010. The project will maintain the format and provide technical advice to the project based upon the request from SEAFDEC/MFRDMD.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism.
Program Title:	Promotion of Rights-based Fisheries and Co-management towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management.
Lead Department:	The Training Department
Lead Country:	SEAFDEC member countries
Total Duration:	Year 2008-2012
Proposed Budget:	USD 42,000 (2011)

1. INTRODUCTION

The program is progressive impetus to promote co-management and rights-based fisheries for coastal fisheries management in the Southeast Asian region. Two strategies are institutional building and participatory mechanism taken an emphasis to encourage the program implementation. The institutional building is strengthening the practice of the regional guidelines for co-management using group user rights for small-scale fisheries in Southeast Asia. The institutional building is to gather all stakeholders to construct an enabling environment of sharing power, responsibility and function for fisheries management. All stakeholders exercise participating in decision-making process to formulate and regulate function, responsibility and authority for fisheries management through training workshop. The knowledge gained from the training workshop will be useful to stakeholders to apply the concept of co-management and rights-based fisheries which relies on their national fisheries legal framework to promote coastal fisheries management. Other strategy is participatory mechanism of co-management highlighted to promote the regional guidelines on the use of indicators for the sustainable development and management of capture fisheries in Southeast Asia. The appropriate participatory mechanism of co-management fosters interested parties participate in making decision process to either select best available information or adapt policies and management framework to obtain more responsible and sustainable future condition of fisheries resources.

2. PROGRAM

2.1 Objectives

- 1) To promote the applicable practice of rights-based fisheries and co-management towards institutional building of stakeholders for coastal fisheries management,
- 2) To introduce the appropriate participatory mechanism of co-management to foster the use of indicator for coastal fisheries management.

2.2 Program Description

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

facilitating local users to organize and institute their either group or management body responsible for fisheries resources management.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Fisheries co-management and rights-based fisheries are applicable approaches to fundamentally help reducing conflict among resource users to compete using common resources. Fisheries co-management is credible concept to provide an opportunity to user-based organization sharing and collaborating with government-based agencies to manage fisheries resources in both coastal and inland sectors. Meanwhile, rights-based fisheries are vigorously recommended to promote in order to secure resource users particular small-scale fishers accessing the right to fish. In addition, rights-based fisheries are reliable to apply into managing fishing capacity and efforts; consequently, fisheries resources are responsibly and sustainably utilized. This optimistic practice helps diminishing social conflict in competition of exploiting fisheries resources. Both coastal and inland fisheries management executed in ASEAN region have various type and strategy which varies from country to country. Fundamental strategy is based upon local resource users participating in decision-making process to alleviate conflict of interest among them. Lesson-learn and experience are relevant to local resource users' participation in both coastal and inland fisheries are worth to analytically identify into strategic implementation and outcome in conjunction with social, economic, biological and environmental aspects. Moreover, local resource users' participation, which is traditionally and customarily carried out in fisheries management, is important factor for further apply into an improvement of fisheries co-management and rights-based fisheries. An execution of fisheries co-management and rights-based fisheries are anticipated at least reducing conflict of interest, securing both livelihood and well-being as well as alleviating poverty.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

(1) Theme: Promotion of Rights-based Fisheries through Co-management Approach for Small-scale Fisheries in the Southeast Asian Region.

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

It is well recognized that coastal fisheries resources are over-exploited and impact to local community and fisher livelihood. Then the co-management and rights-based fisheries for coastal fisheries management in the Southeast Asian region have been promoted to the region in order to achieve coastal fisheries resources management by the local fishers. In the end of the year 2005, co-management using group user rights for small-scale fisheries was developed and distribution but it's quite new for the region and might be difficult to understand among fishers even through the fisheries officers and policy makers. The project aims to transfer the knowledge and skill on co-management concept and participatory approach on the areas of defining and sharing responsibility and function between local user-based management either body or organization and government-based agency to carry forward coastal fisheries management.

3.2.2 Expected final goals of the project:

- 1) To promote and strengthen fisheries officers and policy makers to comprehend the concept and regional guidelines for co-management using group user rights for small-scale fisheries in Southeast Asia and apply practicing in coastal fisheries management,
- 2) To clarify the importance, objectives and application of the regional guidelines strengthening small-scale fisheries to promote coastal fisheries management,
- 3) To facilitate participants sharing and exchanging experiences and views on small-scale fisheries strengthening coastal fisheries management.

3.2.3 “Steps” toward achieving final goals:

Step 1: To develop concept of co-management for small scale fisheries in the Southeast Asian region.
Step 2: To promote co-management approach for small-scale fisheries in the Southeast Asian region through training and workshop.
Step 3: To practice and expand co-management approach for small-scale fisheries in the Southeast Asian region.

3.2.4 Activities in the current project:

(1) Current position of the project: Step 2
(2) Project duration: 2008-2012
(3) Main activities The co-management and rights-based fisheries for coastal fisheries management in the Southeast Asian region have been promoted to the region in order to achieve coastal fisheries resources management by the local fishers.

3.2.5 Progress and achievements of the current project:

(1) Activities conducted in the current project	
<ul style="list-style-type: none"> Regional Training Course on Rights-based Fisheries and Co-management for Small-scale Fisheries and Management. Regional Training Course on Coastal Fisheries Management and Extension Methodology. 	
(2) Achievements at this moment	
<ul style="list-style-type: none"> Activities for strengthening capacity of fisheries official to comprehensively implement and promote co-management using group user rights to develop small-scale fisheries and its institution management have been conducted to some extent. Introduction of rights-based fisheries management has been presented to provide supportive tools for strengthening small-scale fishers clearly enrolling in coastal fisheries management. 	
(3) Expected outcome during the project period and expected achievement rate till next year	
Expected outcome	Achievement rate (%)
1. Strengthen fishing community organization and institution to take leading role in practicing rights-based fisheries and co-management for achieving coastal fisheries management.	60%
2. Recognize the practice of rights-based fisheries and co-management for coastal fisheries management at all level concerned in ASEAN Member Countries.	80%
3. Apply and use indicators as tool to promote participatory mechanism of co-management for coastal fisheries management.	60%
4. Promote skillful human resource capacity to encourage participatory mechanism of co-management for coastal fisheries management.	80%

3.2.6 Evaluation of Program activities in 2010

<p>The expected outcome is on 2) Recognize the practice of rights-based fisheries and co-management for coastal fisheries management at all level concerned in ASEAN Member Countries and 4) Promote skillful human resource capacity to encourage participatory mechanism of co-management for coastal fisheries management, could achieved based on the evaluation of regional training course on Rights-based Fisheries and Co-management for Small-scale Fisheries and Management as seen in <i>Appendix 1</i>. Meanwhile, expected outcome is on 1) Strengthen fishing community organization and institution to take leading role in practicing rights-based fisheries and co-management for achieving coastal fisheries management and 3) Apply and use indicators as tool to promote participatory mechanism of co-management for coastal fisheries management, was low performance because there was some project activity did not implement. Consequently, there was no inaction between ASEAN fisheries officials and local users such as Thai local users to practice and discuss on the concept of rights-based fisheries management and co-management for coastal fisheries management.</p>

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p>Activity 1: Promotion of strategic implementation of fisheries co-management and rights-based fisheries for enhancing good governance in coastal and inland fisheries management. Regional workshop will be organized to present, share and exchange means and strategies of implementing fisheries co-management and rights-based fisheries in fisheries management. Comment and recommendation gains from the workshop will be synthesized and formulated as strategic implementation. In addition, the workshop will provide considerable criteria to select a proper strategic implementation respond to good governance in coastal and inland fisheries management, respectively. An output of the workshop will be published as guidebook distributing to fisheries officials and local user organizations.</p>	5 days	
<p>Activity 2: Development of alternative fishing activities for small-scale fisheries in Southeast Asia. <i>Sub-Activity 1 <u>Literature review</u></i> Gathering information regarding problem of small-scale fisheries by illegal fishing in Southeast Asia, searching from document of Southeast Asia, and compile to be the secondary data. This activity will be carry out at the first quarter of year 2011.</p>	2 months	
<p><i>Sub-Activity 2 <u>Contact and interview fishery administration officers, local researchers, fisheries authorities, small-scale fisheries and commercial fisheries.</u></i> This sub-activity will operate at the first quarter until the fourth quarter of year 2011 with 7 SEAFDEC Member Countries namely, Thailand, Malaysia, Cambodia, the Philippines, Vietnam, Indonesia and Myanmar respectively. SEAFDEC plan to contact National coordinator of SEAFDEC Member Countries at the beginning for discussing on the best community of each country to collecting data. Questionnaire will be sent to 7 Member Countries for 50 copies each. After these questionnaires return to coordinator of Member Countries, SEAFDEC's team will be assigned to each country to elaborate and finalize the country status paper in a way of interviewing the fishermen in the community.</p>	8 months	
<p><i>Sub-Activity 3 <u>Analysis and report preparation</u></i> All returned questionnaires from SEAFDEC Member Countries will input and analysis by SPSS method, and report preparation and publication will be made at the fourth quarter of 2011 and the first quarter of year 2012, respectively.</p>	2 Months	

4.2 Expected Outcomes in the Year 2011

<p>Activity 1: Promotion of strategic implementation of fisheries co-management and rights-based fisheries for enhancing good governance in coastal and inland fisheries management. Traditional and customary practice of local resource users' participation in alleviating conflict of interest in utilizing common fisheries resources. The local resource users' participation is good lesson learn and experience to help promoting fisheries co-management and rights-based fisheries in Southeast Asian region. Tangible and effective strategy are essential information to customize other local resource users to manage fisheries resources for responsible and sustainable use of the resources and environment.</p>
<p>Activity 2: Development of alternative fishing activities for small-scale fisheries in Southeast Asia. The overview feasibility on traditional small-scale fisheries, community information and scientific database to formulate a proper action plan and best fitted activities for sustainability of small-scale and livelihood in Southeast Asia.</p>

Regional Training Course on Co-management Using Group User Rights for Enhancing Small-Scale Fisheries Development and Management on 20-28 September 2010

Summary report of the course evaluation

Representatives of ASEAN-SEAFDEC Member Countries are coming from Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, The Philippines, Thailand and Vietnam. They attended nine days course which included lecture and field trip study for concretely practicing and experiencing on site. To evaluate the regional training course, each participant personally completed the questionnaire. The result of the questionnaire analysis was presented at the end of the course for discussion.

The course evaluation consisted of six sections which were 1) expectation and their fulfillment; 2) course duration; 3) course content and resources person; 4) training methods, materials and facilities; 5) living conditions; and 6) others. The major result of the course evaluation is concluded in the following below:

Section 1: Expectation and their fulfillment

Regarding participant expertise and experiences, the result shows that they are 42% of fisheries management, the same 17% of fisheries management, as well as Aquaculture and fisheries management, 8% of fisheries management combining with fishing gear technology and fishery processing, 8% of fisheries management and fishery processing, 8% of aquaculture and fisheries management. They mentioned that their knowledge and skills gained from the training mainly concerned on knowledge resources management, fisheries management and co-management. Moreover, they confirmed that their expectations on the training were fulfilled especially on the site visits.

Section 2: Course duration

The result illustrates that 50% of participants agreed on the course duration was appropriated. Similar, the participants who did not agreed on the course duration 50%. Nevertheless, 50% of participants thought that the period is not appropriate and suggested that it should be 5, 12, 14, 15, and 21 days. In addition, 92% of participants agreed on the training period (September), but only 8% of participants thought that the period should be in February.

Section 3 Course Content

Regarding this section, the result of the evaluation shows level of participants' satisfaction on amount of content, applicability and teaching techniques of all subjects and included the practice of field trip study. The result shows that participants expressed their satisfaction on all of the identified subjects and site visits are average 83.7%. They had additional comments on subject which should be added such as;

1. Practical technology of co-management
2. Inland fisheries management
3. Strategic for safeguard the aquatic resources

In addition, the result also explains that 64% and 36% of participants indicated that the site visit is appropriate and appropriate but not completely, respectively. They added more reasons that site visit should be added more set-net and community fisheries and it should be omitted Ban Ao Moo and community forestry group. Moreover, the participants thought that the site visit was beneficial to them which rated 100 % of Yes. There were valuable recommendations;

1. Received many experiences and knowledge in the four sites- good governance in each group especially in micro credit in Ban Ao Moo and will extend the good idea to conduct in my work.
2. Understand problems when communities applied co-management.
3. Provide me with real life situations and experience that clearly reflected how co-management is done in those areas.
4. Learned techniques of co-management.
5. Knowledge can be used in areas of responsibility.
6. Some site visit is not necessary, if possible, change to set net in Rayong is better.

Section 4: Training methods, materials and facilities

The result of this section illustrates on level of participant's satisfaction on training method used in the course. The result indicated that 87.5% of satisfaction level was on lecture, 82.5% of site visit and practices, and the average of both categories is 85.0%. Regarding training materials, 83.3% and 52.0% of satisfaction levels were on training program and power point printed-out, respectively. The average for both training program and power point printed-out is 84.2%. In addition, the result of satisfaction level on training venues and facilities which were 90.0% at SEAFDEC training department and 87.5% at accommodation during site visit and the average of these is 88.8%.

There were recommendation and suggestion for improvement of training methods and materials that were:

1. Add activity and lecture
2. Three sites are better than 4 sites because the participants (with their group) have more time to make research and interview with the communities.
3. One topic should be lectured by one specific lecturer.
4. Must prepare document for training before starting in classroom or send by mail.

Section 5: Living condition

The level of participants' satisfaction is rated on SEAFDEC/ TD dormitory and New Traval Lodge Hotel in Chantaburi Province. The result of two venues shows the rate of each ordered places is 85.0% and 87.5%, respectively. The average for living condition is rated as 86.3%.

This section also explained three categories of relation, which are among resource persons and participants, among course staff and participants, lastly among participants. The result illustrates that 88.3%, 90.0% and 85.0% of each relation, respectively. The average shows as 87.8%.

Moreover, the participant gave their comments on some issues which should be improved to support more sufficient of the training that were:

1. SEAFDEC can give the more day to develop our knowledge.
2. Better interaction between and among the participants
3. The site selection for field trip could not be so far.
4. The person who will interview should include the member of the group for collecting the real data.

Section 6: Others

This section mainly focused on strengthen and weakness of the training which based on the comments and recommendation of the participants. Regarding strengthen of the training, participants cited that

1. Many knowledge we can get in the course.
2. Lecturers have experiences to share to the participants.

3. Participants come from various countries, can share experience and give more problems in applying co-management.
4. The appropriate number of participants, which is quite manageable.
5. It also provided the right amount of emphasis on lecture as well as on field visits.
6. It has a good mix of participants that could promote better understanding and cooperation within the Southeast Asian Region.
7. Course is very interesting, match the current problems.
8. Sociability
9. The flexibility of the staffs
10. A concept of management
11. Full of information, cooperation from the community (co-management).
12. The lecturer has both real knowledge and good method to explain the participants.
13. SEAFDEC-TD is located in good area.
14. The coordinators are easy to contact.

However, the weakness of the training was;

1. More any translator for English.
2. Participants come from some countries, thus cannot absolutely understand together, limitation in sharing knowledge because of language.
3. Participants did not share as much information as they could.
4. Participants do not meet course.
5. Coordination (communication) period to training is a little.
6. Document is too late for using.
7. The exchange of idea is too small.

In addition, they also suggestion for overall course improvement that were:

1. Maybe the next with different topic.
2. In general, this training course is good and efficient.
3. Participants' discussion should be encouraged more during lecture and site visit.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement
Lead Department:	Training Department
Lead Country:	Thailand
Total Duration:	2010-2014
Proposed Budget:	USD 75,800

1. INTRODUCTION

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

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

The expected outputs for the project include development of strategies and guide line for implementing resources enhancement program to promote sustainable fisheries resources enhancement, developing human resources in ASEAN Member Countries for the implementation of resources enhancement programs.

Project monitoring and evaluation will include annual progress reports, and end-of activity workshops.

2. PROGRAM

2.1 Objectives

This Project titled “Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds though Resources Enhancement” is being proposed to aim at;

- 1) Investigate/diagnose the fishery resource status of critical fishing grounds and fishery *refugia* sites;
- 2) Evaluate feasibilities and environmental/socio-economical impacts by resource enhancement practices; and
- 3) Develop regional management approach of coastal fisheries in the rehabilitated habitats in ASEAN Region.

2.2 Program Description

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

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

The expected outputs for the project include development of strategies and guide line for implementing resources enhancement program to promote sustainable fisheries resources enhancement, developing human resources in ASEAN Member Countries for the implementation of resources enhancement programs.

Project monitoring and evaluation will include annual progress reports, and end-of activity workshops.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
<p>1. Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices.</p> <p><i>Sub-Activity 1.1 Investigation / review of the status of critical fishing grounds in the Southeast Asian region.</i> Investigation of the existing basic information and research works in identifying the critical fishing grounds were conducted through deskwork and visit to the Member Countries. The results of the information gathering could be used for mapping and assessment by indices of the status of the critical fishing grounds in the region.</p> <p><i>Sub-Activity 1.2 Information collections on suitable designs of resource enhancement practices including their evaluation and promotion.</i> Information was conducted through the FRA/SEAFDEC workshop on artificial reefs for the enhancement of fishery resources in Tokyo during 11-12 November 2010. Information on placement of artificial reefs on scientific-based designs and evaluation methods executed in these areas were sharing among Southeast Asian countries and Japan.</p> <p><i>Sub-Activity 1.3 Workshop/Expert consultation on resource enhancement practices.</i> The workshop was conducted in conjunction with The 1st Regional Technical Consultation on Sustainable Fisheries Management in SEAFDEC/TD during 12-15 October 2010. The area of discussion was on “Resources Enhancement and Habitat Improvement”. The outcomes of workshop were the recommendation and plan of action for resources enhancement and habitat improvement with will present to Member Countries during The ASEAN–SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020.</p> <p><i>Sub-Activity 1.4 Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach.</i> The workshop was conducted in conjunction with The 1st Regional Technical Consultation on Sustainable Fisheries Management in SEAFDEC/TD during 12-15 October 2010. The area of discussion</p>	<p>Jan. - Dec.</p> <p>Jan. - Dec.</p> <p>Oct.</p> <p>Oct.</p>	

<p>ware on “Ecosystem Intervention” and “Reduction of Impacts from Fishing on Marine and Coastal Resources”. The outcomes of workshop were the recommendation and plan of action for ecosystem intervention and reduction of impacts from fishing on marine and coastal resources with will present to Member Countries during The ASEAN–SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020.</p> <p>2. Technical assistance led by pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds.</p> <p><i>Sub-Activity 2.1 Technical assistance in a pilot site for suitable designs of resource enhancement practices.</i> The environmental survey studies at the artificial reefs installation site in Banphe district, Rayong province, Thailand were conducted on 31 August to 4 September 2010. Several fisheries environmental parameters for species diversity study were conducted such as fishing operation survey by fish trap, bottom gill-net, hand line, benthos collection, juvenile fish trap and fish species diversity observation by underwater videos recorder. The recorded data are under analysing at TD. However, the duration of short period after artificial installation may not sufficient to observed any effect of artificial reefs to fisheries resources yet. Then, it need for longer period to evaluate/access the enhancement ability of artificial reefs to fisheries resources.</p> <p><i>Sub-Activity 2.2 Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management.</i> The selected pilot site for diagnosing fishing grounds and monitoring the achievements of rehabilitation program was proposed to changing to sea grass-beds in Krabi province, Thailand. The sea grass-beds around Sriboya island in Andaman sea was investigated on the area cover and sea grass species diversity. There are 11 sea grass species cover 2720 hectare of project site. The fisheries resources survey will be conducting on the last quarter of 2010.</p> <p>The first preliminary survey on identification and evaluation of fisheries ecosystem in the freshwater reservoir in Nam Ngum, Nam Houm, and Nam Mang in Lao PDR. were conducted during 8-11 June 2010. The objectives of the survey were observed and information collection on fisheries resources situation and environment condition of Nam Ngum, Nam Houm and Nam Mang reservoir as well as to discuss with DLF fisheries officer and other relevant institutions concern on the project operation plan. The survey also aimed to investigate for selection of an appropriated reservoir as pilot site of the program.</p> <p>3. Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region.</p> <p><i>Activity 3.1 Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness.</i> Information on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness are under compilation for disseminating to Member Countries.</p>	<p>Jan. – Dec.</p> <p>Jan. – Dec.</p> <p>Jan. – Dec.</p>	
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3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

(1) Theme: Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds through Resources Enhancement.

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

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

3.2.2 Expected final goals of the program:

- To optimize the use of fishing ground through resource enhancement programs,
- To develop human resources for the implementation of resource enhancement programs,
- To develop a guideline for implementing resources enhancement program,
- To formulate strategies and action plans in rehabilitating the selected critical fishing grounds,
- To enhance cooperation and collaboration among Member Countries to improve capacity building in rehabilitation of the critical fishing grounds,
- To provide a guidance on multifaceted fisheries habitat rehabilitation and management to enhance the fishing communities practicing in the importance of harmonization between sustainable fisheries management and environmental concerns,
- To facilitate community's initiative practicing on the coastal habitat rehabilitation and management particularly through the applicable practice of responsible fisheries in order to achieve sustainable coastal fisheries and environment friendly.

3.2.3 "Steps" toward achieving final goals:

Step 1:

- Information survey & method validation,
- Case study on selected site in Thailand, Philippines and Lao PDR,
- Workshop/Seminar.

Step 2:

- Data analysis and evaluation,
- Continue case study on selected site,
- Workshop/seminar,
- Technical transfer by capacity building to Member Countries.

Step 3:

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

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1

(2) Program duration: 2010-2014

(3) Main activities

- Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices,
- Technical assistance led by pilot project sites and capacity building on rehabilitation of fisheries

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| resources and habitats/fishing grounds,
• Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region. |
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3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
1) Investigation/review of the status of critical fishing grounds in the Southeast Asian region, 2) Information collection on suitable designs of resource enhancement practices including their evaluation and promotion, 3) Workshop/Expert consultation on resource enhancement practices, 4) Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach, 5) Technical assistance in a pilot site for suitable designs of resource enhancement practices, 6) Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management, 7) Capacity building on rehabilitation practices of fisheries resources and habitats/fishing grounds, 8) Capacity building on identification of critical fishing grounds and on regional habitat rehabilitation and management approach, 9) Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness, 10) Regional seminar for end of the project.	
(2) Main achievements till the end of 2010 (tentative)	
1) Investigation/review of the status of critical fishing grounds in the Southeast Asian region, 2) Information collection on suitable designs of resource enhancement practices including their evaluation and promotion, 3) Workshop/Expert consultation on resource enhancement practices, 4) Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach, 5) Technical assistance in a pilot site for suitable designs of resource enhancement practices, 6) Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management, 7) Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness,	
(3) Outcomes during the program period and expected achievement rate till the end of 2010	
Expected outcomes	Achievement rate (%)
• To optimize the use of fishing ground through resource enhancement programs,	30%
• To develop human resources for the implementation of resource enhancement programs,	20%
• To develop a guideline for implementing resources enhancement program,	30%
• To formulate strategies and actions plan in rehabilitating the selected critical fishing grounds,	20%
• To enhance cooperation and collaboration among Member Countries to improve capacity building in rehabilitation of the critical fishing grounds,	30%
• To provide a guidance on multifaceted fisheries habitat rehabilitation and management to enhance the fishing communities practicing in the importance of harmonization between sustainable fisheries management and environmental concerns,	30%
• To facilitate community's initiative practicing on the coastal habitat rehabilitation and management particularly through the applicable practice of responsible fisheries in order to achieve sustainable coastal fisheries and environment friendly,	40%

3.2.6 Evaluation of Program activities in 2010

Since, the allocated budget from Japanese Trust Fund V have to follow the Japanese fiscal budget year starting from May. Then, the program activities can be conducted from May to December 2010, only 8 months of year.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

(Planning for the project and activities (project/activity title and its short description) to be implemented as well as expected outcomes in the year 2011. In case that there are linkages among programs, the linkages and coordination mechanism among concerned programs should be provided.)

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p>1. Development on diagnoses of critical fishing grounds and evaluation by resources enhancement practices.</p> <p><i>Sub-Activity 1.1 Investigation/review of the status of critical fishing grounds in the Southeast Asian region.</i> Investigation of the existing basic information and research works in identifying the critical fishing grounds as well as spawning and nursery grounds known also as “Fishery Refugia” for commercial fishes including bottom and pelagic species, will be conducted. Information collection would be conducted through deskwork and visit to the Member Countries. The results of the information gathering will be used for mapping and assessment by indices of the status of the critical fishing grounds in the region.</p> <p><i>Sub-Activity 1.2 Information collection on suitable designs of resource enhancement practices including their evaluation and promotion.</i> Investigation of existing information and research works on the effective designs/models and methodologies for the resource enhancement tools/practices used in various fisheries habitat will be conducted. Information collection would be conducted through deskwork and visit to Member Countries.</p> <p><i>Sub-Activity 1.4 Workshop/Expert consultation on identification of critical fishing grounds and on regional habitat rehabilitation and management approach.</i> The workshops/expert consultative meetings will be conducted on identification of critical fishing grounds and fishery refugia. This activity will also be developed based on recommendations during the organized regional workshops. Local people’s indigenous knowledge and participation will be major factors to bring about and sustain an active fisheries habitat rehabilitation and management program. Scientific data and information will be supported by the views of the local people who will choose the right means or methods to strengthen their activities.</p>	<p>Jan - Dec</p> <p>Jan - Dec</p> <p>Sep</p>	
<p>2. Technical assistance led by pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds.</p> <p><i>Sub-Activity 2.1 Technical assistance in a pilot site for suitable designs of resource enhancement practices.</i> In this activity, selected onsite study and evaluation on enhancement practices including artificial reefs impact to</p>	<p>Mar, Jun, Sep</p>	

<p>fisheries resources and environment are conducted in Rayong province, Thailand.</p> <p>Sub-Activity 2.2 <i>Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management.</i> In order to develop strategies and actions in rehabilitating the critical fishing grounds as practical management measures, critical fishing grounds will be selected for diagnosing fishing grounds and monitoring the achievements of rehabilitation program in selected pilot sites such as sea grass-beds in Krabi province, Thailand.</p> <p>Also Case studies on the selected priority important fisheries ecosystem identified and evaluated in cooperation with Member Countries, will be conducted including a case study by SEAFDEC on identification and evaluation of fisheries ecosystem in the freshwater reservoir in Nam Houm, Lao PDR.</p> <p>Sub-Activity 2.4 <i>Capacity building on identification of critical fishing grounds and on regional habitat rehabilitation and management approach .</i> This sub-activity has the training course, which will strongly support the transfer of assistance both in term of technical and management aspects to promote the enhancement of fisheries habitat among Member Countries, to improve their capacities in the preservation and rehabilitation of critical fishing grounds and fishery refugia.</p> <p>3. Promotion and extension on rehabilitation of fisheries resources and habitat/ fishing grounds in ASEAN Region.</p> <p>Sub-Activity 3.1 <i>Information dissemination on rehabilitation of fisheries resources and habitats/fishing grounds for public awareness.</i> Documentation of the best practices of the project implementation will be carry out, which can be used as inputs in the preparation of IEC (information, education and communication) materials for dissemination in the region.</p>	<p>Feb, May, Aug, Nov</p> <p>Nov</p> <p>Jan – Dec</p>	
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4.2 Expected Outcomes in the Year 2011

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

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Chemical and Drug Residues in Fish and Fish Products in Southeast Asia – Biotoxins Monitoring in ASEAN
Lead Department:	Marine Fisheries Research Department (MFRD)
Lead Country:	Singapore
Total Duration:	4 years (2009-2012)
Proposed Budget:	USD 203,000

1. INTRODUCTION

Consumption of a variety of shellfish and fish causes an increasing number of human intoxications around the world. Around 400 poisonous fish species exist and, by definition, the substances responsible for the toxicity of these species are biotoxins. Marine biotoxins represent a significant and expanding threat to human health in many parts of the world. The impact is visible in terms of human poisoning or even death following the consumption of contaminated shellfish or fish, as well as mass killings of fish and shellfish, and the death of marine animals and birds.

The Codex Alimentarius Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) defined biotoxins as poisonous substances naturally present in fish and fishery products or accumulated by the animals feeding on toxin producing algae, or in water containing toxins produced by such organisms.

Monitoring seafood for toxicity is essential to manage the risks. However, there are several limitations in monitoring for toxicity such as the variation in toxin content between individual shellfish, different detection and even extraction methods for the various toxins requiring a decision which toxins one is testing for, and the frequency of sampling to ensure that toxicity does not rise to dangerous levels in temporal or spatial gap between sampling times or locations. Furthermore, the growing harvest of non-traditional shellfish (such as moon snails, whelks, barnacles, etc.) may increase human health problems and management responsibilities. (FAO, 2004)

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

2. PROGRAM

2.1 Objectives

The objectives of the project are:

- 1) To develop methodologies on biotoxins analyses through human resource training
- 2) To obtain an understanding of levels of biotoxins occurrences and incidences in fish and fishery products in ASEAN
- 3) To establish protocols for harmonization
- 4) To encourage Member Countries without monitoring system to establish their own system
- 5) To establish a directory of reference of experts and responsible persons
- 6) To enhance analysis capability to a acceptable confidence level with the 1-year survey

2.2 Program Description

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

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

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

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

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

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

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
Activity 2: Biotoxins Analyses Regional Training Course	8 days	<p>The regional training course, coordinated by MFRD, was held in the Toxins Laboratory in Veterinary Public Health Centre from 28 June to 7 July 2010.</p> <p>22 participants from 10 ASEAN SEAFDEC Member Countries participated in the training course. Dr. Suzuki Toshiyuki and Dr. Ryuichi Watanabe from the National Research Institute of Fisheries Science, Japan and Dr. Yasukatsu Oshima from Kitasato University were the lead trainers of the program. Two trainers each were also invited through Oasis Solutions Pte Ltd and Tropical Technology Centre, Japan, to conduct the sessions for rapid methods.</p> <p>The methods covered were:</p> <ol style="list-style-type: none"> 1) DSP and lipophilic toxins analysis using LC-MS/MS 2) PSP toxins analysis using HPLC 3) TTX toxins using LC-MS/MS

	<p>4) PSP ELISA rapid method 5) DSP rapid method. These methods were selected based on feedbacks from Member Countries on the methods they wish to build up capability in during the regional technical consultation in 2009.</p>
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3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Theme: Biotoxins analysis and monitoring.</p> <p>(2) Issues in the region at the beginning of the study: Consumption of a variety of shellfish and fish causes an increasing number of human intoxications around the world. Around 400 poisonous fish species exist and, by definition, the substances responsible for the toxicity of these species are biotoxins. Marine biotoxins represent a significant and expanding threat to human health in many parts of the world. The impact is visible in terms of human poisoning or even death following the consumption of contaminated shellfish or fish, as well as mass killings of fish and shellfish, and the death of marine animals and birds.</p> <p>The Codex Alimentarius Code of Practice for Fish and Fishery Products (CAC/RCP 52-2003) defined biotoxins as poisonous substances naturally present in fish and fishery products or accumulated by the animals feeding on toxin producing algae, or in water containing toxins produced by such organisms.</p> <p>Monitoring seafood for toxicity is essential to manage the risks. However, there are several limitations in monitoring for toxicity such as the variation in toxin content between individual shellfish, different detection and even extraction methods for the various toxins requiring a decision which toxins one is testing for, and the frequency of sampling to ensure that toxicity does not rise to dangerous levels in temporal or spatial gap between sampling times or locations. Furthermore, the growing harvest of non-traditional shellfish (such as moon snails, whelks, barnacles, etc.) may increase human health problems and management responsibilities. (FAO, 2004)</p> <p>In view of these, MFRD has proposed a project on biotoxins monitoring in ASEAN Countries to increase the attention in expanding and improving initiatives to monitor, detect and share information on marine biotoxins in order to reduce the public health risks associated with the consumption of contaminated shellfish and fish.</p>
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3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • To develop the methodologies on biotoxins analyses through human resource training. • To obtain an understanding of levels of biotoxins occurrences and incidences in fish and fishery products in ASEAN. • To establish protocols for harmonization • To encourage Member Countries without monitoring system to establish their own system • To establish a directory of reference of experts and responsible persons • To enhance analysis capability to a acceptable confidence level with the 1-year survey

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Regional Technical Consultation Meeting in Biotoxins Monitoring in ASEAN</p> <ul style="list-style-type: none"> • Deliberate on the scope of the project which includes the Biotoxins Monitoring Survey and the Technical Compilation. • Understand the status of biotoxins monitoring system in SEAFDEC Member Countries fisheries industry. • Identify the biotoxins analysis capabilities in Member Countries. • Assess the training requirements in biotoxins analysis.

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

3.2.4 Activities in the current program:

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

3.2.4 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> Hosted the Regional Technical Consultation Meeting in Biotoxins Monitoring in ASEAN from 26 to 28 August 2009. Invited Dr. Toshiyuki Suzuki from National Research Institute of Fisheries Science to be the expert for the project. Conducted the Regional Training Course on Biotoxins analysis in Singapore from 28 June to 7 July 2010 with 22 participants from 10 ASEAN-SEAFDEC Member Countries. Dr. Suzuki Toshiyuki and Dr. Ryuichi Watanabe from the National Research Institute of Fisheries Science, Japan and Dr. Yasukatsu Oshima from Kitasato University were invited as the lead trainers of the training course. Two trainers each were also invited through Oasis Solutions Pte Ltd and Tropical Technology Centre, Japan, to conduct the sessions for rapid methods. 	
(2) Main achievements till the end of 2010 (tentative)	
<ul style="list-style-type: none"> The RTC Meeting was successfully conducted held from 26 – 28 August 2009 in Novotel Clarke Quay Hotel in Singapore. The Meeting agreed that 1 Regional Training Course would be conducted in Singapore between June/July 2010 covering 4 methods in the 8-day course. The Meeting also agreed that participating Member Countries should collect and test baby clam/green mussel samples for PSP on a weekly basis for the 1-year survey in 2011. Five methods were covered in the training course: 1) DSP and lipophilic toxins analysis using LC-MS/MS, 2) PSP toxins analysis using HPLC, 3) TTX toxins using LC-MS/MS, 4) PSP ELISA rapid method and 5) DSP rapid method. 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)	
Expected outcomes	Achievement rate (%)
• Organize the Regional Technical Consultation in Biotoxins Monitoring	100%
• Organize and coordinate the Regional Training Courses.	100%
• Coordinate the Biotoxins Survey for ASEAN Member Countries	0%
• Collate the survey reports and publish the Technical Compilation of Biotoxins Monitoring in ASEAN	0%
• Organize the End-of-Project Meeting	0%

3.2.6 Evaluation of Program activities in 2010

One regional training course was held in 2010 for 22 participants. Participants commented that the training course would be useful for their work as most of the participants worked in regulatory laboratories. The PSP toxins analysis will be useful for laboratories that will need to set up their PSP analysis methods for the survey in 2011. Besides hands-on experience, participants also benefitted from the lectures by the invited experts which covered the setting up monitoring system, the nature and occurrences of biotoxins and the types of analytical methods available for biotoxins analysis.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 3: Biotoxins Survey	Jan-Dec 2011	<p>Participating countries would have to set-up the analytical method and identify suitable sampling sites after the regional training course. In the RTC in 2009, Member Countries have agreed that PSP is most crucial to human health and hence, would be the target analysis for the survey. The method of analysis would be up to individual countries, although they would be encouraged to use the methods learnt during the regional training course. All countries have identified that they would use green mussels (<i>Perna viridis</i>) as the samples, except for Vietnam and Indonesia, who would use baby clams (<i>Meritrix spp</i>).</p> <p>The sampling will be conducted weekly over a period of one year in 2011. The sample size would comprise of at least 10 individual shellfish with not less than 100g of flesh per sample at each sampling point. Member countries would also use their national budget to acquire adequate data for a comprehensive survey.</p> <p>These results will be submitted to MFRD on a quarterly basis and the results will be included in the final technical compilation at the end of the survey.</p>

4.2 Expected Outcomes in the Year 2011

MFRD will collate the reports from individual countries and publish the results as a technical compilation in first quarter of 2012.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Traceability Systems for Aquaculture Products in the ASEAN Region
Lead Department:	Marine Fisheries Research Department (MFRD)
Lead Country:	Singapore
Total Duration:	5 years (2010-2014)
Proposed Budget:	USD 178,100

1. INTRODUCTION

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

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

In view of these developments, MFRD has proposed a project on traceability for aquaculture products in the ASEAN region to provide a platform for the sharing of information and experiences among the ASEAN Member Countries on traceability systems to better enable the regional aquaculture industries to implement appropriate traceability systems in aquaculture products and to meet international traceability requirements in the network of aquaculture production, marketing, and trade.

2. PROGRAM

2.1 Objectives

- 1) To provide a platform for the sharing of information and experiences among ASEAN Member Countries on implementation of traceability systems in aquaculture products in the region
- 2) To promote the implementation of traceability systems for aquaculture products in the ASEAN region

2.2 Program Description

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

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

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
Activity 1: Regional Technical Consultation (RTC) in Traceability Systems for Aquaculture Products in the ASEAN Region.	3 days	The RTC was successfully conducted in Singapore from 12-14 October 2010. A total of 20 participants (2 from each ASEAN Member Country) and 1 observer from Indonesia attended the RTC. Three resource speakers were also invited, one from Thai DOF and two from commercial traceability solutions companies. The meeting deliberated and decided on all the project outputs, activities and time schedule. The meeting agreed to have the 1 st on-site training in Vietnam in 2011 for food fish traceability systems and the 2 nd on-site training to be conducted in Thailand for shrimp traceability systems in 2013, and the training scope for respective years.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

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

- To provide an overview of the status of implementation of traceability systems for aquaculture products in ASEAN Region.
- To impart technical know-how on development and implementation of traceability systems for aquaculture products through human resource training.
- To promote the development and implementation of traceability systems for aquaculture products especially in ASEAN Member Countries which have yet to do so.

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Regional Technical Consultation in Traceability Systems for Aquaculture Products in ASEAN Region</p> <ul style="list-style-type: none"> • Deliberate on the scope of the project which covers technical compilation on traceability systems for aquaculture products in the ASEAN region and on-site training on traceability systems for aquaculture products. • Identify regional expertise with knowledge and experience in developing and implementing traceability systems for aquaculture products to conduct on-site training and to develop the relevant training materials. • Identify suitable sites for the on-site training on traceability systems for aquaculture products (fish farm and shrimp farm) with suitable co-operants.
<p>Step 2: Regional On-site Training Workshops on Traceability Systems for Aquaculture Products in ASEAN Region</p> <ul style="list-style-type: none"> • To build up capacity in ASEAN Member Countries for knowledge in traceability systems for aquaculture products • To facilitate implementation of traceability systems for aquaculture products for interested parties from ASEAN Member Countries
<p>Step 3: Mid-Term Project Review Meeting</p> <ul style="list-style-type: none"> • To review the progress of the project and activities conducted. • To provide an update on the implementation status of traceability systems for aquaculture products in the ASEAN Region. • To discuss on the future project activities.
<p>Step 4: Documentation and Publication of Technical Compilation</p> <ul style="list-style-type: none"> • To compile technical information on traceability systems for aquaculture products in ASEAN region. The technical information shall cover subjects such as; implementation know-how, difficulties faced and benefits of traceability systems for aquaculture products. The inputs shall preferably be from stakeholders that offer the above on-site training.
<p>Step 5: End-of-Project Workshop</p> <ul style="list-style-type: none"> • To disseminate the Technical Compilation on traceability systems for aquaculture products in ASEAN region • To discuss the challenges faced during the project implementation and discuss possible future projects.

3.2.4 Activities in the current program:

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

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> Hosted the Regional Technical Consultation on Traceability Systems on Aquaculture Products in the ASEAN Region from 12- 14 October 2010. Invited Ms. Niracha Wongchinda (Senior Expert in Fishery Products) to be resource speaker for the RTC. IBM and GS1 Singapore were also invited to provide technical talks on traceability systems to participants. 	
(2) Main achievements till the end of 2010 (tentative)	
<ul style="list-style-type: none"> The RTC Meeting was successfully conducted held from 12 – 14 October in Singapore. The meeting decided on all the project activities and time schedule. The meeting agreed on the project output. The meeting agreed to conduct the 1st on-site workshop on traceability systems for aquaculture fish in Vietnam in 2011 and the 2nd on-site workshop on traceability systems for aquaculture shrimp in Thailand in 2013. 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)	
Expected outcome	Achievement rate (%)
Regional Technical Consultation in Traceability Systems for Aquaculture Products in ASEAN Region	100%
1 st and 2 nd Regional On-site Training Workshops on Traceability Systems for Aquaculture Products in ASEAN Region	0%
Mid-Term Project Review Meeting	0%
Documentation and Publication of Technical Compilation	0%
End-of-Project Workshop	0%

3.2.6 Evaluation of Program activities in 2010

The RTC on traceability systems for aquaculture products in the ASEAN region was successfully conducted from 12- 14 October. 20 participants from ten ASEAN Member Countries and 1 observer from Indonesia attended the RTC. The country presentations were informative and useful as it provided the participants with a better understanding of the features and implementation of traceability systems (or lack of it) in each ASEAN Member Country. The resource speakers presented the various traceability solutions available for implementation of traceability systems in the food supply chains. The meeting was also able to decide and agree on all the project outputs, activities and time schedule, and the training scope for Year 2011 and 2013. The Key Project Leader (KPL) in each ASEAN Member Country has also been appointed except for Lao PDR and Singapore.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 2: 1 st on-site training for food fish traceability systems in Vietnam	3 days in 3 rd quarter of 2011	The Vietnam KPL will assist MFRD to organize the training using regional expertise.

4.2 Expected Outcomes in the Year 2011

The 1st on-site training is expected to be conducted in Vietnam for the food fish traceability systems in the 3rd quarter of 2011.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Utilization of Freshwater Fish for Value-Added Products
Lead Department:	Marine Fisheries Research Department (MFRD)
Lead Country:	Singapore
Total Duration:	3 years (2011-2013)
Proposed Budget:	USD 84,660

1. INTRODUCTION

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

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

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

The project is proposed based on the following resolution and plan of action as endorsed at the ASEAN-SEAFDEC Millennium Conference of 2001:

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 optimize 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

The objectives of the project are:

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

2.2 Program Description

The Post-Harvest technology Division (PHTD) of the Agri-Food and Veterinary Authority (AVA) as the Collaborating Center for MFRD programs will be responsible for the project and will manage and coordinate all project activities.

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

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

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

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
NA – New project to start in 2011		

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Theme: Utilization of freshwater fish species.</p> <p>(2) Issues in the region at the beginning of the study: Freshwater fish is an important fisheries resource in many ASEAN Member Countries where it serves as a major source of animal protein especially for the marginalized and poorer segments of the population thereby contributing to food security in these countries. Freshwater fish is also an important source of raw materials for processing into a variety of traditional fish products in the ASEAN Member Countries.</p> <p>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.</p> <p>With Lao PDR, Cambodia, Myanmar and Vietnam becoming members of SEAFDEC, freshwater fish utilization is becoming an important area to study as these Member Countries have significant freshwater fisheries.</p>
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3.2.2 Expected final goals of the program:

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| <ul style="list-style-type: none"> • To utilize selected freshwater fish species for the development of value-added products in participating countries. • To assist in upgrading the processing and packaging technology for freshwater fish products |
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3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Project Inception and Planning Meeting</p> <ul style="list-style-type: none"> • To discuss and plan for all project activities and time schedules. • To identify the freshwater fish species to be utilized and the types of value-added products to be developed. • To provide a better overview and understanding of the freshwater fisheries resources as well as the traditional freshwater fish products in the participating countries. • To identify the key project leader in each country and commercial cooperants, if any, for the project.
<p>Step 2: Regional Training Course in Processing of Value Added Products</p> <ul style="list-style-type: none"> • To provide project participants with the knowledge and skills in processing, packaging and product development of freshwater fish products using simple, inexpensive equipment and technology suitable for the village level and small to medium-sized industry. • Good manufacturing and handling practices to ensure product safety and quality will also be emphasized in the course.
<p>Step 3: Product development and processing trials</p> <ul style="list-style-type: none"> • Each participating country to conduct product development and processing (including packaging) trials to develop 2 – 3 value added products using selected freshwater fish species. • Shelf-life studies on the products should also be conducted
<p>Step 4: Mid-term Evaluation and Progress Meeting</p> <ul style="list-style-type: none"> • To discuss and evaluate the progress of the project • To plan for the subsequent activities <i>i.e.</i> the preparation and publication of the processing handbook and the End-of-Project Seminar.
<p>Step 5: Preparation and Publication of the Processing Handbook</p> <ul style="list-style-type: none"> • A handbook on the processing of the value-added products developed by each of the country using the freshwater fish species will be prepared and published. Five hundred copies of the handbook will be printed.
<p>Step 6: End-of-Project Seminar</p> <ul style="list-style-type: none"> • To share the results of the project with the other ASEAN Member Countries. • To disseminate the handbook on the processing of the value-added products. • To discuss the challenges faced during the project implementation and discuss possible future projects.

3.2.4 Activities in the current program:

(1) Current position of the project: NA
(2) Project duration: 2011 -2013
<p>(3) Main activities</p> <ul style="list-style-type: none"> • Project Inception and Planning Meeting • Regional Training Course in Processing of Value Added Products • Product development and processing trials • Mid-term Evaluation and Progress Meeting • Preparation and Publication of the Processing Handbook • End-of-Project Seminar

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program NA – New project to start in 2011
(2) Main achievements till the end of 2010 (tentative) NA – New project to start in 2011

(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)	
Expected outcome	Achievement rate (%)
NA – New project to start in 2011	

3.2.6 Evaluation of Program activities in 2010

(no activities implemented in 2010)

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1: Project Inception and Planning Meeting	2 days	A 2-day Project Inception and Planning Meeting will be held in Singapore in the first quarter of 2011 to discuss and plan for all project activities, identify the freshwater fish species to be utilized and the types of value-added products to be developed. Two participants each from Lao PDR, Myanmar, Vietnam and Indonesia who are involved in the freshwater fisheries industry will be invited to attend; one of whom should be from the private sector. The meeting will provide an opportunity for a better overview and understanding of the freshwater fisheries resources as well as the traditional freshwater fish products in Lao PDR, Myanmar, Vietnam and Indonesia. The meeting will also identify the key project leader in each country and commercial cooperates, if any, for the project.
Activity 2: Regional Training Course in Processing of Value Added Products	5 days	A Regional Training Course in processing and packaging of value added products using freshwater fish will be organized and conducted in Singapore in the third quarter of 2011. Two participants from each country will be invited to attend, one of whom should be from the private sector. The training course will include lectures and hands-on practicals on the processing of value added products such as fish sweetmeat, fish otah, fish sausage, fish crackers, etc using simple, inexpensive equipment and technology suitable for the village level and small to medium-sized industry. Good manufacturing and handling practices to ensure product safety and quality will also be emphasized in the course.

4.2 Expected Outcomes in the Year 2011

MFRD will conduct the 2-day Project Inception and Planning Meeting in Singapore in the first quarter of 2011 to discuss and plan for all project activities and time schedules, identify the freshwater fish species to be utilized and the types of value-added products to be developed by the participating countries. In the third quarter of 2011, MFRD will organize and conduct the 5-day Regional Training Course on Processing of Value Added Products using freshwater fish to equip the project participants with the knowledge and skills to develop value added products using simple, inexpensive equipment and technology suitable for the village level and small to medium-sized industry.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Promotion of Sustainable and Region-Oriented Aquaculture Practices
Lead Department:	Aquaculture Department
Lead Country:	The Philippines
Total Duration:	2010-2014

1. INTRODUCTION

Aquaculture is undoubtedly one of the practical ways for addressing the issues of food security and widespread poverty in the rural areas of the ASEAN region. However, aquaculture production in the region needs to be increased in a sustainable and environment-friendly manner as declared by the Ministers of the ASEAN-SEAFDEC Member Countries responsible for fisheries (the Bangkok Declaration 2001). In practice, broodstock and fry needed for the aquaculture of middle- and high-value commodities, which are major aquaculture products being exported to developed countries, depend mostly on coastal wild resources. This practice has seriously affected the sustainability of coastal resources, and the needs to protect the coastal resources have increasingly elevated these days. In response to the said necessity, SEAFDEC Aquaculture Department, in collaboration with Member Countries, has implemented the project entitled “Development of Technologies and Human Capacity Building for Sustainable Aquaculture” as part of the Program on the Promotion of Sustainable Aquaculture in the ASEAN Region under Japanese Trust Fund 4 (TF-4) during 2005-2009.

In the TF-4, we have been focusing on “domestication” to attain the sustainable aquaculture as well as to mitigate the pressure on coastal resources by providing stable and reliable supply of quality seeds from domesticated broodstock. However, to facilitate not only the mitigation efficacy but also availability of the aquaculture products, development of technology for selective breeding also needs to be established as well as the continuing effort toward the improved domestication. Selective breeding is also expected to enable small-scale farmers to practice aquaculture with lower investment through introduction of new and improved strains and genetic improvement of commercially important aquaculture species, which is essential to the promotion of sustainable aquaculture in the region. In the present project TF-5 beginning from 2010, therefore, selective breeding of commercially important species was targeted as one of the goals.

Most aquaculture practices for commercially-important species consist of “Aquaculture with Feeding”. Aquaculture feeds are highly dependent on fish by-catch under unregulated fisheries. This has also seriously affected the sustainability of coastal resources. Moreover, improper feeding regimes using low quality feeds have led to environmental pollution and degradation. Development of efficient/low-pollution diets and optimum feeding regimes will minimize the negative impacts of aquaculture feeds on the environment. Furthermore, this will optimize growth, survival, reproductive performance and production of healthy animals, and consequently contribute to the supply of safe aquaculture products to the region. Thus, the development of environment-friendly feeds is crucial to the promotion of sustainable aquaculture in the region.

Intensive aquaculture systems have been adopted on a large scale to increase production. As a result, a number of serious problems have emerged, including environmental degradation and disease outbreaks, which continue to plague the aquaculture industry in the region. Aside from the progress in the studies on diseases and pathogens, a wide spectrum of technological views is needed to solve these problems. A stressful environment has been proven to be a crucial risk factor that can lead to disease outbreaks in the TF4 activity. Based on that, one of the best ways to prevent disease outbreaks is to design farm management practices that will minimize stressors in the culture system.

Because institutional investment on aquaculture development has mainly centered on “research” and “development”, importance of the sustainable and responsible aquaculture has not been adequately disseminated in rural communities yet. The successful adoption of aquaculture technologies in the ASEAN region may pave the way to livelihood improvement and poverty alleviation of rural communities. However, there is a lack of human resource to mediate the transfer of knowledge and practices of sustainable aquaculture technologies between researchers and fisherfolk. There is also a lack of practical ordinances or policies on responsible aquaculture practices in the level of the local government units. These may constrain the extension and adoption of sustainable aquaculture technologies. To achieve sustainability in the region, a holistic approach that includes seminar / lectures / training should be implemented.

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

In summary, TF-5 practically aims to contribute not only to the promotion of sustainable aquaculture but also to the stable supply of safe aquaculture products through the region-oriented and environment-friendly manner.

2. PROGRAM

2.1 Objectives

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

2.2 Program Description

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

The present project involves genetic selection in mud crab *Scylla serrata*, tiger shrimp *Penaeus monodon*, giant freshwater prawn *Macrobrachium rosenbergii* based on set criteria aimed at producing subsequent generations that exhibit faster growth, better reproductive performance and disease resistance. It also includes the development of technology for the mass production of carrageenophytes *Kappaphycus spp.* plantlets with improved traits through biotechnology. In all these commodities, genetic monitoring to maintain high genetic variability and identification of possible genetic markers for the selected beneficial traits will be applied. The present project also includes the development of hatchery technology of emerging species with a pressing need to develop breeding, seed production and culture techniques.

Efficient and low pollution feeds for various stages of commercially important aquaculture species such as milkfish, grouper, mud crab, black tiger shrimp and freshwater prawn using feed ingredients available in the region as replacement for imported fish meal will be developed. Likewise, a survey of the availability and quality assessment of feed resources in the Philippines and selected developing countries in Southeast Asia (Cambodia, Laos and Myanmar) will be conducted. Guidelines on proper feeding management to obtain optimal feed performance and to reduce the negative impacts of improper feeding on the environment will be done.

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

The project will analyze the socio-economic impact of the transfer and adoption of aquaculture technologies in selected sites. The project will also identify the policies, institutional, and socioeconomic factors that help or hinder the adoption of the technology.

The results of the various studies in the project will be disseminated through the conduct of meetings, training courses, demonstration farm, lecture/seminar especially in the lesser developed ASEAN Member Countries and publication of manuals and/or textbooks.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity/Sub-activity Title	Duration	Remarks
1. Genetic improvement of commercially important species and development of hatchery technology		
1.1 Selective breeding of mud crabs <i>Scylla serrata</i>	All year round	- The quality of newly hatched larvae of each family was evaluated using starvation and formalin (0, 10, 20, 30 and 40 ppm) stress tests. Results were compared with the performance of larvae in the production runs for validation. - Crabs were exposed to WSSV by feeding them shrimp flesh positive of WSSV as a challenge test.
1.2 Selective breeding of black tiger shrimp <i>Penaeus monodon</i>	All year round	- Broodstock from Mabini (Bohol), Tagabuli Bay (Digos, Davao del Sur), Panabo City (Panabo, Davao del Norte), and Antique were screened for WSSV, IHHNV, IMNV, and TSV. - Additional broodstock from Mabini, Bohol and Digos, Davao have been collected. All broodstock were sampled for virus screening. All came out negative for WSSV and IHHNV.
1.3 Genetic improvement of giant freshwater prawns <i>Macrobrachium rosenbergii</i>	All year round	- Monthly monitoring to date showed no particular trend in terms of the best stock (Old Calumpit and New Calumpit) of freshwater prawns in terms of reproductive efficiency parameters. - Final data analysis shall be made after a year of monitoring hence results as to the best stock will be completely available and conclusive by then. - Growth experiment showed growth and survival were best for fed OC which reached an average body weight gain of 7.73g at 77.5% survival rate after three months of rearing.

1.4 Mass production of plantlets with improved traits	All year round	-Optimization of culture conditions of <i>Kappaphycus</i> in tanks was done. Effects of illumination intensity, aeration, stocking density, temperature, ploidy, and fertilizer were determined.
1.5 Development of hatchery technology of emerging species	All year round	-Experiments to determine optimum male:female ratio for spawning, optimum hormone (HCG) concentration to induce spawning were performed in pompano -Experiments to determine efficacy of LHRH and HCG to induce spawning were performed in Kikero.
2. Development of environment-friendly feeds using regionally available ingredients		
2.1 Development of efficient and low pollution feeds for grow-out and broodstock	Oct.-Dec.	Formulation and preparation of low-pollution broodstock diets using locally produced inexpensive ingredients for the giant freshwater prawn in progress. In addition, materials needed for the feeding trials are being prepared. The experiment will investigate the effect of substituting fish meal with cowpea meal on the growth and reproductive performance (fecundity and hatching rates) of giant freshwater prawn broodstock.
2.2 Establishment of guidelines for optimum feeding management through survey of availability and quality assessment of feed resources	All year round	-The samples obtained in Mindanao of plant origin were proved to be good sources of carbohydrates since levels of this nutrient in samples collected ranged from 60% to 92% -Crude protein levels of fish meal samples obtained in the Visayas area including a sample from Palawan ranged from 46% to 67% -The crude ash in the said samples are high (22% to 43%) and with low levels of crude fat (2.5% to 4.3%).
3. Establishment of managing technology of aquaculture environment	All year round	-Monthly sampling in 10 farms with different mangrove to pond area ratio and using or not using the greenwater culture system has been concluded. -Eight farmers in Ca Mau Province in Vietnam that are into aquasilviculture were interviewed.
4. Socioeconomic assessment and impact analysis of transfer and adoption of sustainable aquaculture technologies	All year round	-In milkfish cage culture, lack of capital and small coastal areas are some of the limiting factors for non-adoption of the technology of the member-beneficiaries. -Composting of water lettuce was suggested as an option to clean up the river, but it requires manpower and funds to operationalize it.
5. Technology extension and demonstration		
5.1 Giant freshwater prawn production training program	Jan.-Feb. 2011	-The schedule was moved from December 2010 to January 2011, because of damages suffered from a typhoon. -The training hopes to provide the participants with technical knowledge and skills on the breeding and propagation of the giant freshwater prawn <i>Macrobrachium rosenbergii</i> to (1) enable them to start a freshwater hatchery of the species mentioned, (2) update their knowledge in recent developments in freshwater prawn breeding and seedstock production and (3) learn methods in freshwater prawn farming in different types of culture systems (cages or ponds).
5.2 Regional dissemination of mud crab farming program		No Activity in 2010
5.3 Regional dissemination black tiger shrimp farming program		No Activity in 2010

5.4 Marine fish hatchery training program	May-July	-The participants were able to undertake actual larval rearing of different marine species which included milkfish, grouper, rabbitfish, and snapper. -Most of the participants expressed satisfaction with the way the training course was organized and implemented.
5.5 Abalone hatchery training program	July	-The training course provided participants with technical knowledge and skills on the hatchery and grow-out of abalone from broodstock management, egg collection/incubation, veliger collection, stocking in settlement tank, identification of different abalone stages and culture of natural food, to larval rearing and cage grow-out
5.6 Seaweed farming training program		No Activity in 2010
5.7 On-line course on nutrition and on-site feed preparation training program	April Nov or Dec	-A 2-day workshop attended by Fish Nutrition Specialists was held 16-17 April 2010. Revision of CD and final assignments of specialists were discussed. Revision of Nutrition textbook will also be done. -Revision of CD is in progress. The AquaNutrition on-line will be offered starting March 2011 and every other year thereafter. -Fish nutrition on-site training program is scheduled to offer the fundamental and essential information on fish nutrition, feed formulation and feed management.
5.8 Rural aquaculture program	Nov.	-The training course aims to enhance the knowledge and skills of government extension officers on freshwater aquaculture systems from broodstock development to seed production, nursery, and grow-out to enable them to effectively transfer and disseminate the freshwater aquaculture technologies in remote rural areas of their respective countries. -The course will be conducted on November 8-17, 2010. -Participants will be from all Member Countries except Brunei & Singapore. -The venue will be the AQD Tigbauan Main Station. -The field trip for the "learning-by-doing" community immersion and consultation will be in Dumarao, Capiz which is the site of the on-going Tilapia Cage Culture Livelihood under the Institutional Capacity Development for Sustainable Aquaculture (ICDSA) Project.
6. Publication		No Activity in 2010
7. Annual progress meeting and international workshop		
7.1 Annual progress meeting	Jan. 2011	-Annual meeting will be held to review the project achievement. Study leaders and the project leader will attend the meeting. Evaluators will be invited to join the meeting to review/evaluate the project achievements.
7.2 International workshop		No Activity in 2010
8.Coordination by the project leader	All year round	-The present project activities were confirmed and their further progresses were encouraged through interviews with study leaders. -Semi-annual meeting was held on July to confirm the progress of respective activities and sub-activities.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

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

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • To ensure reliable and sustainable production through genetic improvement of commercially important species and to establish reliable breeding and mass seed production techniques for new species for aquaculture • To develop environment-friendly feeds for marine fish and crustaceans from regionally available ingredients • To establish managing technology of aquaculture environment • To assess and analyze impact of transfer and adoption of sustainable aquaculture technologies for fisherfolk in the region • To disseminate and demonstrate the aquaculture technology

3.2.3 “Steps” toward achieving final goals:

Step 1: <ul style="list-style-type: none"> • Production of various generations and families of commercially important species, evaluation of the impact of domestication selection on hatchery stocks, and collection of juveniles or adults for broodstock development of emerging species • Information survey, formulation and preparation of cost-effective and low pollution feeds • Gathering information on farm management techniques and best management practices • Assessment of the socioeconomic impact of the technology transfer and adoption • Implementation of training courses, demonstration farm and lecture/seminar
Step 2: <ul style="list-style-type: none"> • Selective breeding and genetic monitoring, formulation and assessment of different broodstock management protocols, and induction of spawning, seed production and grow-out trials of emerging species • Controlled feeding experiments and incorporate findings in test diets in the laboratory • Analysis and design of a management scheme and verification of the management scheme • Examination of property rights regimes impinging on technology adoption and adaptation • Transfer of technical through capacity building to Member Countries
Step 3: <ul style="list-style-type: none"> • Monitoring, assessment and refinement of heritability of selected traits, and promotion of hatchery, nursery and grow-out for emerging species • Feeding experiments in ponds, net cages or broodstock tanks • Refinement of scheme through farm trials and dissemination of knowledge and technology • Recommendation of policies for enhancing the adoption of sustainable aquaculture technologies suitable for developing countries in the region • Workshop/seminar

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1
(2) Program duration: 2010-2014

(3) Main activities

- Genetic improvement of commercially important species and development of hatchery technology
- Development of environment-friendly feeds using regionally available ingredients
- Establishment of managing technology of aquaculture environment
- Socioeconomic assessment and impact analysis of transfer and adoption of sustainable aquaculture technologies
- Technology extension and demonstration

3.2.6 Progress and achievements of the current program:

(1) Main activities conducted in the current program

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

(2) Main achievements till the end of 2010 (tentative)

- An evaluation method for the quality of the mud crab larvae is being established.
- The first batch of F1 postlarvae has been produced by a female from Bohol and a male *Penaeus monodon* from Antique.
- Valuable data showing genetic differences in the breeding and growth responses of two *Macrobrachium rosenbergii* stocks (NC and OC) under specific environments and feeding schemes have been obtained and will be subsequently used in the formulation of effective prawn broodstock management and genetic improvement schemes.
- Culture conditions of *kappaphycus* in the laboratory and tanks were optimized.
- Higher survival rate of Kikero larvae reared in lower salinities (15 and 20 ppt) was obtained.
- A survey of feed ingredients for aqua feed use has been done in Mindanao and most part of the Northern and Central Philippines.
- It was demonstrated that the presence of mangroves in the receiving environment or inside the culture pond could not always prevent WSSV infection in *P. monodon*.
- Giant water lettuce that excessively proliferated and caused retardation of growth in tilapia at Dumarao are being tested as feed for earthworms to produce vermicasting organic fertilizers.

(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)

Expected outcomes	Achievement rate (%)
<ul style="list-style-type: none"> • To ensure reliable and sustainable production through genetic improvement of commercially important species and to establish reliable breeding and mass seed production techniques for new species for aquaculture 	15%
<ul style="list-style-type: none"> • To develop environment-friendly feeds for marine fish and crustaceans from regionally available ingredients 	10%
<ul style="list-style-type: none"> • To establish managing technology of aquaculture environment 	20%
<ul style="list-style-type: none"> • To assess and analyze impact of transfer and adoption of sustainable aquaculture technologies for fisherfolk in the region 	20%
<ul style="list-style-type: none"> • To disseminate and demonstrate the aquaculture technology 	10%

3.2.6 Evaluation of Program activities in 2010

The directions of the planned activity/sub-activity and the tentative achievement so far are highly evaluated since these are based on the scientific bases of former results including those obtained through the activities of TF-4, not to mention the fact that these are well in line with the pressing issues faced in the region. The progress of the program activities, however, was judged to be delayed a little bit than expected as a whole, although some activities showed good progress. The major reasons of delay could be ascribed to unfavorable environmental conditions, such as abnormally high water temperature and damages caused by a natural calamity (typhoon). Considering the rigid and robust data in this year irrespective of different strides among activities/sub-activities, better progress is expected in 2011.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Activity / Sub-activity Title	Duration	Remarks
1. Genetic improvement of commercially important species and development of hatchery technology		
1.1 Selective breeding of mud crabs <i>Scylla serrata</i>	All year round	Additional broodstock will be obtained to increase the base population while maintaining subsequent generations. To determine the quality of the larvae from each family, experiments on stress tests (starvation and formalin) and challenge test (WSSV) will be done. After screening each family, reciprocal matings will be done using subadult males and females in grow-out ponds. The selection will be initiated based on set criteria aimed at producing subsequent generations that exhibit faster growth and better reproductive performance.
1.2 Selective breeding of black tiger shrimp <i>Penaeus monodon</i>	All year round	The first generation of <i>P. monodon</i> , produced from broodstock collected from two to three sites known to have stocks with high genetic variability, will be grown to broodstock size. Selection for faster-growing animals will be done at the late postlarval stage, during the grow-out and again at the pre-broodstock phase. Survival and growth will be regularly monitored so that these can be compared to those obtained in later generations. Disease resistance will also be measured through challenge tests, using white spot syndrome virus, at the late postlarval stage.
1.3 Genetic improvement of giant freshwater prawns <i>Macrobrachium rosenbergii</i>	All year round	Two <i>M. rosenbergii</i> broodstock lines -- OC (SEAFDEC/AQD-BFS hatchery-domesticated breeders) and NC (newly collected wild spawners) will be compared, using two broodstock management schemes. These are: a) reciprocal mating where males from line one (OC ₆) will be paired off with females from the other line (NC ₂) and vice versa; and b) frequent broodstock replenishment where females from within the same line are paired off and replaced at specified intervals (no replacement, female replacement every 3 months, every 6 months and every 9 months) with unreplaced males. The efficacy of these methods shall be evaluated using reproductive and growth performance parameters.
1.4 Mass production of plantlets with improved traits	All year round	Optimization of culture conditions of <i>Kappaphycus</i> in tanks and the outdoor will be done. Mature <i>Kappaphycus</i> and <i>Euclidean</i> will be collected from the wild for spore shedding. Spores from different species will be grown in the laboratory collected and grown in the laboratory. Sporelings will be grown in the laboratory and tanks. Growth performance and carrageenan quality of the seaweeds will be determined. Spore (from different varieties) fusion trials will be conducted using

		fusagen, an attempt to produce hybrids.
1.5 Development of hatchery technology of emerging species	All year round	Monthly monitoring of gonadal maturation in Kikiro and Pompano will be continued to determine the best period for induced spawning. The study will conduct experiments to determine the optimum temperature, salinity, feeding preferences and light intensity for larval rearing.
2. Development of environment-friendly feeds using regionally available ingredients		
2.1 Development of efficient and low pollution feeds for grow-out and broodstock	All year round	The development of low-cost, low-pollution and nutritionally adequate diets is inevitable for the practice of responsible aquaculture in the region. Along this purpose, feeding experiments focusing on locally available inexpensive ingredients will be continued in 2011 using giant freshwater prawn, which is considered as one of the best model crustacean species in the region. New formulations of practical diet for this species as well as knowledge and methodology obtained in the freshwater prawn experiments will be utilized in the forthcoming studies on other marine fish and crustaceans as well, if the budget for the year will allow.
2.2 Establishment of guidelines for optimum feeding management through survey of availability and quality assessment of feed resources	All year round	In 2011 a survey of feed ingredients and materials with potential as aquafeed ingredient will be done in Cambodia and Laos. The quality of samples will be assessed and the nutrient levels will be determined by proximate nutrient analysis to be done at the laboratory in SEAFDEC. Samples with high levels of crude fat will be further analyzed for fatty acid profile.
3. Establishment of managing technology of aquaculture environment	All year round	Information gathering on the different farm management techniques started in 2010 will be continued. Farm visits, interviews, questionnaire type of survey, discussion with stakeholders will be done to gather information on the different farm management techniques employed and problems encountered by commercial shrimp farmers. Shrimp farmers in the the top 6 shrimp producing provinces of the Philippines (Pampanga, Lanao del Norte, Zamboanga Sibugay, Zamboanga del Sur, Bataan, Bohol) not visited in 2010 will be visited and interviewed. Farmers in other Southeast Asian countries using environment friendly shrimp culture will also be interviewed if budget permits.
4. Socioeconomic assessment and impact analysis of transfer and adoption of sustainable aquaculture technologies	All year round	Reconnaissance survey and key informants interview were done in 2010. In 2011, household surveys shall be conducted in two sites (marine and freshwater fisheries). An equal number of operators and non-operators shall be interviewed in each site to analyze the factors that contribute or impede the acceptability and adoption of technology. The differences in knowledge of and attitudes among community members (operators and non-operators) and between locations (marine vs freshwater) towards technology adoption shall be examined.
5. Technology extension and demonstration		
5.1 Giant freshwater prawn production training program		No Activity in 2011
5.2 Regional dissemination of mud crab farming program	ND	This sub-activity will disseminate the farming program of mud crabs, <i>Scylla</i> species, of which widespread interest is increasing due to the high price both in domestic and international market.
5.3 Regional dissemination black tiger shrimp		No Activity in 2011

farming program		
5.4 Marine fish hatchery training program	ND	Aquaculture of high-value marine fish continues to develop rapidly in Southeast Asia. This 5-week training program will extend and demonstrate the broodstock and spawning techniques, larval and nursery rearing techniques, nutrition and health management in grouper, seabass, snapper <i>etc.</i>
5.5 Abalone hatchery training program	ND	The donkey's ear abalone <i>Haliotis asinina</i> has been the focus of research and development efforts at SEAFDEC/AQD since 1994 as it is the fastest-growing species and commands high market value. The sub-activity 5.5 will offer the fundamental and essential hatchery and grow-out technology of tropical abalone.
5.6 Seaweed farming training program		No Activity in 2011
5.7 On-line course on nutrition and on-site feed preparation training program	ND	A balanced diet for fish is important in ensuring fast growing, healthy, and disease-free fish and shrimps as well as minimizing environmental impacts of feeding. The sub-activity 5.7 will offer the essential and fundamental information on fish nutrition, feed formulation, feed management and economics of feeding. The learner is expected to formulate and prepare diets for aquaculture, apply proper feeding management and practices, and develop cost-efficient diets for cultured species.
5.8 Rural aquaculture program	ND	To promote and disseminate appropriate community-based freshwater aquaculture technology for remote rural areas of Southeast Asia, SEAFDEC/AQD under this sub-activity will conduct a Training of Trainers on Community-based Freshwater Aquaculture for fisheries extension officers responsible for development/implementation of technology transfer of freshwater aquaculture in support of rural development for poverty alleviation and sustainable livelihood.
6. Publication		Manuals, posters, pamphlets and flyer describing the sustainable aquaculture will be published and distributed.
7. Annual progress meeting and international workshop		
7.1 Annual progress meeting	ND	Annual meeting will be held to review the project achievement. Study leaders and the project leader will attend the meeting. Evaluators will be invited to join the meeting to review/evaluate the project achievements.
7.2 International workshop		No Activity in 2011
8. Coordination by the project leader	All year round	The present project activities will be confirmed and their further progresses will be encouraged through interviews with study leaders. Semi-annual meeting will be held on July to confirm the progress of respective activities and sub-activities. Project achievements will be summarized at the end of year. Annual progress report will be prepared.

4.2 Expected Outcomes in the Year 2011

The envisaged outcomes for the second year are to: 1) produce various generations and families of commercially important species, to evaluate the impact of domestication selection on hatchery stocks, and to collect juveniles or adults for broodstock development of emerging species, 2) survey information, to formulate and prepare cost-effective and low pollution feeds, 3) gather information on farm management techniques and best management practices, 4) assess the socioeconomic impact of the technology transfer and adoption, and 5) implement training courses, demonstration farm and lecture/seminar for the ASEAN member country in order to promote sustainable and region-oriented aquaculture practices.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Resource Enhancement of Internationally Threatened and Over-Exploited Species in Southeast Asia through Stock
Lead Department:	Aquaculture Department
Lead Country:	The Philippines
Total Duration:	2010-2014

1. INTRODUCTION

Resource conservation of diminishing populations of the CITES-listed threatened and endangered species as well as the high value, commercially important but over-exploited species has been a pressing issue in the Southeast Asian region. Replenishing depleted resources may be done by regulating fishing effort, restoring degraded nursery and spawning habitats and/or through stock enhancement. The Southeast Asian Fisheries Development Center (SEAFDEC) is an intergovernmental organization established to promote sustainable fisheries development in the region. To address the issue on resource conservation, especially of the threatened or endangered species, SEAFDEC has implemented the project on “Stock Enhancement of Threatened Species of International Concern” under the financial support of the Government of Japan Trust Fund 4 (TF-4) since 2005. Under this project, SEAFDEC Aquaculture Department (AQD) has been conducting studies on basic methodologies of seed production and/or release strategies for seahorse, Napoleon wrasse, sea cucumber, giant clam, donkey’s ear abalone and angelwing clams that are CITES-listed and/or over-exploited species.

Although stock enhancement is an effective approach that can sustain or enhance depleted resources, basic technologies and information on stock enhancement are still lacking in the Southeast Asian countries. Based on the progress of the former Program (TF-4) and the up-to-date concept and policies of stock enhancement, the proposed project aims at replenishing resources of internationally threatened and over-exploited species in Southeast Asia through environment-friendly stock enhancement. In addition, the project will promote to transfer basic technologies and information on stock enhancement to Member Countries through training courses. The program will contribute both to the world-wide concern on the resource conservation of the said species and to the sustainable utilization and exploitation of natural coastal resources in the region through environment-friendly manners.

2. PROGRAM

2.1 Objectives

The objectives of the Program are to: 1) establish resource enhancement strategies of CITES species and regionally over-exploited species; 2) establish stable seed production technologies appropriate for release with genetic consideration; 3) develop stock enhancement strategies including site assessment, stock release, monitoring and recapture, taking into consideration impact of release on wild population and other species; 4) develop a sustainable utilization and exploitation of natural coastal resources through stock enhancement; 5) establish guidelines and demonstration sites, and to conduct seminars/lectures on stock enhancement practices in Southeast Asia; 6) assess and evaluate the socioeconomic impacts of stock enhancement to fishery stakeholders and management strategies suitable for adoption in fishing communities; and 7) transfer basic technologies and information on stock enhancement to Member Countries.

2.2 Program Description

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

The present project will try to restore stock levels of some species listed in CITES (seahorse *Hippocampus* spp. and Napoleon wrasse *Cheilinus undulatus*) and those heavily-exploited but economically-important species in Southeast Asia (sea cucumber *Holothuria scabra*, donkey's ear abalone *Haliotis asinina*, and mud crabs *Scylla* spp.) through stock enhancement program.

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

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

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

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

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

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity / Sub-activity Title	Duration	Remarks
1. Stock enhancement of internationally threatened species		
1.1 Stock enhancement of seahorses	All year round	<ul style="list-style-type: none"> - Optimal food organisms ensuring reproductive performance and juvenile growth and survival were examined in order to refine mass-production technology for seahorse juveniles - Seahorse, <i>H. comes</i> reproductive performance bettered with mysid due to shorter parturition intervals (13 d) and larger brood size (145-180) per parturition than with artemia alone or in combination with artemia and acetes. - Growth and survival of 1 to 6-mo old seahorse increased with mysid or mysid+artemia than artemia alone. - Survival was also prominent with mysids than others. - Rapid assessment of restocking sites identified Danjungan

		Island, Cauayan and Molocaboc Island, Sagay City, Negros Occidental as the most potential sites.
1.2 Stock enhancement of Napoleon wrasse	All year round	<ul style="list-style-type: none"> - Monitor spawning and larval development of wrasse - Napoleon wrasse spawn in the morning around 8am-10am or after water change. - Hatching occurred at 16-18 hrs after spawning. The egg diameter is only 540 - 570 µm. - The size of newly hatched larvae is around 1.4 - 1.8 mm. - At day 2, eyes were already visible and gut starts to develop. - At day 3, pigmentation at posterior end of the body appeared, mouth and anal opening were visible, pectoral fins were already developed.
2. Stock enhancement of regionally over-exploited species		
2.1 Community managed sandfish sea ranching and stock release	All year round	<ul style="list-style-type: none"> - Molocaboc Island sea cucumber fishery information was obtained. - Seagrass structure and physico-chemical parameters were examined in Sitiu Diut and Sitiu Daku. to identify the suitability as sandfish habitat. - Sandfish population was surveyed in the said both sites - Seed stock was produced from community managed ocean nursery, sea ranching and stock release. - Advocacy campaign on sea cucumber fishery enhancement was implemented
2.2 Stock enhancement of donkey's ear abalone	All year round	<ul style="list-style-type: none"> - Survey of wild and hatchery-bred abalone population are being conducted monthly - The second and final batch of diet-tagged abalone (3 cm SL) obtained from the SEAFDEC AQD Abalone Hatchery were brought to Carbin Reef on released at 230-245 individuals per 100 m² belt transect 10 August. - From January 2010, a total of 112 abalone have been collected from all 10 transects. - Of these, 47.32% were wild, 4.46% wild released recaptures (recaptured-wild) and 48.21% hatchery released recaptures (from releases last August 2010). - Fully matured (Stage 3) male and female abalone was observed only in January. Most of the female abalone collected from March to September had either no developed gonads (Stage 0) or premature gonads (Stage 1) - Correlation analysis showed a high positive correlation of abalone number with dead branching corals with encrusting algae, indicating the habitat preference of the animal; branching corals provide shelter and protection and encrusting algae food. - Monthly size distribution, sex ratios, and stages of development will be analyzed and compared. Abalone density will be analyzed.
2.3 Stock enhancement of mud crab	All year round	<ul style="list-style-type: none"> - Mangrove areas in Panay were surveyed to look for an appropriate site for the mud crab population and fisheries study and at the same time as release site in the future. - Three sites were chosen from the initial 20 sites surveyed and preliminary sampling of mud crabs using bamboo (10 pieces) and net traps (3 pieces) were conducted - Among a total of 2,850 crabs identified for 3 months, 81.19% were <i>S. olivacea</i>, 18.63% <i>S. tranquebarica</i> and 0.18% <i>S. serrata</i>. - Mud crab yield from 22 days of sampling was 310.71 kg. Daily yield ranged 5.1-25.7 kg.

		<p>- Catch per unit effort in terms of quantity (crab gear⁻¹ day⁻¹) ranged 0.1656-0.5832 while in terms of biomass (g gear⁻¹ day⁻¹) ranged 22.6-61.6.</p> <p>- Catch per unit effort in terms of both quantity and biomass were significantly higher in bamboo traps than in crab pots.</p>
2.4 Socioeconomic analysis and identification of strategies for managing released stocks	All year round	<p>- As part of information, education and communication (IEC) activities to support management of wild and enhanced resources in Sagay Marine Reserve, <i>FishCast</i> (a proposed Policy Recommendations Series of SEAFDEC/AQD) featuring the abalone catch size regulation will be finalized soon and submitted to RD Head and Publications Review Committee.</p> <p>- Following the selection of site for demonstration set-up for enhancement of abalone and sea cucumber stocks near the main watch tower in Molocaboc Dacu and the concurrence of the officials of Barangay Molocaboc to create an ordinance designating such area for demo-site in June, the project stakeholders composed of SMR/LGU Sagay, LGU Brgy Molocaboc, local schools, traders, fishermen community members and SEAFDEC/AQD identified and confirmed their respective roles and responsibilities relevant to the demo-site.</p> <p>- A consultation and oceanographic survey to answer questions such as tidal flow and seed dispersal to guide management strategies and determine potential future harvest benefits from stock enhancement was conducted.</p>
3. Training course		No Activity in 2010
4. Publication		No Activity in 2010
5. Annual progress meeting and international workshop		
5.1 Annual progress meeting	Jan. 2011	- Annual meeting will be held to review the project achievement. Study leaders and the project leader will attend the meeting. Evaluators will be invited to join the meeting to review/evaluate the project achievements.
5.2 International workshop		No Activity in 2010
6. Coordination by the project leader	All year round	<p>- The present project activities were confirmed and their further progresses were encouraged through interviews with study leaders.</p> <p>- Semi-annual meeting was held on July to confirm the progress of respective activities and sub-activities.</p>

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Theme: Resource enhancement of internationally threatened and over-exploited species in Southeast Asia through stock release</p>
<p>(2) Issues in the region at the beginning of the study: The problem of diminishing populations of the CITES-listed, threatened and endangered species as well as the high value, commercially important but over-exploited species needs immediate attention in the Southeast Asian region. To address the issue on environment protection and resource conservation, SEAFDEC has implemented the project on “Stock Enhancement of Threatened Species of International Concern” under the financial support of the Government of Japan Trust Fund IV (TF-4). Under this project, SEAFDEC Aquaculture Department (AQD) has been conducting studies on basic methodologies of seed production and/or release strategies. However, basic technologies and information on stock enhancement are still lacking and further efforts are needed to enhance the said aquatic resources in the region.</p>

3.2.2 Expected final goals of the program:

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

3.2.3 “Steps” toward achieving final goals:

Step 1:

- Refinement of seed production and reproduction technologies of CITES-listed species
- Gathering baseline information of regionally over-exploited species and fisheries community
- Implementation of training course

Step 2:

- Development of release technology and establishment of spawning induction technology
- Habitat and population profiling, releasing experiments, and seminars and on-site training
- Dissemination of resource enhancement practices

Step 3:

- Biological and cost assessment for release program, and community-based farming and restocking
- Continuing juvenile production, monitoring for stock releases, assessment of impact of releases, and identification of socioeconomic management strategies
- Workshop/seminar

3.2.4 Activities in the current program:

(1) **Current position of the program:** Step 1

(2) **Program duration:** 2010-2014

(3) **Main activities**

- Stock enhancement of internationally threatened species (species listed in CITES)
 - Stock enhancement of seahorses, *Hippocampus comes* and *H. barbouri*
 - Stock enhancement of Napoleon wrasse, *Cheilinus undulatus*
- Stock enhancement of regionally over-exploited species
 - Community managed sandfish *Holothuria scabra* sea ranching and stock release
 - Stock enhancement of donkey’s ear abalone, *Haliotis asinina*
 - Stock enhancement of mud crab, *Scylla* spp.
 - Socioeconomic analysis and identification of strategies for managing released stocks of abalone and sea cucumber in the Philippines
- Technology and information transfer on resource enhancement practice through training, publication, and international workshop

3.2.5 Progress and achievements of the current program:

(1) **Main activities conducted in the current program**

- To establish resource enhancement strategies of CITES species and regionally over-exploited species.
- To establish stable seed production technologies appropriate for release, with genetic consideration.
- To develop stock enhancement strategies including site assessment, stock release, monitoring and recapture, taking into consideration impact of release on wild population and other species.
- To develop a sustainable utilization and exploitation of natural coastal resources through stock enhancement.
- To establish guidelines and demonstration sites, and to conduct seminars/lectures on stock enhancement practices in Southeast Asia.
- To assess the socioeconomic impacts of stock enhancement to fishery stakeholders, and to identify and evaluate socioeconomic approaches and management strategies suitable for adoption in fishing communities.
- To transfer basic technologies and information on stock enhancement to Member Countries.

(2) Main achievements till the end of 2010 (tentative)	
<ul style="list-style-type: none"> • Among acetes, artemia, mysid and their combinations, mysid was proved to be a most prominent food organism as diet for seahorses to improve the growth and survival of 1 to 6 months old juveniles, as well as the reproductive performance (number of infants, parturition frequency and parturition occurrence) of broodstocks. • Information on early life developmental stage of Napoleon wrasse was updated. • Potential success of sandfish stock enhancement initiatives in Molocaboc Island was indicated and production of sandfish juveniles in the hatchery from spawners obtained in the Island has been started. • A high positive correlation of hatchery-reared abalone number with dead branching corals with encrusting algae was revealed, which is indicating the habitat preference. • Site for the new mud crab had been identified and regular monthly monitoring of wild stocks has just started. • The socioeconomic study conducted IEC and organized stakeholders to improve understanding of management strategies for threatened stocks; and in June 2010 successfully facilitated the promulgation of science-based ordinance on abalone catch-size regulation in Barangay Molocaboc, Sagay. 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)	
Expected outcomes	Achievement rate (%)
<ul style="list-style-type: none"> • To establish mass production technology and broodstock management, and to develop methodology of stock enhancement practice of internationally threatened species (species listed in CITES) 	20%
<ul style="list-style-type: none"> • To verify the effectiveness of community managed sea ranching and socioeconomic strategies, and to establish release strategies of regionally over-exploited species 	20%
<ul style="list-style-type: none"> • To disseminate and demonstrate resource enhancement practices 	20%

3.2.6 Evaluation of Program activities in 2010

Generally, steady and sound results have been obtained in the current program. Not only the fundamental technology and knowledge on seed production but also the practical application to the releasing sites showed highly remarkable progress. The finding which indicates that the optimal natural food increases the reproductive performance and juvenile growth and survival of seahorses is useful because this would help increase the mass production potential of this species. This information on seed production can be used by the countries in the Southeast Asian Region. The activities on resource enhancement of abalone and sea cucumber implemented in Molocaboc Island, Sagay, are especially considered to be the right way to accomplish the stock replenishment as a practical community-based program. Although the step might not be easy, their endeavors would bear a good model for achieving the successful management strategies for threatened species in the Southeast Asian Region.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Activity / Sub-activity Title	Duration	Remarks
1. Stock enhancement of internationally threatened species		

1.1 Stock enhancement of seahorses	All year round	The study will continue to refine seed production and reproduction technologies of seahorses with focus on the use of locally available food organisms obtained from brackish water ponds (copepods and mysids) or nearby coastal waters (<i>Acetes</i>) in lieu of <i>Artemia</i> to reduce cost of hatchery production; the effect of the associated organisms on the locally available food organisms such as bacteria, protozoans or diatoms on survival and growth of seahorses will be conducted; evaluate viability of tagging techniques for seahorses using collar tags and Visible Implant Elastomer (VIE); continue data analysis and writing of reports.
1.2 Stock enhancement of Napoleon wrasse	All year round	The study will continue to do monitoring and observation on spawning behavior, embryonic and larval development of Napoleon wrasse. The study will also conduct experiments to determine the optimum temperature, light intensity, aeration rate, water flow, and food items for larval rearing.
2. Stock enhancement of regionally over-exploited species		
2.1 Community managed sandfish sea ranching and stock release	All year round	The following activities are planned <ol style="list-style-type: none"> 1. Monitor released juveniles in sea ranching sites; 2. Have a second run of stock release between March to May 2011; 3. Do regular sandfish population surveys within and outside of sea ranching sites; 4. Sustain sea cucumber ocean nursery with hatchery produced juveniles; 5. Continue collecting fishery catch data; 6. Do feedback sessions and evaluation of sea ranching and stock release activities with partners and stakeholders; and, 7. Conduct training workshop on Sandfish Nursery and Sea Ranching for local partners and stakeholders including a site visit to the sandfish hatchery
2.2 Stock enhancement of donkey's ear abalone	All year round	Wild and released hatchery-bred stocks of abalone <i>Haliotis asinina</i> will be monitored monthly in Carbin Reef, Sagay Marine Reserve until December 2011. Samples for genetic characterization from wild abalone will also be collected. These samples will be analyzed in Tohoku University as a collaborative work with Dr. Eguia (BFS) and Dr. Ikeda (TU). Growth and survival of both wild and hatchery-bred abalone will be analyzed and compared.
2.3 Stock enhancement of mud crab	All year round	Mud crab <i>Scylla</i> spp. wild population and fisheries will be monitored monthly in Brgy. Nanding Lopez, Dumangas until August 2011. Samples (100 per month) for genetic characterization will also be collected. These samples will be analyzed in Tohoku University as a collaborative work with Dr. Eguia (BFS) and Dr. Ikeda (TU). In September, seed production of mud crabs for release in the study site will be started. The most dominant species in the site will be preferred for release. This will be done at the SEAFDEC AQD Crustacean Hatchery.

2.4 Socio-economic analysis and identification of strategies for managing released stocks	All year round	The study will continue to conduct periodic socioeconomic assessment of study sites; and build baseline fishery and market information to provide basis for identification of suitable management strategies. The study will demonstrate a community-based abalone and sea cucumber ranching in collaboration with other studies under this program; and conduct periodic monitoring and evaluation of this activity to determine their effects on increasing awareness of stock enhancement, ensuring economic benefits and their consequent contribution to improved management of released stocks. The study will continue data analysis and writing of reports, papers and policy guides.
3. Training course	March or April 2011	The course will highlight SEAFDEC experiences and lessons learned from the Stock Enhancement Program funded by GOJ. Proposed topics may include the following: 1) Site assessment of proposed release site (coral reef for abalone and giant clam, mangrove for mud crabs, seagrass beds for sea cucumber and seahorses) 2) Sampling of wild population of target species for release 3) Hatchery production of the target species 4) Tagging of animals for release 5) Release strategies and actual release of hatchery reared animals
4. Publication		No Activity in 2011
5. Annual Progress meeting and international workshop		
5.1 Annual Progress meeting	Jan. 2011	Annual meeting will be held to review the project achievement. Study leaders and the project leader will attend the meeting. Evaluators will be invited to join the meeting to review/evaluate the project achievements.
5.2 International workshop		No Activity in 2011
6. Coordination by the project leader	All year round	The present project activities will be confirmed and their further progresses will be encouraged through interviews with study leaders. Semi-annual meeting will be held on July to confirm the progress of respective activities and sub-activities. Project achievements will be summarized at the end of year. Annual progress report will be prepared.

4.2 Expected Outcomes in the Year 2011

The envisaged outcomes for the second year are: 1) refinement of seed production and reproduction technologies of CITES-listed species, 2) availability of baseline information on regionally over-exploited species and fisheries community, and 3) implementation of a training course on resource enhancement practices for the ASEAN member country in order to promotion of environment-friendly resource enhancement.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Accelerating Awareness and Capacity-Building in Fish Health management in Southeast Asia
Lead Department:	Aquaculture Department
Lead Country:	The Philippines
Total Duration:	2010-2014

1. INTRODUCTION

The control of fish diseases and the promotion of fish health under farming conditions are essential components of aquaculture to ensure a stable supply of fish products. The concept of “healthy and wholesome” holistic approach to aquaculture was one of the six themes under Sustainable Aquaculture during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People” that was held in Bangkok in November 2001. Aquaculture in Asia is seen as a major sector that will augment the declining global fish production because it can feed not only the growing ASEAN population but it will also meet the demand for fish by global trade partners.

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

The status of fish health management remains generally poor in some ASEAN countries, although remarkable technical advances in the diagnosis, prevention and control of fish diseases have occurred worldwide. This requires not only technical development to enhance health of important aquatic species in Southeast Asia fisheries and aquaculture, but also the urgent acceleration of awareness and capacity building in fish health management in Southeast Asia. The latter would provoke small farmers and family-based enterprises composing a large sector of aquaculture in Southeast Asia to bring interest on fish health issues linking to the increases of productivity and food safety. Additionally, training and skills development for researchers in counterpart countries on on-site samplings and disease identification should be promoted until such time that they can do the work independently.

Of the technical aspect, the establishment of preventive management strategies should be pointed out as one of the most important development needed to maintain the disease-free status of fish stocks. This will enable the aquafarmers to strictly monitor the health status so that early and effective intervention strategies can be implemented.

The necessity to establish new methods other than chemotherapy, to prevent fish disease is increasing worldwide so as to guarantee food safety. This has accelerated studies on vaccination in recent years. However, at present, there are only a few commercially available vaccines for aquaculture animals, especially for shrimp, due to technical problems with vaccine production and delivery. Delivery by injection is not practical under field conditions. Immersion and oral administration have shown efficacy but the fate of the vaccine after uptake by epithelial and mucosal tissues and the duration of the protective response are uncertain. The use of probiotic bacteria has advanced in the last decade with the main objective of preventing bacterial diseases. The use of probiotic bacteria as a vaccine carrier could also contribute to increased productivity and food safety.

Regarding parasitic diseases, especially the study and expertise on mollusk diseases are yet very scarce in spite of the increasing economic importance of these species. In addition, as for economically important freshwater fish species used as food fish, pertinent data on the parasite fauna in Southeast Asian countries, especially Cambodia, Lao PDR and Myanmar, have not been fully investigated, while comprehensive studies in the Philippines have already been conducted. Thus, the study investigating the occurrence of parasite fauna of mollusks and freshwater fish should be undertaken, especially for new or emerging disease. The need for a regional survey on parasites in freshwater fishes which are potentially harmful to humans was also emphasized during the 41th Meeting of the Council of the Southeast Asian Fisheries Development Center.

In the Government of Japanese Trust Fund V (TF-5), the present project on Fish Health Management focuses on the acceleration of delivery of information and awareness-building among the aquafarmers. At the same time, research and technology development should remain as significant activities to sustain SEAFDEC's role as "A Leading Fish Disease Technology Center in the Region". An integrated fish-health-care system expected to be established through this project will ensure a holistic approach to a stable supply of safe aquaculture products.

2. PROGRAM

2.1 Objectives

The objectives of the Program are to: 1) accelerate awareness about fish health management in resource-deprived countries through industry-wide capacity building; 2) guarantee food safety and sustainable production through innovative research; and 3) disseminate output of the project.

2.2 Program Description

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

The Government of Japan initiated the Fish Disease Trust Fund Projects in response to the clamor for intensive research in fish health problems. Phase I (2000 to 2004) focused on technologies to control diseases through timely and accurate recognition, sound diagnostic capabilities, and control measures for various diseases. Phase II (2005-2009) focused on disease surveillance activities based on the results of the earlier program.

This project involves the following: 1) compilation of case studies that explain the problems and challenges and possible solutions to the implementation of health care in rural aquaculture, and to boost staff capability as well as develop and produce learning materials to further disseminate and sustain the activity; 2) investigation on the parasite fauna in abalone and freshwater fish and its diagnosis, pathology and host-parasite relationship; 3) refinement and application of molecular diagnostic methods for the detection of fish and shrimp viral diseases and preventive approaches that will enable the farmer to monitor the health status of their crop so that early and effective intervention strategies can be made; 4) establishment of immunization regimen for the prevention of viral nervous necrosis in high value marine fish; 5) establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important maricultured fish; and 6) evaluation of various carriers for shrimp vaccination and to establish practical delivery methods and efficacy under field conditions.

Thus this project on fish health management, which could be designated as Phase III (2010-2014), focuses on the acceleration of delivery of information and awareness-building among the aquafarmers. Particularly, the rationale of the present project is on the greater dissemination of the said knowledge, especially to the Member Countries whose fish health management capacity still needs to be developed and improved. Dissemination activities especially in Myanmar, Cambodia, Laos PDR and the Philippines need to be enhanced and accelerated because technical and

administrative systems to carry out the tasks and duties necessary for the efficient control of diseases and for consumer protection are still inadequate.

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

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

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity/Sub-activity Title	Duration	Remarks
1. Accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building		
1.1 Survey on the status and needs of primary aquatic animal health care in small-scale aquaculture	All year round	<ul style="list-style-type: none"> - Freshwater fish species are the significant species for Cambodia and Lao PDR, while brackish water, marine or freshwater species for Myanmar and the Philippines. - A field laboratory established in Myanmar in 2008 to survey health management of freshwater fishpond serves as the link by which level 1 and 2 diagnostic techniques can be disseminated to farmers. - However, the staff lacks expertise in fish diseases. - A discussion with a socio-economist firmed up the usefulness of surveys to determine the problems, needs and techniques for small holders. - Coordinated sampling cum observation trips will be done together with fish parasite project at the same time for the two studies to maximize the use of resources. - A survey questionnaire will be developed and validated in an existing Institutional Capacity Development for Sustainable Aquaculture (ICDSA) project site in consultation with ICDSA Study Leaders. - Aqua Health Online is being implemented from July-December 2010 with 4 GOJ-funded participants from Cambodia, Myanmar, Philippines and Thailand. - Lao PDR did not send a nominee and the slot was given to Thailand. - On-site Basic Training on Freshwater Fish Health Management (in Lao PDR) scheduled in this year is now in preparation.
1.2 Surveillance and training on parasite fauna of freshwater fish in some Southeast Asian countries	All year round	<ul style="list-style-type: none"> - Parasitological detection methods and techniques to identify zoonotic parasites in freshwater fish have been drafted. - Procurement of chemicals to be used for detection methods is on-going. Library work/literature search was continuously done to update information on parasitological methods and techniques to identify zoonotic parasites in fish. - Sampling will be conducted on the 3rd Quarter or 4th Quarter of 2010 in Lao PDR.

2. Innovative Research to Guarantee Food Safety and Sustainable Production		
2.1 Molecular diagnosis and prevention of economically-important viruses in fish and shrimp	All year round	<ul style="list-style-type: none"> - Optimizing cloning protocol for the development of plasmid positive controls of different fish and shrimp viruses is on-going. - The optimization work started with White Spot Syndrome Virus. - The recombinant vector was transformed into competent E. coli. Plasmid DNAs of WSSV clones were linearized by Hind III digestions. - Positive clones were also analyzed using colony PCR to make sure that the clones have insert. - Clones with insert were stocked in -80°C.
2.2 Establishment of immunization regimen for the prevention of viral nervous necrosis in high value marine fish	All year round	<ul style="list-style-type: none"> - Antibody titres in the sera of vaccinated sea bass, intraperitoneally vaccinated with formalin-inactivated Philippine strain of betanodavirus, peaked at 2 mos post-vac and markedly dropped at 12 mos post-vac. - These fish were then given booster vac in Oct 2008 and 2009 and kinetics of antibody productions were monitored at various time points post-booster vac. - Mean antibody titres in the sera of 2008 booster-vaccinated sea bass taken at 1, 3, 5, 7, and 9 months post-primary booster vac were 12800, 11520, 3480, 1760, and 1120, respectively.
2.3 Establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important cultured fish	All year round	<ul style="list-style-type: none"> - Bacterial isolation from the kidneys and gut of healthy pompano was conducted. - Bacteria that grew on NA+ and TCBS plates were purified and stocked in 1/3 strength NA+ tubes. - Pompano pre-broodstock with exophthalmia was subjected to bacterial isolation. - A yellow-pigment producing bacterium was isolated from the eye, brain, and kidney. - Its high pathogenicity to healthy pompano was confirmed with development of exophthalmia followed by eventual death. - Isolation of bacteria with antiviral potential from the kidneys and gut of healthy groupers was conducted.
2.4 Evaluation of carriers for practical delivery of vaccines to shrimp and other crustaceans	All year round	<ul style="list-style-type: none"> - Field efficacy evaluation trial of the formalin-killed WSSV vaccine has been completed. - Adequate quantity of the virus for vaccinating 40,000 postlarvae was obtained by experimental infection of juveniles in tanks. - Vaccination of the postlarvae was done by immersion before stocking. - Subsequent booster vaccinations were done orally via the feed every 15 day intervals. - Monitoring of water quality, bacterial population, occurrence of WSSV and growth was done at regular intervals. - No adverse environmental effects or WSSV occurrence have been noted. - Shrimp were harvested on the 115th day of culture with no recorded mass mortalities. - Additional confirmatory tank experiments are being conducted. Analysis of data is ongoing.
2.5 Parasitic and shell diseases of abalone (<i>Haliotis asinina</i>) in Philippines	All year round	<ul style="list-style-type: none"> - Gross examination of the abalone shell revealed the presence of polychaetes belonging to the family Serpulidae (prevalence, 37%), Dorveillidae (24%) and Spionidae (prevalence, 32%).

		<p>-Histological examination showed ciliates (prevalence, 32%), gregarine-like organisms (prevalence, 12%) and enysted metazoan (prevalence, 24%).</p> <p>-Values of condition index (CI) showed significant decline in heavily infected abalone with parasites.</p> <p>-Histological slide preparation and analysis of abalone samples (monthly) is on-going.</p> <p>-Statistical analysis is being analyzed. Digital photographs of some shell diseases and parasites were submitted to experts or confirmation.</p>
3. Dissemination of Output of the Project		
3.1 Publication of new information into popular materials	July December	<p>-A manual on disease prevention and control of viral nervous necrosis has been published.</p> <p>-Translation of the manual and other popular fish health-related documents (posters, flyers) to other languages such as Burmese will be done.</p>
3.2 Maintenance and updating of website contents		No Activity in 2010
4. Annual Progress Meeting and International Workshop		
4.1 Annual Progress Meeting	Jan. 2011	- Annual meeting will be held to review the project achievement. Study leaders and the project leader will attend the meeting. Evaluators will be invited to join the meeting to review/evaluate the project achievements.
4.2 International Workshop		No Activity in 2010
5. Coordination by the Project Leader	All year round	<p>-The present project activities were confirmed and their further progresses were encouraged through interviews with study leaders.</p> <p>-Semi-annual meeting was held on July to confirm the progress of respective activities and sub-activities.</p>

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

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

3.2.2 Expected final goals of the program:

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

3.2.3 “Steps” toward achieving final goals:

Step 1:

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

Step 2:

- Conduct training course to improve awareness about fish health management
- Training of counterparts in host countries on on-site sampling and identification of disease or disease-causing organisms
- Determination of threshold levels of Koi herpes virus, viral nervous necrosis and Iridovirus in fish and white spot syndrome virus, infectious hypodermal and hematopoietic necrosis virus, Taura syndrome virus and infectious myonecrosis virus in shrimp
- Determination of the correct timing/schedule of booster vaccination
- Screening of bacteria and bioactive compounds from seaweeds for their antiviral activity in vitro and in vivo
- Tests of booster immunization schemes and various delivery methods
- Epidemiological investigation of parasitic diseases in the grow-out of abalone in Igang Marine Station
- Workshop/seminar

Step 3:

- Plan and implement guided research and information dissemination
- Completion of baseline information on parasite fauna found in wild and cultured freshwater fish in Southeast Asian region
- Application of Q-PCR and LAMP optimized protocols in surveillance and diagnosis of fish and shrimp viruses and susceptibility experiment
- Investigation on the duration of protection in larvae conferred by maternal antibodies and selection of less stressful routes of booster vaccine administration
- Characterization and purification of the novel antiviral compounds from bacteria and seaweeds and assay of their efficacy
- Test of vaccine efficacy in different shrimp species under laboratory conditions and verify the efficacy under farm conditions
- Description of diagnosis of infection, accomplishment of infection bioassay and establishment of methods of prevention
- Dissemination of output of the project

3.2.4 Activities in the current program:

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

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program <ul style="list-style-type: none"> • To equip the Fish Health staff in target countries with capabilities to do disease surveillance and to conduct simple research related to diseases and food safety • To investigate the parasite fauna in both wild and cultured freshwater fish of some Member Countries and to examine its diagnosis of infection, pathology and the host-parasite relationship • To develop Q-PCR-based detection method for fish and shrimp viral pathogens • To establish immunization regimen for the production of VNN-resistant sea bass and grouper brood stocks • To isolate indigenous bacteria, fungi and viruses from wild and cultured freshwater and marine fishes, and indigenous seaweeds, that possess antiviral properties against important viral diseases • To provide preliminary information for a later field trial with vaccines delivered by a vector/carrier • To investigate shell abnormalities and diseases of abalone with particular reference to parasites • To disseminate output of the project
(2) Main achievements till the end of 2010 (tentative) <ul style="list-style-type: none"> • A survey questionnaire is ready for validation in an ICDSA (Institutional Capacity Development on Sustainable Aquaculture) project site. • On-site Fish Health Management Training Course on Freshwater Fish will be conducted on November 2010 in Lao PDR. • The development of plasmid positive control for White spot syndrome virus (WSSV) was optimized. • Data on kinetics of neutralizing antibodies and timing of booster vaccination in sea bass obtained from 2007 to date indicate the feasibility of establishing a vaccination regimen against VNN in sea bass broodstocks. • In the course of sampling on bacteria with anti-VNN activity from marine fish, a yellow-pigment producing bacterium isolated from the eye of pompano with exophthalmia showed that exophthalmia could be reproduced in healthy pompano juveniles. • The field trial demonstrated that growth and survival was improved with the use of formalin-inactivated vaccine. • Gross and histological examination revealed the presence of shell-boring polychaetes (Serpulidae, Dorveillidae and Spionidae) and ciliates, protozoans (<i>Nematopsis</i> sp.) and cestodes (<i>Tylocephalum</i> sp.) in the shells and tissues of abalone respectively.

(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)	
Expected outcomes	Achievement rate (%)
<ul style="list-style-type: none"> To accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building. 	15%
<ul style="list-style-type: none"> To guarantee food safety and sustainable production through innovative research. 	20%
<ul style="list-style-type: none"> To disseminate output of the project. 	15%

3.2.6 Evaluation of Program activities in 2010

Most of the activities/sub-activities, particularly those of disease prevention technology are judged to proceed steadily and favorably. The field trial which has demonstrated the efficacy of formalin-killed virus as a vaccine against WSSV has brought verifiable results and if highly evaluated, this could be applied to farmers. On the other hand, while dissemination and awareness of fish health management through e-Learning are on-going and considered well in progress in accordance with the original plans as of mid October, the on-site training scheduled in Lao PDR is still under preparation because of difficulty of communications between AQD and Lao PDR. Since awareness of fish health management through capacity building is one of the main goals in this program, which was already approved in the last Program Committee Meeting and the Council Meeting, the involvement of Member Countries on this program is highly encouraged and appreciated.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Activity / Sub-Activity Title	Duration	Remarks
1. Accelerating awareness about fish health management in resource-deprived countries through industry-wide capacity building		
1.1 Survey on the status and needs of primary aquatic animal health care in small-scale aquaculture	All year round	The publication or translation of flyers, and field guides/posters to support the objectives of Sub-activity 1.2 will be undertaken. Depending on available funds, a small-budget collaborative research with AQD partner institution(s) staff in member country(ies) on topics incorporating fish health management concepts based on the identified gaps and issues obtained in the 2010 survey of the study will be implemented. The partner institution will be encouraged to develop a proposal to obtain counterpart funding. Dissemination of new information will continue to further sustain the activity.
1.2 Surveillance and training on parasite fauna of freshwater fish in some Southeast Asian countries	All year round	Freshwater fish species are widely cultured and used as food fish in Southeast Asia. With intensification of the aquaculture industry in the region, heavy losses due to diseases including parasites have become one of the major concerns. Since most of these freshwater fish species are potential carriers of zoonotic parasites (Huss and Embarek 2003), parasite fauna especially those with zoonotic potential of both wild and cultured freshwater fish will be investigated in SEAFDEC selected countries (Cambodia, Myanmar, and Lao PDR). Common carp (<i>Cyprinu carpio</i>), catfish (<i>Clarias macrocephalus</i>) and Javanese carp (<i>Puntius goniotus</i>), and catla (<i>Catla catla</i>), rohu (<i>Labeo</i> .

		<i>rohita</i>) and <i>mrigala</i> (<i>Cirrhina mrigala</i>) will be the priority species to be collected in Cambodia and Myanmar, respectively. Tilapia (<i>Oreochromis</i> spp.), silver carp (<i>Hypophthalmichthys molitrix</i>) and common carp (<i>C. carpio</i>) will be the fish species to be examined in Lao PDR. In addition, on-site basic training course on freshwater fish health management with emphasis on fish parasites in the target countries will be conducted.
2. Innovative Research to Guarantee Food Safety and Sustainable Production		
2.1 Molecular diagnosis and prevention of economically-important viruses in fish and shrimp	All year round	Plasmid positive controls that were developed earlier will be used as standards in the optimization of the remaining q-PCR protocols for shrimp (IHNV, TSV and IMNV) and fish (Iridovirus and KHV) viruses. This will be a continuation of the q-PCR optimization activities earlier done on WSSV and VNN. Another is the determination of threshold levels of target shrimp and fish viruses will be conducted through viral infection experiments and by using the optimized q-PCR protocols.
2.2 Establishment of immunization regimen for the prevention of viral nervous necrosis in high value marine fish	All year round	The effect of inactivated betanodavirus vaccine on the kinetics and timing of neutralizing antibodies and booster vaccination, respectively, in sea bass broodstock candidates have been documented since 2007 until last quarter of 2010. Since some of these vaccinated fish have already been identified as sexually matured, induced spawning will be conducted in 2011. Also pompano with MBW of 588 g (n=50), reared in floating net-cages in IMS, were vaccinated in Feb 2010. Antibody titer detection in vac and control fish have been conducted at scheduled intervals to date. Recent sampling (Aug 2010) also showed that vac fish (MBW: 1.6 kg) may be subjected to induce spawning in 2011. Once successful, RT-PCR and cell culture methods will be conducted to detect the presence of betanodavirus in the offspring. Additionally, the protective effect of maternal antibodies in the offspring will be examined through experimental virus challenges.
2.3 Establishment of novel prophylactic and therapeutic methods for the prevention of viral infections in commercially important cultured fish	All year round	Isolation of bacteria from the gut of cage-reared groupers and pompano and subsequent screening of the isolated bacteria for anti-nervous necrosis (NNV) activity were conducted in 2010. Anti-NNV screening of the candidate bacteria is still ongoing. For 2011, continued sampling and anti-NNV screening of potential bacterial candidates not only from cage-cultured but as well as wild marine and freshwater fish species will be conducted.
2.4 Evaluation of carriers for practical delivery of vaccines to shrimp and other crustaceans	All year round	Carriers to be screened will include the following: live and inactivated recombinant bacteria, probiotic (LAB) bacteria, lipid vesicles, and chitosan. Recombinant <i>E. coli</i> produced in TF IV will be used. Production of recombinant lactic acid bacteria will be attempted. Incorporation of vaccines in liposomes or chitosan will be evaluated to determine their protection of antigens in the acidic gut environment to increase vaccine efficacy. The most effective dosage and vaccine to carrier ratio will be determined in vivo by a challenge experiment. The best results will feed into booster interval and delivery method experiments.
2.5 Parasitic and shell diseases of abalone (<i>Haliotis asinina</i>) in Philippines	All year round	Abalone is a high value species which, despite advances in culture practices, is still prone to high mortality when infested by parasitic diseases. This study will continue to conduct intensive parasite screening of the different stages

		of cultured abalone reared in cage grow out and in hatchery. Specifically, it will determine the prevalence rate (%), intensity rate (%), and condition index of potential pathogenic parasites in cultured abalone using wet mount and histological techniques. In addition, this study will also investigate the pathogenicity of parasites through experimental infection to determine their effect on the health and growth of cultured abalone.
3. Dissemination of Output of the Project		
3.1 Publication of new information into popular materials	Nov. & Dec.	Outputs from the project will be disseminated through manuals, flyers, field guides, <i>etc.</i> among the Member Countries. These documents will be made available to all stakeholders to maintain a high level of awareness of the issues, challenges, and possible solutions to problems pertaining to fish health management in small-holder aquaculture.
3.2 Maintenance and updating of website contents	March Jun September December	The GOJ-TF website contents will be updated with new information resulting from research outputs and surveillance and capacity-building activities. Portable document format (PDF) of new flyers and field guides will be uploaded to the website.
4. Annual Progress Meeting and International Workshop		
4.1 Annual Progress Meeting		No Activity in 2011
4.2 International Workshop	December	New information on fish health management particularly in small-holder farms in rural communities and progress of innovative research to prevent devastating diseases will be presented by participants from ASEAN Member Countries, resource persons as well as study leaders in this project. Emerging problems that require urgent solutions will also be discussed to pave the way to food safety and to assure sustainable aquaculture in the Southeast Asian region.
5. Coordination by the Project Leader	All year round	The present project activities will be confirmed and their further progresses will be encouraged through interviews with study leaders. Semi-annual meeting will be held on July to confirm the progress of respective activities and sub-activities. Project achievements will be summarized at the end of year. Annual progress report will be prepared.

4.2 Expected Outcomes in the Year 2011

The envisaged outcomes for the second year are to: 1) improve awareness about fish health management in Member Countries through industry-wide capacity building; 2) survey health status program to assess the presence and prevalence of parasites in freshwater fish in Cambodia, Lao PDR and Myanmar; 3) develop and optimize the remaining q-PCR protocols of fish (Iridovirus and KHV) and shrimp (IHHNV, TSV and IMNV) viruses and also establishment of viral threshold levels; 4) monitor the kinetics of betanodavirus-neutralizing-antibodies in previously vaccinated sea bass and pompano broodstocks and examine the protective effects of maternal antibodies in offspring; 5) isolate indigenous bacteria and viruses with antiviral potentials and to screen antibacterial and antiviral compounds from seaweeds; 6) determine the efficacy of formalin-killed vaccine against WSSW and to screen suitable carriers for vaccine delivery in shrimp through field trial; 7) investigate parasitic diseases in hatchery-reared abalone epidemiologically; and 8) implement training course for the ASEAN member country in order to accelerate awareness and capacity-building in fish health management in Southeast Asia.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Food Safety of Aquaculture Products in Southeast Asia
Lead Department:	Aquaculture Department/MFRD
Lead Country:	The Philippines
Total Duration:	2010-2014

1. INTRODUCTION

The use of antibiotics and other chemicals in aquaculture is widely practiced to help meet the increasing demand for aquaculture food. These antibiotics and chemicals detected in aquaculture products appear to derive from material inputs during rearing, mostly from contaminated feed ingredients and the rapeutants for prevention or treatment of diseases. Thus, cultured shrimps and fish in various stages from hatcheries to grow-out ponds are exposed to chemical contamination. On the other hand, with the ever-growing and worldwide concern for food safety, fish farmers are faced with the challenge of producing safe food from farm to fork. Government regulations are becoming stricter on the uncontrolled use of chemicals due to their adverse effects on human health, the environment and the development of pathogen resistance. Many chemicals have already been banned and the use of some is being regulated. The spectrum of allowable chemicals for aquaculture is becoming narrower, with the trend towards the use of environment friendly mitigating agents geared to a more responsible approach to aquaculture.

The mechanisms of accumulation and withdrawal of some antibiotics and chemicals have already been studied in developed countries. However, these data were generated using their species and under environmental conditions that are different from the conditions prevalent in the Southeast Asian region. Moreover, there are very limited data available on the withdrawal period of antibiotics and the presence of chemical residues in aquaculture products from the region, a considerable portion of which are exported to developed countries. Considering the growing-awareness on issues of food safety of aquaculture products, it is an urgent matter that SEAFDEC should take the lead in establishing regional guidelines on the right usage of antibiotics and other chemical inputs that will allow farmers to increase production of safe food using the environment-friendly technologies that will be developed by implementing the proposed project. The results of this project will also be useful for the formulation of policy recommendations for a concerted action by governments of the ASEAN Member Countries.

2. PROGRAM

2.1 Objectives

The objectives of the Program are to: 1) contribute in the establishment of guidelines on the production of safe aquaculture products from Southeast Asia; 2) Determine the presence and levels of commonly used chemicals in aquaculture in aquaculture products such as fish and shrimps; 3) Investigate the status of antibiotics and chemical use in aquaculture in Southeast Asian countries; and 4) Compile and disseminate SEAFDEC guidelines on the use of antibiotics and chemicals in aquaculture to the ASEAN region.

2.2 Program Description

The Aquaculture Department of SEAFDEC will be responsible for this project and will manage and coordinate all project activities. Other ASEAN Member Countries, which have been

identified as core countries, will be contacted for possible collaboration on the surveillance of chemicals usage/regulation, and the analysis of the target chemicals under a cost-sharing basis. Surveillance activity of chemical contaminants such as pesticides, mycotoxins and antibiotics will be continued based on the results of TF4.

The expected outputs for the project will include the establishment of guidelines on appropriate administration and withdrawal of chemicals that are easily adopted by the fish farmers in the ASEAN region. The guidelines will also be useful for some possible action or policy formulations by governments of the ASEAN Member Countries. Seminars and lectures on food safety awareness for stakeholders will be conducted annually.

Project monitoring and evaluation will include annual progress report/meeting, publication of project achievements and International Workshop. An International Workshop on “Food Safety of Aquaculture Products in Southeast Asia” will be conducted to collect and exchange updated information among the Member Countries.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity / Sub-Activity Title	Duration	Remarks
1. Withdrawal period of antibiotics in milkfish, <i>Chanos chanos</i> and some freshwater fish species cultured in the tropics		<ul style="list-style-type: none"> • Completion of feeding experiment on milkfish; extraction and analysis of oxytetracycline (OTC) and oxolinic acid (OA) from blood, muscles and liver are on going. • Continue extraction and analysis activities and analysis of data to evaluate accumulation pattern and withdrawal periods of OTC and OA on milkfish.
2. Surveillance of chemical contaminants in aquaculture products and feeds	All year round	<ul style="list-style-type: none"> • Samples from Cebu province consisted of three fish species and four commercial feeds. • Samples from part of Mindanao have also been collected and processed for analysis. • Aquaculture products and feed samples from other regions of the Philippines will be collected. These will be analyzed for chemical contaminants before the year will end.
3. Investigation of the situation of antibiotics/chemicals usage and regulations in aquaculture	All year round	No activity in 2010.
4. Guidelines on appropriate administration and regulation of antibiotics/other chemicals		
4.1. Guideline preparation/publication		No Activity in 2010
4.2. Training course/e-Learning	Nov.	<ul style="list-style-type: none"> • A 2-day seminar on Food Safety was tentatively scheduled on 25-26 Nov 2010. The venue will be determined in due time. • Member countries will be invited to participate as well as staff from local agencies like BFAD, BFAR, DOST, LGUs, Grower Associations, and also international funding partners such as FAO, NACA, WorldFish, MRC, etc.
5. Dissemination of food safety awareness and manual publication		No Activity in 2010
6. Annual Progress Meeting and International Workshop		
6.1. Annual Progress Meeting	Jan. 2011	• Annual meeting will be held to review the project

		achievement. Study leaders and the project leader will attend the meeting. Evaluators will be invited to join the meeting to review/evaluate the project achievements.
6.2. International Workshop		No Activity in 2010
7. Coordination by the Project Leader	All year round	<ul style="list-style-type: none"> The present project activities were confirmed and their further progresses were encouraged through interviews with study leaders. Semi-annual meeting was held on July to confirm the progress of respective activities and sub-activities.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

(1) Theme: Food safety of aquaculture products in Southeast Asia
(2) Issues in the region at the beginning of the study: The use of antibiotics and other chemicals in aquaculture is widely practiced to help meet the increasing demand for aquaculture food. These antibiotics and chemicals detected in aquaculture products appear to derive from material inputs during rearing, mostly from contaminated feed ingredients and the rapeutants for prevention or treatment of diseases. Thus, cultured shrimps and fish in various stages from hatcheries to grow-out ponds are exposed to chemical contamination. On the other hand, with the ever-growing and worldwide concern for food safety, fish farmers are faced with the challenge of producing safe food from farm to fork. There are very limited data available on the withdrawal period of antibiotics and the presence of chemical residues in aquaculture products from the region. Considering the growing-awareness on issues of food safety of aquaculture products, it is an urgent matter that SEAFDEC should take the lead in establishing regional guidelines on the right usage of antibiotics and other chemical inputs that will allow farmers to increase production of safe food using the environment-friendly technologies.

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> To clarify withdrawal period of antibiotics in fish species cultured in the tropics To survey chemical contaminants in aquaculture products and feeds To investigate the situation of antibiotics/chemicals usage and regulations in aquaculture To establishment of guidelines on appropriate administration and regulation of antibiotics/other chemicals
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3.2.3 “Steps” toward achieving final goals:

Step 1: <ul style="list-style-type: none"> Literature survey & method validation Acquisition of reagents, sample collection in Philippines and analysis of samples Surveillance of antibiotics/chemicals usage Training course
Step 2: <ul style="list-style-type: none"> Administration trial & analysis Sample collection in other countries and analysis of samples Continued surveillance of antibiotics/chemicals usage Continued training course and preparation of e-Learning
Step 3: <ul style="list-style-type: none"> Evaluation of the mechanism of accumulation and withdrawal of antibiotics and formulation of guidelines on drug administration for responsible aquaculture Continued sample analyses and preparation/submission of reports Update of Baseline data Guideline preparation /publication and e-Learning

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1
(2) Program duration: 2010-2014
(3) Main activities <ul style="list-style-type: none"> • Withdrawal period of antibiotics in milkfish and some freshwater fish species cultured in the tropics • Surveillance of chemical contaminants in aquaculture products and feeds • Investigation of the situation of antibiotics/chemicals usage and regulations in aquaculture • Guidelines on appropriate administration and regulation of antibiotics/other chemicals

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> • To extract and analyze antibiotics from marine fish such as milkfish and freshwater fish such as tilapia • Determine the presence or levels of commonly used chemicals in aquaculture in aquaculture products such as fish and shrimps. 	
(2) Main achievements till the end of 2010 (tentative)	
<ul style="list-style-type: none"> • Antibiotic analysis is on-going for aquaculture products such as fish (milkfish, rabbitfish, seabass, snapper & tilapia) and crustaceans (<i>P. monodon</i> and <i>L. vannamei</i>) obtained in some parts of Luzon, Visayas and Mindanao. • Zero residual concentration of OTC on muscles of milk fish fed with medicated diet for 10 days was evaluated to be 24 days after the last administration of the drug. 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)	
Expected outcomes	Achievement rate (%)
• To clarify withdrawal period of antibiotics in fish species cultured in the tropics	10%
• To survey chemical contaminants in aquaculture products and feeds	10%
• To investigate the situation of antibiotics/chemicals usage and regulations in aquaculture	0%
• To establishment of guidelines on appropriate administration and regulation of antibiotics/other chemicals	5%

3.2.6 Evaluation of Program activities in 2010

Oxytetracycline depletion profile clearly shown in the muscle of milkfish has been providing practical and significant findings which could help establish guidelines in the future. Surveillance of the chemical contaminants is also resulting in essential information that can be used later to increase the awareness of food safety not only among the consumers but also the producers involved. Considering such importance, both activities are considered on the right way to establish the guidelines on chemical usage in the future. Moreover, based on the progress made as of mid October, the activities are on-track. On the other hand, for example, differences of the depletion profiles between muscle, blood and liver, and between species, and dose dependencies of the time decay curve of antibiotics, if any, would be more precise and precious information for proceeding food safety, together with the broader information on chemical contaminants in aquaculture products and feed. Therefore, further progresses are highly expected for both activities.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Activity/ Sub-Activity Title	Duration	Remarks
1. Withdrawal period of antibiotics in milkfish, <i>Chanos chanos</i> and some freshwater fish species cultured in the tropics		The withdrawal period will be evaluated in tilapia which is one of the most common fish species being cultured especially in the Asian countries. Tilapia can be considered disease-resistant fish species, however, due to their increasing demand for consumption, various culture systems were employed to increase production and supply which in turn may contribute to the development of diseases. Planned activities include feed preparation, feeding experiment with antibiotic treatment, extraction and analysis of antibiotic in the fish muscles, blood and fatty tissues. Results will contribute to the establishment of guidelines for the production of safe aquaculture products in Southeast Asia.
2. Surveillance of chemical contaminants in aquaculture products and feeds	All year round	Samples of aquafeed and aquaculture products such as shrimps and fish will be collected from a Southeast Asian country. These will be brought to the laboratory and analyzed for chemical contaminants such as antibiotics, pesticides and possibly for some heavy metals.
3. Investigation of the situation of antibiotics/chemicals usage and regulations in aquaculture	All year round	Efforts to update the general information base on chemical use in aquaculture in Southeast Asia as well as the regulatory frameworks in various Southeast Asian countries governing the use of chemicals to ensure food safety and minimize the impacts on the environment and public health will be started. The questionnaires on these topics will be formulated and pre-tested in 2011.
4. Guidelines on appropriate administration and regulation of antibiotics/other chemicals		
4.1. Guideline preparation/publication		No Activity in 2010
4.2. Training course/e-Learning	All year round	
5. Dissemination of food safety awareness and manual publication		In support of developing responsible approaches to aquaculture, pamphlets, fliers, and posters on food safety of aquaculture products for the general public will be drafted, produced and distributed in collaboration with Training and Information Division in 2011.
6. Annual Progress Meeting and International Workshop		
6.1. Annual Progress Meeting	Jan. 2011	Annual meeting will be held to review the project achievement. Study leaders and the project leader will attend the meeting. Evaluators will be invited to join the meeting to review/evaluate the project achievements.
6.2. International Workshop		No Activity in 2010
7. Coordination by the Project Leader	All year round	The present project activities will be confirmed and their further progresses will be encouraged through interviews with study leaders. Semi-annual meeting will be held on July to confirm the progress of respective activities and sub-activities. Project achievements will be summarized at the end of year. Annual progress report will be prepared.

4.2 Expected Outcomes in the Year 2011

The envisaged outcomes for the second year are to: 1) survey literature and to validate method, 2) acquire reagents, to collect sample in Philippines and to analyze samples, 3) implement surveillance of antibiotics/chemicals usage, and 4) to disseminate food safety awareness for the ASEAN member country in order to secure food safety of aquaculture products in Southeast Asia.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) 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:	TBD
Total Duration:	2008 - 2012
Proposed Budget:	USD 96,500

1. INTRODUCTION

It is believed that pelagic fishes migrate for their ecological demand of spawning and feeding habits to the optimum environmental conditions on current, water temperature, salinity, chlorophyll and prey. This migration provides important information for 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, genetic study and morphometric analysis were conducted to identify sub-population and shared stock of the targeted small pelagic fishes. However, sub-populations of these fishes as management unit could not be confirmed clearly.

Tagging activity is one of the methods commonly used to study migration route of small pelagic fishes, which sometimes uncovers hidden migration routes. In the Gulf of Thailand, 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 Straits of Malacca 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 inadequate to used for the purpose of managing the fishery.

Therefore, study on migration patterns of small pelagic fishes in the region is an urgent need. Although trend of annual catch for the past 20 years shows that the status of the resource is still good, information of the resources is still lacking. The study will provides information for stock identification and more importantly, to confirm on the extent of sharing of the stock in the region.

2. PROGRAM

2.1 Objectives

The objectives of this project are:

- 1) To examine the movement and migration routes of the targeted pelagic fishes (TPF) in the South China Sea (SCS) and Andaman Sea (AS).
- 2) To compare the growth patterns of the TPF in the SCS and AS.
- 3) To compare the results of growth patterns for the TPF between the tagging program and FiSAT analysis in the 1st phase of JTF II in the SCS.
- 4) To conduct genetic analyses for population study to confirm existence/absence of sub-populations in the region and for species identification.
- 5) To suggest a management plan of purse seine fisheries in the SCS with reference to the obtained information and outcomes of the 1st phase of JTF II project.

2.2 Program Description

MFRDMD is the responsible SEAFDEC Department for this project to manage and coordinate all project activities in collaboration with TD. Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Vietnam are involved in the tagging activities.

The project involves on-site training for tagging in each participating SEAFDEC Member Countries, tagging implementation and genetic study in both the South China Sea and Andaman Sea. Tagging poster printed in national language was distributed throughout the countries involved to promote awareness on the project and to inform public on the reward given upon returning of recaptured tagged fish to the authority. Databases namely, “Data Management Software for small pelagic fish” and “Data on tagging” were developed and promoted as the main storage for all project data. The genetics study requires collection of tissue samples from all the identified tagging sites and DNA works on these samples.

Analysis on the tagging and recapture data will be done during the regional workshop that has been proposed to be held in July-December 2011. Results obtained by the country from the workshop will be presented in the terminal regional technical consultation in June 2012. Outcome from the consultation will be compiled in the terminal report of the project that to be published at the end of 2012.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
Project 1: Meetings/Workshops/ Trainings Activity 1: The 3 rd Core Expert Meeting	March 2010	The 3rd Core Expert Meeting was held in 8-9 March 2010 in Melaka, Malaysia. The meeting discussed progress of the project implementations in 2009 and formulated the final research plan for tagging in the South China Sea and Andaman Sea for 2010 and onward.
Project 2: Tagging Operation in the South China Sea and Andaman Sea Activity 1: Tagging operation in the South China Sea	Jan-Dec 2010	Tagging operations were conducted in the participating SEAFDEC Member Countries at ten tagging sites in the South China Sea. The targeted species were <i>Rastrelliger kanagurta</i> , <i>R. brachysoma</i> , <i>Decapterus maruadsi</i> and <i>D. macrosoma</i> . Totally 10,900 tails of fish are expected to be tagged.
Activity 2: Tagging operation in the Andaman Sea	Jan-Dec 2010	Tagging operations were conducted in the participating SEAFDEC Member Countries at five tagging sites in the Andaman Sea. The targeted species of small pelagic fishes were <i>Rastrelliger kanagurta</i> and <i>R. brachysoma</i> . Totally 7,000 tails of fish are expected to be tagged.
Project 3: Data Collection and Analysis Activity 1: Data collection and verification	Jan-Dec 2010	Information for the tagged and recaptured fish was verified and entered into the database that developed by SEAFDEC-TD.

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Theme: Resource management of small pelagic fishes in the South China Sea and Andaman Sea</p> <p>(2) Issues in the region at the beginning of the study: Total catch of small pelagic fishes, such as Indian mackerels and round scads, consists more than 10% of the marine capture production in the Southeast Asian region. Not only these small pelagic fish is important as food resources, but also capture fisheries targeting these species are of fundamental importance to this region in terms of employment and livelihood of fishers. However, we are still negligent in the management of these pelagic fish resources. For sustainable use of these resources, formulation of a management plan of these resources and fisheries in the region with reference to the biological information of targeted species is crucial.</p>
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3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • To contribute for the formulation of a management plan of the purse seine fisheries and pelagic fish resources in the region with reference to the biological information of targeted species; • To achieve fishery management of the targeted small pelagic fish resources in the region to sustain the fisheries for the continuous food supply, employment and fishers' livelihood, based on the biological and economical analyses of the information and data.
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3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Information collection for sustainable pelagic fisheries in the South China Sea</p> <ul style="list-style-type: none"> • To clarify the actual status of operation (including FAD) and catches of the purse seine fishery; • To estimate some resource indicators, such as landings, CPUE, catch composition in the purse seine fishery; • To collect biological information of small pelagic fishes that is crucial for management of these species.
<p>Step 2: Tagging program for economically important pelagic species in the South China Sea and Andaman Sea</p> <ul style="list-style-type: none"> • To know moving behavior and migration routes of small pelagic fishes; • To clarify subpopulation structures of these small pelagic fish that is crucial for management purpose through genetics study.
<p>Step 3: Formulation of recommendation for small pelagic fish management plans in the ASEAN region.</p> <ul style="list-style-type: none"> • To estimate status and trend of some pelagic fish resources; • To formulate management plans for sustainable use of these resources.

3.2.4 Activities in the current program:

<p>(1) Current position of the program: Step 2</p>
<p>(2) Program duration: 2008-2012</p>
<p>(3) Main activities</p> <ul style="list-style-type: none"> • Tag and recapture study of economically important small pelagic fishes to understand their migrating route and sub-population structures for their future management purpose in the South China Sea and Andaman Sea.

3.2.5 Progress and achievements of the current program:

<p>(1) Main activities conducted in the current program</p> <ul style="list-style-type: none"> • To prepare and to disseminate technique for tagging implementation of small pelagic fishes in each participating Member Countries (on-site training, formulation of SOP, purchasing of tagging materials, etc). • To implement tag and recapture study for targeted small pelagic fishes in eight Member Countries. • To analyze recovering data to understand the migrating routes and sub-population structures of the targeted small pelagic fishes. • To conduct genetics study to confirm on the existence of sub-population of the targeted small pelagic

fishes	
(2) Main achievements till the end of 2010 (tentative)	
<ul style="list-style-type: none"> • Three Core Expert Meetings and demonstration of tagging experiment; • Implementation of the on-site trainings for tagging implementation in eight Member Countries; • Formulation of Standard Operating Procedure (SOP) for tagging small pelagic fishes in the region; • Making and dissemination of posters in each native languages to obtain well recovery of tagging fishes; • Promotion of the database software in Member Countries and improvement of it for tagging studies. • Implementation of tagging activities at selected study sites in each MCs. <p>Some amount of tagged fish recovery.</p>	
(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)	
Expected outcomes	Achievement rate (%)
• Preparation for tagging implementation in each Member Countries (on-site training, formulation of SOP, tagging material purchasing, etc)	100%
• Preparation for tagged-fish recovering and data compilation system	90%
• Implementation of tag and recapture study for targeted small pelagic fishes	80%
• Understanding of the migrating route of the targeted small pelagic fishes	20%
• Understanding of the subpopulation structure for management	20%

3.2.6 Evaluation of Program activities in 2010

In the South China Sea area, the achievement of tagging until October 2010 is only 56% of the targeted 10,900 fishes to be tagged. Only for *Rastrelliger brachysoma* the tagged number exceeded the target. While, *Decapterus maruadsi* is the most difficult species to be found and tagged, recorded only 2% achievement so far. In the Andaman Sea area, only 30% of the target 7,000 fishes to be tagged are tagged. *Rastrelliger brachysoma* is more common (41% tagged) compared to *R. kanagurta* (19%). Limited fund to conduct field tagging activities is the main reason for the low achievement by most of the country. On top of that, difficulty in finding the targeted species during the sea trips makes the situation worse since it requires more sea trips before the targeted tag number could be achieved. Bad weather is also said to be another factor affecting the achievement of this tagging project.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1: Meeting/ Workshop/ Trainings	July-Dec 2011	The main purpose of the workshop is to establish the standard methods for data analysis and format of country report. Data that had been collected and store in the database will be analyzed to examine the movement and migration routes of the targeted pelagic fishes (TPF) in the South China Sea (SCS) and Andaman Sea (AS). Complete report by country is to be produced by the country technical officer and to be submitted to SEAFDEC-MFRDMD before the conduct of Terminal Regional Consultation.
Activity 1.3: Workshop on data analysis		
Activity 2: Tagging Operation in the South China Sea and Andaman Sea	Jan-Dec 2011	Materials such as chemicals and veils will be purchased for genetic study.
Activity 2.4: Purchase materials for genetic study		
Activity 2.5: Tissue sample collection for genetic study	Jan-Dec 2011	Tissue samples will be collected with the aids of Member Countries both for population studies of a targeted pelagic species and for species identification.

Activity 2.6: Genetic survey for population study and species identification	Jan-Dec 2011	DNA will be extracted from the collected tissue samples and be analyzed both for population study and for species identification.
Activity 3: Data Collection and Analysis Activity 3.1: Data collection and verification	Jan-Dec 2011	Information for the tagged and recaptured fish will be verified and entered into the database that developed by SEAFDEC/TD.
Activity 3.2: Data compilation and analysis	Jan-Dec 2011	Information and data on number of fish tagged and recaptured will carefully be handled by the Technical Officers of the participating SEAFDEC Member Countries. The data will be verified before entering into the database that developed by SEAFDEC-TD and be analyzed.
Activity 5: FADs and Sardine Information Activity 5.3: Data verification and analysis	July-Dec 2011	Supplementary information on present status of fish aggregation device (FAD) operation and Sardine catch in the South China Sea will be verified and analyzed based on the collected data in the first phase of Japanese Trust Fund II project from 2002 to 2006 for an appropriate management of purse seine fishery.

4.2 Expected Outcomes in the Year 2011

1. Compiled data on tagging and recaptured tag fish in SCS and AS.
2. Findings on tagging program in terms of growth estimates and migration pattern of TPF.
3. Outputs from a workshop on data analysis.
4. Preliminary genetic results.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Research and Management of Sea Turtles in Foraging Habitats in the Southeast Asian Waters.
Lead Department:	MFRDMD in collaboration with TD
Lead Country:	TBD
Total Duration:	2010 - 2014
Proposed Budget:	USD 60,700

1. INTRODUCTION

Southeast Asian countries have been recognized as one of major nesting sites for sea turtles in the world. These reptiles are highly migratory and share several certain foraging habitats in Southeast Asian region. Thus, regional cooperation among Member Countries in conserving sea turtles is vital to ensure their survival. In addition, regional effort should be undertaken to reduce the mortality especially due to accidental catch by fishing gears. This program is aimed to conduct several research activities to collect information of sea turtles in the foraging habitats, to reduce sea turtle mortality by fisheries, and to formulate the management plans of fisheries to protect sea turtles in this region.

2. PROGRAM

2.1 Objectives

The objectives of this project are:

- 1) To collect ecological parameters of several pilot foraging habitats of sea turtles to study the key factors to manage these areas for sea turtle conservation;
- 2) To collect, compile, and review information of sea turtles migration corridors, nesting/foraging habitats, and their population structures in the region by genetic, satellite tracking, and conventional tagging studies for conservation and enhancement of the sea turtle populations in the ASEAN region;
- 3) To review fishing activities in the region which is possibly interacting with sea turtle populations in their foraging/nesting habitats and migration routes in space and time;
- 4) To promote responsible fishing gears and practices by conducting commercial demonstrations and experimental trials of modified specific fishing gears to protect sea turtle populations in the region; and
- 5) To formulate and propose management plans on fishing activities and other activities to conserve and enhance sea turtle populations in the region based on the scientific information.

2.2 Program Description

SEAFDEC MFRDMD in collaboration with TD will be the responsible Departments for this project, and will manage and coordinate all project activities. Technical Officers from selected SEAFDEC Member Countries will be invited for training of the ecological survey.

The project involves research on sea turtle foraging populations, regional meeting/workshops and information collection on the sea turtles interaction with fishing. Regional training programs will be conducted to build up capacity in ASEAN Member Countries for conservation of sea turtles in the region.

The expected outputs for the project include the biological and ecological information of sea turtles and their foraging habitats, which can be used for development of the management and conservation plans of sea turtles, and promotion of mitigation measures for fisheries suitable for the ASEAN region to reduce incidental capture of sea turtles.

Management plans for conservation of sea turtles will be formulated by the end of the project.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Project/Activity Title	Duration	Remarks
Activity 1. Meeting/Workshop Sub-Activity 1.1: The Regional Planning Workshop	March 2010	The Regional Planning Workshop was held in Malaysia to discuss on the overall project proposal for 5-years from 2010 to 2014. The Workshop also discussed to finalize the research plans for 2010. Pilot foraging habitats for the ecological survey were selected.
Activity 2. Research in Sea Turtle Foraging Populations Sub-Activity 2.1: Training for scientific survey of foraging habitats	July 2010	Scientific survey of ecological parameters in a pilot foraging habitat of sea turtles (Brunei Bay) was conducted in July. Fauna and flora on the sea bottom of the habitat were surveyed by divers. Water quality, such as salinity, temperature, turbidity, and chlorophyll content, etc., was monitored. Technical Officers from Brunei and Malaysia (Sabah) were invited for the training of the ecological survey.
Sub-Activity 2.2: Genetic study	May-Dec 2010	Because we could not catch sea turtles in a foraging site, we failed to collect tissue samples from sea turtles inhabiting a foraging site for genetic study to reveal sea turtle subpopulation structures in the region.
Sub-Activity 2.3: Tagging of sea turtles	May-Dec 2010	Materials for conventional tagging study, <i>i.e.</i> inconel tags, tag applicators, etc., were purchased and distributed to the participating Member Countries for the tagging activities in 2010. Implementation of inconel tagging was continued at the focused nesting sites of sea turtles in participating Member Countries and tag recovery had been monitored.
Sub-Activity 2.4: Satellite Telemetry	May-Dec 2010	Satellite telemetry studies for a leatherback turtle was conducted in collaboration with Department of Fisheries Malaysia. Satellite telemetry study on green turtle will be conducted in Lawas foraging habitat of Sarawak waters in October/November 2010.
Activity 3. Interaction between sea turtles and fishing Sub-Activity 3.1: Information Collection on the Sea Turtles Interaction with Fishing	May-Dec 2010	Continuation on the study for modification of responsible fishing gears to reduce the sea turtles by-catch
Sub-Activity 3.2: Information dissemination	May-Dec 2010	Promotion and awareness raising on the use of c-hook in hook-and-line fishing in SEAFDEC Member Countries

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Theme: Research and management of sea turtles in foraging habitats in the Southeast Asian waters</p> <p>(2) Issues in the region at the beginning of the study: Conservation of endangered marine animals in relation with fisheries is now matters of global concern. In the Southeast Asian region, six of seven species of sea turtle in the world are distributed. They are highly migratory and recognized as the endangered species. Successful conservation and enhancement of sea turtle resources requires the scientific evidences on their ecological aspects such as migratory routes, reproductive and feeding behavior and genetic homogeneity, and on the status of incidental catch and habitat reduction related to their mortality.</p>

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • To contribute for the formulation of a management plan of sea turtles inhabited in the ASEAN region with reference to the biological and ecological information; • To contribute for the formulation of management plans of fisheries that are suspected to have relationship with sea turtle habitats in space and time; • To develop and distribute mitigation measures for fisheries suitable for the ASEAN region to reduce incidental capture of sea turtles.
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3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Conservation and management of sea turtles</p> <ul style="list-style-type: none"> • To study management of sea turtle hatchery; • To conduct sea turtle tagging survey in major nesting beaches in the region; • To collect and compile information of current status of sea turtle nesting and conservation effort in the Southeast Asia; • To study and distribute the turtle excluder devices (TEDs) for shrimp trawl fishery as a mitigation measure to reduce sea turtle by catch.
<p>Step 2: Research for stock enhancement of sea turtles</p> <ul style="list-style-type: none"> • To conduct sea turtle tagging and satellite tracking study for nesting females in major nesting beaches to obtain ecological information of sea turtles such as migration route, foraging habitats, etc; • To conduct genetic analysis of nesting sea turtles to reveal subpopulation structures of sea turtles in the region; and • To study and distribute the usage of responsible fishing gear and practices, including C-hook instead of J-hook in several longline fisheries, gillnet fishing, etc. to reduce sea turtle by catch.
<p>Step 3: Research and management of sea turtles in foraging habitats in the Southeast Asian Water.</p> <ul style="list-style-type: none"> • To conduct sea turtle genetic, tagging, and satellite tracking study in their foraging habitats; • To compile ecological and biological information of sea turtles in the foraging habitats; • To conduct information collection of ecological parameters in pilot foraging habitats in the region; • To collect information of sea turtle poaching in the region; • To recognized fisheries which supposed to be closely related to sea turtle habitats in space and time; • To study and distribute effective mitigation measures to reduce sea turtle unintentional capture by artisanal fisheries in their foraging habitats; and • To formulate management plans for conservation of sea turtle populations in the region.

3.2.4 Activities in the current program:

<p>(1) Current position of the program: Step 3</p>
<p>(2) Program duration: 2010-2014</p>
<p>(3) Main activities</p> <ul style="list-style-type: none"> • Regional Meetings/Workshops to discuss on the implementation plans, progress, and outcomes of this program. • Field survey to collect ecological information of selected pilot foraging habitats of sea turtles. • Genetic study of foraging sea turtles to reveal sea turtle population structures in the region.

- Conventional tagging and satellite tracking studies of sea turtles to reveal sea turtle migration patterns and their nesting/foraging habitats in the region.
- Information collection of sea turtle poaching in the region.
- Research on interaction between sea turtles and fishing, including gillnet and hook-and-lines.
- Dissemination of the outcomes from research on interaction between sea turtles and fishing, including gillnet and hook-and-lines.
- Formulation of management plans for conservation of sea turtle populations in the region.

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> • The Regional Planning Meeting to discuss on the whole plan and to finalize implementation plan for 2010. • Field survey to collect ecological information of selected pilot foraging habitats of sea turtles. • Genetic study of foraging sea turtles to reveal sea turtle population structures in the region. • Conventional tagging and satellite tracking studies of sea turtles to reveal sea turtle migration patterns and their nesting/foraging habitats in the region. • Information collection of sea turtle poaching in the region. • Research on interaction between sea turtles and fishing, including gillnet and hook-and-lines. • Dissemination of the outcomes from research on interaction between sea turtles and fishing, including gillnet and hook-and-lines. • Formulation of management plans for conservation of sea turtle populations in the region. 	
(2) Main achievements till the end of 2010 (tentative)	
<ul style="list-style-type: none"> • The Regional Planning Workshop was held in Malaysia to discuss on the overall project proposal for 5-years from 2010 to 2014. • Ecological information of a selected pilot foraging habitat of sea turtles was collected at Brunei Bay. • Inconel tagging was continued at the focused nesting sites of sea turtles in participating Member Countries and tag recovery had been monitored. • Satellite telemetry studies were conducted for a leatherback turtle in Malaysia. • Research on interaction between sea turtles and fishing, including gillnet and hook-and-line, was continued. 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010 (tentative)	
Expected outcomes	Achievement rate (%)
• The Regional Planning Meeting	100%
• Field survey to collect ecological information of selected pilot foraging habitats of sea turtles	20%
• Genetic study of foraging sea turtles to reveal sea turtle population structures in the region	0%
• Conventional tagging and satellite tracking studies of sea turtles to reveal sea turtle migration patterns and their nesting/foraging habitats in the region	20%
• Information collection of sea turtle poaching	0%
• Research on interaction between sea turtles and fishing	20%
• Dissemination of the outcomes from research on interaction between sea turtles and fishing, including gillnet and hook-and-lines	20%
• Formulation of management plans for conservation of sea turtle populations in the region	0%

3.2.6 Evaluation of Program activities in 2010

The overall proposal was discussed and modified at the Regional Planning Workshop. Scientific survey of ecological parameters in a pilot foraging habitat of sea turtles (Brunei Bay) was conducted in July. The several ecological parameters were successfully collected or measured at the foraging habitat. However, we failed to catch sea turtles in Brunei Bay in July. Because of the difficulties and lack of specimens, genetic study has been delayed. We will try to collect sea turtles at a foraging site in 2011. Inconel-tagging and satellite telemetry are on schedule. Activity 3 (Interaction between sea turtles and fishing) made progress.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
Activity 1. Meeting/Workshop	Oct-Dec 2011	The Regional Progress Meeting will be held to discuss results of the 2010 survey in Brunei Bay and future research methodology in selected foraging habitats for sea turtles in ASEAN region. The meeting will be held in Kuching, Malaysia.
Activity 2. Research in Sea Turtle Foraging Populations	Jan-Dec 2011	Scientific survey of ecological parameters in a foraging habitat of sea turtles (the Derawan complex) will be conducted in July-October. During the survey for ecological parameters in a pilot foraging habitats, tissue samples from sea turtles inhabiting there will be collected for genetic study to reveal sea turtle subpopulation structures in the region. Inconel-tagging of sea turtles in the selected foraging and nesting ground will be carries out. The Regional Progress Meeting in 2011 will discuss information collection of sea turtle poaching.
Activity 3. Interaction between sea turtles and fishing	Jan-Dec 2011	<ol style="list-style-type: none"> 1. Continuation on the study for modification of responsible fishing gears to reduce the sea turtles by-catch 2. Promotion and awareness raising on the use of c-hook in hook-and-line fishing in member country

4.2 Expected Outcomes in the Year 2011

<ul style="list-style-type: none"> • The Regional Progress Meeting will be organized to discuss results of the 2010 survey in Brunei Bay and future research methodology in selected foraging habitats for sea turtles in ASEAN region, • Information on ecological parameters in a selected foraging habitat for sea turtles in ASEAN region will be collected, • Information on population structures of sea turtles in ASEAN region will be collected by genetic studies, • Information on migration and foraging grounds of sea turtles in ASEAN region will be collected by tagging studies, • Information collection on interaction between sea turtles and fishing through research/experiment and actual fishing trial.
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PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Improvement of information gathering system for IUU fishing related countermeasures in Southeast Asia (NEW)
Lead Department:	Training Department
Lead Country:	(to be decided)
Total Duration:	2011-2015
Proposed Budget:	69,000 USD

1. INTRODUCTION

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

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

This project provides and initiates set of activities focusing on information gathering on the illegal unreported and unregulated fishing (IUU-fishing) in coastal and marine fisheries for further improvement of the IUU-fishing related countermeasures for the Southeast Asian countries.

2. PROGRAM

2.1 Objectives

The objectives of this project are to:

- 1) Improving fisheries information gathering system/mechanism through various capacity building programs and activities;
- 2) Enhancing regional capacities in the aspects of information gathering to improve IUU-fishing related countermeasures in the region;
- 3) Improving better understanding and knowledge of fisheries in the region particularly on small-scale coastal and inland fisheries towards achieving sustainable fisheries development in the Southeast Asian Region;
- 4) Improving compilation of information and statistics on small-scale coastal and inland fisheries in the Southeast Asian; and
- 5) Facilitating better presentation and knowledge on status and condition of small-scale coastal and inland fisheries at national and regional level

2.2 Program Description

Improvement of Information Gathering

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

At the same time, there is the need to enhance various national capacities to collect national information for example in catch data information collection for proper management of the fisheries resources and to obtain qualitative data. In this connection, main objective of this program is to enhance the national capacities in order to be able to improve or produce quality and timely fishery information.

In order to support and promote sustainable development in capture fisheries sector, the program of activities under this category has the specific objectives to:

- 1) Review of information on initiatives and program of activities related to improvement of the IUU-fishing related countermeasures in the Southeast Asian region;
- 2) Improve accuracy and reliability of fisheries information to support improvement of fisheries regulations/measures including IUU-fishing related countermeasures; and
- 3) Develop a practical model for better understanding of the impact from IUU-fishing to fisheries resources.

Improvement of Information Gathering on Small-scale Coastal and Inland Fisheries

Fishery statistics and information is widely accepted as a tool to provide a basis and being crucial to the determination of national fisheries policies, the formulation of national management frameworks and actions or even as a basis for understanding the status and condition of fisheries resources. The need for accurate, timely and reliable statistics and information for the formulation and evaluation of fishery programs and policies has inevitable expanded manifold for development and management purpose. However, national systems of fishery statistics and information require improvement and strengthening in response to the change and dynamics of the sector as well as emerging needs and requirements for effective management of the sector.

The Code of Conduct for Responsible Fisheries (CCRF) adopted in 1995 and supplemented by the Strategies for Improving Information on Status and Trend of Fisheries (STF) and Aquaculture (STA), provides norms and guidelines in achieving responsible fisheries and the role of fishery data and information. In the ASEAN region, where the Member Countries are working towards realization of an ASEAN Community, fisheries are regarded as an important priority sector that will play an important role in such realization. Supporting data and information in assessing the sectoral integration is of crucial importance.

With the view to support the ASEAN Member States in sustainable development of fisheries, ASEAN-SEAFDEC in collaboration with FAO and hosted by Thai Department of Fisheries organized the Millennium Conference. The main outputs of the Conference were the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region, which are regarded as regional policy framework and priority actions in achieving sustainable fisheries. Considering the role and contribution of fishery statistics and information, the Resolution indicates the need for *“Strengthening of fishery statistics and maximizing their use for fisheries*

planning and management, as well as development of standard definitions and classifications to facilitate regional fishery statistics and information exchanges”.

In order to address the above requirement, ASEAN Member Countries in collaboration with international/regional organizations such as SEAFDEC and FAO have taken initiatives at both national and regional levels to strengthen their national fishery statistical and information systems as part of strategies in achieving sustainable development of fisheries.

SEAFDEC plays a prominent role in fishery statistics in Southeast Asia and has been assembling regional fishery data and information for many decades. Under the ASEAN-SEAFDEC FCG/ASSP program on Fishery Statistics and Information supported by the Japanese Trust Fund (2007-2010), the program achievements were accomplished with the development of Regional Framework for Fishery Statistics of Southeast Asia, comprising standard definitions, and classification of fishery statistics and information; Streamlined Reporting of Fishery Statistics from the Member Countries to FAO and SEAFDEC; and development of National Status and Trends (STF) of Fisheries and Aquaculture to enhance capacity of the Member Countries in development, integration, and maximizing usage of data and information available for development planning and management of fisheries.

Over the past decade, progress in improving the quality of statistics and information supporting sustainable fisheries has been observed. However, 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 over the past nine years (2002-2010) could not fulfill in detail for all sub-sectors of fisheries. This sub-project is then formulated to continue supporting Member Countries in response to the directive made by SEAFDEC Council at its 42nd Meeting held in April 2010 in promoting sustainable fisheries development in the Southeast Asian region and specifically in addressing the issues that threaten the sustainability of fisheries in the region through enhancing its collaboration with the Member Countries in the compilation of fisheries information and statistics on small-scale coastal and inland fisheries, and emphasizing on human resource development (HRD) and capacity building.

The project activity will build on top from the past achievement and develop materials for capacity building through compilation of available existing tools and methodologies for maximizing its utilization for planning and management of fisheries at national and regional levels while maintaining the linkage and cooperation in the harmonization of norms/standards definitions and classifications of fishery statistics and information at regional and international levels.

Improve Information Gathering of Tuna Catch Data

The five countries in Southeast Asia, namely Indonesia, Malaysia, Philippines, Thailand, and Vietnam contributed more than 87% of the world total tuna production in 2002 (Purwito, FAO Report on Statistical Area 71). In addition, Indonesia and Philippines are the main tuna countries in the Western Central Pacific. There is currently increasingly international concern on IUU-fishing activities including IUU-fishing in tuna fisheries. This activity is developed to support the Member Countries to improve information gathering and collection to be able to mitigate problems /impact from IUU-fishing in tuna fisheries.

Furthermore, for sustainable management and development of tuna fisheries in the Southeast Asian region, the program of activities under this category is developed with the aim to build various capacities of the Member Countries to improve information collection of tuna catch data. It is envisaged that the countries could obtain more reliable and timely data for proper management of the tuna fisheries in their respective countries. Activities to be implemented under

this category include improvement of information collection at-sea fishing activities, landing sites, and processing plants.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

(no activities implemented in 2010)

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

<p>(1) Theme: Improvement of IUU-fishing related countermeasures in the Southeast Asian Region through improvement of information gathering system/mechanism</p>
<p>(2) Issues in the region at the beginning of the study:</p> <ul style="list-style-type: none"> • Poor fisheries information gathering, particular for management of fishing capacity (boats, people, gears, standard and safety onboard fishing boats, illegal fishing gear, illegal fishing operation, etc.) • Various actions needed for combating IUU-fishing in response to: resources declination; poverty at local/community level; ineffective fishing regulation/countermeasures; weak in-country coordination; IUU-fishing activities frequently occurred in the neighboring countries. • Insufficient skill in transferring science-based findings into policy actions. • Insufficient knowledge and understanding of information collection and compilation of information and statistics on coastal marine and inland fisheries of the ASEAN Member Countries, particularly CLMV countries.

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • Establishment of an effective information gathering system/mechanism to improve IUU-fishing related counter measures in the Southeast Asian region • Enhancement of regional and national capacities for science-based policy development, particularly for improvement of IUU-fishing related countermeasures in the Southeast Asian region • Support establishment of inventory/database system for monitoring and recording movement of fishing activities in the Southeast Asian region through the collection of best practices • Enhancement of collaboration between regional and national initiatives related to combat IUU-fishing • Building capacity to fisheries officials on tools and methodologies for collection and compilation of information and statistics on small-scale coastal and inland fisheries.

3.2.3 “Steps” toward achieving final goals:

<p>Step 1: Identify priority issues and gaps to improve information gathering to combat IUU-fishing in the Southeast Asian region</p> <ul style="list-style-type: none"> • Organization of the project planning meeting • Draft planning for developing a practical model to support the mitigation of the impact from IUU-fishing • Draft planning for the feasibility study on validating the common format for obtaining more reliable information on fishing activities • Organization of the experts meeting on planning and design for database system • Organization of the capacity building program for fisheries officials responsible for collection and compilation of information and statistics on coastal marine and inland fisheries, in CLMV countries.
<p>Step 2: Carry out regional and national capacities building program for improvement of information gathering to improve IUU-fishing countermeasures in the Southeast Asian region</p> <ul style="list-style-type: none"> • On-the-job capacities building • Capacity building for improvement of accuracy of catch data for Member Countries • Packaging the documents/materials/media to compile best practices for improvement of IUU-fishing countermeasures.

Step 3: Setup regional inventory/database for monitoring IUU-fishing activities

- Information dissemination on the improved system for the information gathering
- Maintain the established regional inventory/database for monitoring/coordinating with other relevant agencies on IUU-fishing activities.

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1
(2) Project duration: 2011-2015
(3) Main activities: <ul style="list-style-type: none"> • Regional/national technical consultations/meetings • Capacity building programs for improvement of information gathering • Compilation/development and promotion of best practices for improvement of information gathering • Capacity building program for science-based policy development • Information sharing and dissemination of major outputs from the project implementations.

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
(2) Main achievements till the end of 2010	
(3) Outcomes during the program period and expected achievement rate till the end of 2011	
Expected outcome	Achievement rate (%)
1. Establishment of an effective information gathering system/mechanism to improve IUU-fishing related countermeasures in the Southeast Asian region	30%
2. Enhance regional and national capacities for science-based policy development, particularly for improvement of IUU-fishing related countermeasures in the Southeast Asian region	30%
3. Establishment of inventory/database system for monitoring and recording movement of fishing activities in the Southeast Asian region through the collection of best practices	30%
4. Human capacity building to fisheries officials on tools and methodologies for collection and compilation of information and statistics on small-scale and inland fisheries	30%

3.2.6 Evaluation of Program activities in 2010

(no activity in 2010)

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1. Improve information gathering	Mar – Dec	1) Organization of the project planning meeting 2) Organization of work-based capacity building program 3) Organization of regional capacity building program on research/science-based policy development 4) Setup the plan and design for: <ul style="list-style-type: none"> • Model for better understanding of the impact from IUU-fishing • Feasibility study on validating common format of fishing record

2. Improve information gathering on small-scale coastal and inland fisheries	Jan – July	<ol style="list-style-type: none"> 1) Organization of capacity building program for government officials responsible for collection and compilation of information and statistics on coastal, marine, and inland fisheries, Lao PDR. 2) Organization of the national workshop to improve compilation of information and statistics on small-scale coastal and inland fisheries, selected one of CLMV countries.
3. Improve information gathering on tuna catch data	Mar – Dec	<ol style="list-style-type: none"> 1) Organization of the 1st working group meeting 2) Organization of national capacity building program for tuna fisheries information gathering; and species identification at tuna canneries. 3) Organization of expert meeting on by-catch in tuna fisheries 4) Organization of database working group meeting for designing the database system for tuna fisheries in SEA region.

4.2 Expected Outcomes in the Year 2011

Various important capacities of the fisheries officials to combat IUU-fishing will be built through the regional/national program of activities (as appropriate). It is envisaged that the project could obtain detail plan for improvement of information gathering at all levels (community/local, national, and regional). Common/harmonized of the fishing record will be regionally discussed. Information collection and compilation for statistics on coastal, marine, and inland fisheries will be improved through the organization of the national workshop. Furthermore, the ways to improve information gathering on tuna catch data of the Member Countries will also be discussed.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Promotion of Fishing License, Boats Registration System and Port State Measures
Lead Department:	TD and MFRDMD
Lead Country:	TBD
Total Duration:	2011- 2015
Proposed Budget:	USD 115,000

1. INTRODUCTION

Illegal, Unreported and Unregulated (IUU) fishing can take place in all capture fisheries, whether within national jurisdictions or in the high seas. Efforts to conserve and manage fish stocks are undermined by IUU fishing and can lead to the collapse of fisheries or can seriously impair efforts to rebuild fish stocks that have already been depleted. This may lead to the loss of both short- and long-term social and economic opportunities and could have negative impacts on food security.

Every country in the Southeast Asian region and regional efforts are now focusing on the promotion of sustainable fisheries management and countermeasures to IUU fishing. This is also in cognizant with the role of fishing management schemes such as fishing license, boats registration system, port state control, and Monitoring, Control and Surveillance (MCS) in the adoption of effective measures to promote the sustainable use and the long-term conservation of marine living resources.

Therefore, the promotion on fishing license, boats registration and port state measures through MCS to combat IUU fishing should be in harmony with the structure of fisheries in the region. The experiences of the countries in the region in the implementation activities to combat IUU fishing should be shared and learned in order to strengthen the regional efforts and network.

2. PROGRAM

2.1 Objectives

- 1) To promote fishing license, boats registration system and port state measures to combat IUU fishing
- 2) To develop regional guidelines on license, boats registration system and port state measures in Southeast Asia
- 3) To promote MCS management to combat IUU fishing for sustainable fisheries in the region
- 4) To develop regional guideline to prevent IUU fishing and its products from being exported
- 5) To assist the SEAFDEC Member Countries in application and implementation of measures to combat IUU fishing

2.2 Program Description

Based on the current situation and the abovementioned concerns, SEAFDEC wishes to propose the technical program to support the Member Countries in promoting fishing license, boat registration system and port state measures to combat IUU fishing with the following proposed activities; 1) Promotion of fishing license, boats registration system and port state measures to combat IUU fishing, 2) Promotion of Monitoring, Control and Surveillance (MCS) to combat IUU fishing in Southeast Asia, 3) Preventing export of IUU fishing product.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

(no activities implemented in 2010)

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

Activity 1: Promotion of fishing license, boats registration system and port state measures to combat IUU fishing (Lead by TD)

Sub-activity 1.1: Preparatory process of the project activities

1.1.1 Literature review and documentary analysis

An intensified literature review and documentary analysis will be conducted through a study of the existing reports and documents that include the works of Sida, FAO/APFIC, ASEAN-RPOA and those of the Member Countries on fishing license and boat registration including port state measures. This is aimed at analyzing the present scenario which could be used as basis for the formulation of the necessary activities without duplication of efforts. It is also envisaged that in the analysis, the specifics to be designed under the project activities should be complementary and coordinated with the various relevant projects being or had been implemented in the region.

1.1.2 Regional/international coordination and cooperation

Regional/international coordination and cooperation will be enhanced through discussions and consultation with the Member Countries and other international organizations in order to seek their cooperation and support during the implementation of the activities of the project. Participation of the project staff in relevant regional/international meetings and workshops to exchange information will also be part of this activity. (The regional coordination will be also conducted through the mobilization of the WGRFP system develop in SEAFDEC)

1.1.3 Identification and establishment of core expert groups

Follow up activities on the identification of regional/international experts will be conducted during the activities on the regional/international coordination and cooperation. The expert groups will be established to serve as the workforce for the preparation and development of the regional guidelines on fishing license and boat registration and other related port state measures.

Sub-activity 1.2: Development of regional guidelines on fishing license and boat registration system and other related port state measures in Southeast Asia

1.2.1 Regional core expert meeting

After the experts/focal point groups are established from Activity 1, SEAFDEC will invite the regional core experts on fishing license and boat registration from the SEAFDEC Member Countries and other organizations/institutions to discuss and develop the draft regional guidelines through sharing and exchange of related information and experiences among the experts. The technical components of the regional guidelines may include in-country coordination on fishing boat registration, improved registration for licensing, appropriate concept of zoning, responsible government units either at the central and provincial levels through appropriate policy on the delegation of management authorities, licensing methodologies, documentation and enforcement measures including appropriate MCS systems. A seven-day session would be necessary to formulate the first draft of the regional guidelines.

Sub-activity 1.3: Production of information and promotional materials

Production on information and promotional materials on fishing license, boat registration system and port state measures to combat IUU fishing will be carried out during the implementation of the project activities. Finally, the regional guidelines will be produced and disseminated to the SEAFDEC Member Countries and worldwide.

Activity 2: Promotion of Monitoring, Control and Surveillance (MCS) to combat IUU fishing in Southeast Asia (Lead by TD)

Sub-activity 2.1: Regional workshop on review and improvement of Monitoring, Control and Surveillance system (MCS) in Southeast Asia

The regional workshop will elaborate on the common understanding of the MCS package, design consideration and operation procedures which could be effective to combat IUU fishing in the Southeast Asian region. Representatives of the Member Countries who are focal points and external resource persons will be invited for the workshop. Review of MCS experience of each country will be carried out and identify the lessons that can be applied in the region. Moreover, brainstorming of appropriate MCS tools for fishery management to combat IUU will be conducted. The regional MCS network will also be established to promote and share information through coordination of regional activities that support the promotion of responsible fishing practices.

Sub-activity 2.2: National training/workshop on the promotion of Monitoring, Control and Surveillance system (MCS) to combat IUU fishing

The national training and workshops will be conducted in collaboration with the respective SEAFDEC Member Countries as follow up activities of the regional workshop on MCS. Representatives from the government agencies, stakeholders and others sectors concerned will be invited to participate in this activity. The national training and workshops are envisaged to promote knowledge and understanding of the fishing industry about MCS activities, and also to develop appropriate observer programs. Moreover, the workshops would also address various concerns including the requirements of the fishing industry to adhere to inspection regimes and carry observer onboard when required and to build up awareness on the effectiveness of the use of MCS tools for sustainable fisheries to combat IUU fishing. Implementation of MCS in the countries will be conducted through case studies to assess the level of its application and adoption in the country. This activity is also expected to establish the network and voluntary groups to promote MCS to combat IUU fishing in the respective countries.

Activity 3: Preventing export of IUU fishing product (Lead by MFRDMD)

Sub-activity 3.1: Gathering information regarding export of fisheries products from ASEAN Member countries

Information on the present status of export of fisheries products from SEAFDEC Member Countries will be collected from focal persons, the information needed will be as follows :-

- a. Type of fishery products *e.g.* Fish , prawns etc.
- b. Nature of products *e.g.* dried , fresh fillet, fresh whole fish, fish-ball, fish-cake
- c. Weight or volume per month /year , Value of exports
- d. Importing country, port of entry , mode of transportation

Sub-activity 3.2: Preparation of questionnaires by MFRDMD

The questionnaires will be prepared by MFRDMD.

Sub-activity 3.3: Filling – up of questionnaires

The questionnaires will be fill up by officials and stakeholders from SEAFDEC Member Countries

Sub-activity 3.4: Regional workshop on export of fishery products

A workshop for information gathering regarding export of fisheries products and recommendation on the type of information required for development of a regional guidelines.

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1. Promotion of fishing license, boats registration system and port state measures to combat IUU fishing (TD)		
1.1 Preparatory process of the project activities		
1.1.1 Literature review and documentary analysis	Jan-Dec 11	
1.1.2 Regional/international coordination and cooperation	Jul-Dec 11	
1.1.3 Identification and establishment of the core expert groups	Jul-Dec 11	
1.2 Development of regional guidelines on fishing license, boat registration system and other related port state measures in Southeast Asia		
1.2.1 Regional core experts Meeting	Aug 11	
1.3 Production of information and promotional materials	Jan-Dec 11	
2. Promotion of Monitoring, Control and Surveillance (MCS) to combat IUU fishing in Southeast Asia (TD)		
2.1 Regional workshop on promotion of MCS to combat IUU fishing in the Southeast Asian region	Aug 11	
2.2 National training/workshop on MCS to combat IUU fishing for sustainable fisheries development	Sep 11	
3. Preventing export of IUU fishing products (MFRDMD)		
3.1 Gathering information regarding export of fisheries products from ASEAN Member Countries	Jan-Dec 11	
3.2 Preparation of questionnaires by MFRDMD	Jan-Dec 11	
3.3 Filling-up of questionnaires	Jan-Dec 11	
3.4 Regional workshop on export of fishery products	Nov 11	

4.2 Expected Outcomes in the Year 2011

- The review and documentary on fishing license, boat registration system and other related port state measures in the region was analyzed and prepared as a process of the project activities
- The first draft of regional guidelines on fishing license and boats registration in Southeast Asia developed and discussed.
- Cooperation/collaboration with Member Countries and other organizations/institutions enhanced.
- The target groups commonly understood and are involved as voluntary groups in MCS to combat IUU fishing for sustainable fisheries in the region.
- Each country in the region has applied and implemented the activities to combat IUU fishing with assistance from SEAFDEC.
- The focal point in each country will be the key person to promote MCS to combat IUU fishing for sustainable fisheries.
- Information gathering and sharing regarding export of fisheries products from SEAFDEC Member Countries
- Recommendation on information required for development of regional guideline on prevent IUU fishing and its products from being exported

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Human Resource Development for Sustainable Fisheries
Lead Department:	TD
Total Duration:	(2011- 2015)
Proposed Budget:	USD 95,000

1. INTRODUCTION

During the past decade the incidence of Illegal, unreported and unregulated (IUU) fishing has grown at an alarming rate within the Convention Area and adjacent areas. IUU fishing depletes fish stocks, destroys marine habitats, distorts competition, puts honest fishers at an unfair disadvantage, and weakens coastal communities, particularly in developing countries. Furthermore, IUU fishing is a lead to the loss of both short and long term social and economic opportunities and could have negative impact on food security. Every country in the Southeast Asian region is always confronted by increasing pressure on their fisheries resources from illegal fishing. In many cases, IUU operation is more related to the lack of Monitoring Control and Surveillance (MCS) management including lack of knowledge and understanding about IUU fishing of government agency, stakeholder, fisherman, and others sectors concern.

Moreover, in this regard, many fisheries management plans and methods were used in order to solve the problems in each country. However, those plans were not seem to be much perfect because they overlooked the aspect of safety at sea standard, since fishing has always been among the most dangerous occupations pursued by man. The main reason for fishing being so dangerous is that human beings are terrestrial. To humans, being immersed in water constitutes lethal danger. Fishermen depend on their vessels for their survival. If the vessel is lost, it is probable that some or all of the crew will lose their lives. In order to achieve for the sustainable fisheries development, not only the human well being but also their life secure aspects are needed to be taking into the management plan.

Capacity-building has been widely recognized as the important tools/methods for human resource development for understanding and awareness building. This project proposes to work with focal point in Member Countries to introduce, support and expand the knowledge and additional useful information/technologies for human capacity-building in the region through the training process. The training programs will enable countries and training providers to draw on rapid and sustainable workforce expansion: normative guidance, national planning, local technical expertise and assistance.

2. PROGRAM

2.1 Objectives

- 1) The requirements and criteria of knowledge for conducting the relevant regional HRD programs in the future will be identified and prioritized.
- 2) The IUU fishing in the region will be reduced through the use of HRD and awareness building program.
- 3) The safety at sea standard will be improved in the Southeast Asia Region

2.2 Program Description

The project will be emphasized to develop human capacity of SEAFDEC Member Countries to combat IUU fishing for sustainable fishery in the region. The regional consultation on HRD

program in Southeast Asia will be organized to identification/prioritize on the requirement criteria of knowledge for conducting the regional HRD program in the future. Furthermore, the regional training programs will be organized and focused on fishery management, safety at sea and other which supports to combat IUU fishing. The training tool kits and promotion materials for each regional training program will be produced to build up human capacity and awareness throughout the region. The project is designed to implement activities as follows;

Activity 1: Regional Consultation Workshop on HRD programs in Southeast Asia

Activity 2: Human Resource Development and Human Awareness Building Programs

- Sub-activity 2.1:** Regional Training Course on the Reducing of IUU fishing through Fisheries Management
- Sub-activity 2.2:** Regional Training Course on Fisheries Management and Extension Methodology
- Sub-activity 2.3:** Regional Training Course on Ecosystem Effects of Fishing in Southeast Asia
- Sub-activity 2.4:** Regional Training Course on Effective MCS System
- Sub-activity 2.5:** Regional Training for the Trainers Program on Fishing Boat Operations and safety standard
- Sub-activity 2.6:** National Training/Workshop on Fishing Boat Operations and Safety Standard in the Selected Countries.
- Sub-activity 2.7:** The Post Regional Workshop on the Program Activities Evaluation and Regional Follow up Activity on Fishing Boat Operations and Safety Standard through the HRD and Promotion Materials Programs (will be merged with the Activity 1)

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

(no activities implemented in 2010)

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

Activity 1: Regional Consultation Workshop on HRD programs in Southeast Asia

The regional consultation on the HRD programs in Southeast Asia will be held at SEAFDEC/TD, for duration of 3 days in 2011. The workshop agenda will focus mainly on three activities: Identification on the need and requirement on HRD programs, title and area of knowledge in Southeast Asia, as well as to discuss on the appropriate counter measures and other management tools which can be use to combat IUU fishing through HRD and awareness raising programs in Southeast Asia. Including the further collaboration with others educational institutions for HRD and awareness building programs. Two representatives from each Member Countries will be invited to the Consultation. The target participants are the national coordinators or government official from the central level who is responsible for the extension work and another one should be the person who involve in the human capacity building or awareness building programs officers.

Activity 2: Human Resource Development and Human Awareness Building Programs

Sub-activity 2.1: Regional Training Course on the Reducing of IUU fishing through Fisheries Management

The regional training on the reducing of IUU fishing through fisheries management counter measure will be conducted at SEAFDEC/TD, for about two weeks. Two representatives from each Member Countries will be invited to participate in the training course. The training contents

will be mainly deal with the characteristic of fishery resources, the IUU fishing activities, the effect of IUU fishing and its problems to the sustainable fisheries approaches as well as the options in combating IUU fishing by using different counter measures such as Monitoring Control and Surveillance (MCS), Port State Management (PSM), Integrated Fisheries Management (IFM) and other management tools. The presentation from each country will be required in order to illustrate the situation and problems of IUU fishing in their countries, their currently solution and methods used as well as the lesson learned on the fishery management tools in combating the IUU fishing in each country. The course will also include the subjects of the appropriate extension methods to work with stakeholders and fishers in order to build up their awareness. The extension/promotion materials production techniques and methods will be also introduced to the participants. Two representatives from each Member Countries will be invited to the training course. The target participants are the fisheries extension officers, fisheries officers, administrators or others exposed to the fishing gears and technologies and related in administrative of human planning capacity.

The course evaluation program will be designed to evaluate base on the goals, process and outcomes of the training program. The methods will be used of the questionnaires, observation, interview and active research to the participants and the resource persons. The information will be collect/sort as the quantitative and qualitative types then the sorted formation will be further analyzed, interpreted and used for the course report

Sub-activity 2.2: Regional Training Course on Fisheries Management and Extension Methodology

The regional training course will be conducted at SEAFDEC/TD for about two weeks. Two representatives from each Member Countries will be invited to the training course. The target participants are the fisheries extension officers, fisheries officers or others exposed to fisheries management. The course focuses on modern principles and concepts of 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 some existing pilot projects; practical involvement and presentation of extension media. The course evaluation program will be designed to evaluate base on the goals, process and outcomes of the training program. The methods will be used of the questionnaires, observation, interview and active research to the participants and the resource persons. The information will be collect/sort as the quantitative and qualitative types then the sorted formation will be further analyzed, interpreted and used for the course report.

Sub-activity 2.3: Regional Training Course on Ecosystem Effects of Fishing in Southeast Asia

The course will be conducted at SEAFDEC/TD, for the approximately duration of 2 weeks. Two representatives from each Member Countries will be invited to the training course. The target participants are the fisheries managers and fisheries officers. This course aims to build upon the current issues related to the ecosystem effects of fishing. Participants will gain an understanding of the legal, policy, administrative and management implications of ecosystem function and assessment in relation to the present issues facing fisheries in the ASEAN region. The course will be designed to be interactive among the course participants and the course resource persons to having ample opportunity to discuss concepts and issues raised by presenters. The course presenters are expected to present the case studies, introduce related promote concepts and method for ecosystem management. The lesson learned and limitation from each case study will be used to stimulate the discussion.

Sub-activity 2.4: Regional Training Course on Effective MCS System

The regional training course will be conducted at SEAFDEC/TD for about 2 weeks. Two representatives from each Member Countries will be invited to the training course. The target participants are the fisheries extension officers, fisheries officers or others exposed to fisheries management. The training course will focus on the common understanding on the impact of IUU fishing as well as the MCS system and operation procedures which can be use and apply to combat the IUU fishing in each country of this region.

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1.Regional Consultation on HRD Programs in Southeast Asia	Mar 11	
2.Human Resource Development to combat IUU fishing		
2.1 Regional Training Course on the Reducing IUU fishing through fisheries management	May 11	
2.2 Regional Training Course on Fisheries Management and Extension Methodology	Aug 11	
2.3 Regional Training Course on Ecosystem Effect of fishing in Southeast Asia	Sep 11	
2.4 Regional Training Course on effective MCS system	Nov 11	

4.2 Expected Outcomes in the Year 2011

- The identification/prioritize on the requirement criteria of knowledge for conducting the regional HRD program in the future;
- The collaboration with other education institutions for HRD and awareness building program;
- The government agency, stakeholder and others sectors concern will increase their common understanding and awareness building for sustainable fisheries;
- The focal points of SEAFDEC Member Countries who participate in the training course can be a trainer in their country; and
- Production of the training tool kits and promotion materials for sustainable fisheries and IUU fishing related countermeasures will be used for further transfer the knowledge and information to the project target groups.

PROGRAM DOCUMENT

Program Category:	Program under the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) Mechanism
Program Title:	Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing Related Countermeasures
Lead Department:	SEAFDEC Secretariat
Lead Country:	TBD
Total Duration:	2011-2015
Proposed Budget:	90,000 USD (tentative)

1. INTRODUCTION

SEAFDEC have been working on the promotion of Sustainable Fisheries Development in the Southeast Asian Region for more than 4 decades since the SEAFDEC was established. The SEAFDEC program frameworks to support Member Countries has been significantly changed in 1998 when SEAFDEC adopted the Resolution on SEAFDEC Strategic plans at the 30th Meeting of the SEAFDEC Council and more clear after the new millennium in 2001 when ASEAN-SEAFDEC adopted the Resolution and Plan of Action on Sustainable Fisheries for Food Security in the ASEAN Region” as a policy guidelines for SEAFDEC and Member Countries. Taking into account on the IUU fishing related countermeasures happened at the global and regional level, requires all international, regional organization and country in managing and promoting the sustainable fisheries development including combating IUU fishing. But many countries are still facing IUU fishing related countermeasure including the affect to fish trade at international scale. Noted that SEAFDEC as an IGO in the Southeast Asian plays also an important role in promoting the sustainable fisheries development and assisting the development of the IUU fishing related countermeasures. One possibility for SEAFDEC to support on these tasks is to strengthen SEAFDEC network and developing the coordination mechanism between SEAFDEC and others international organizations and among SEAFDEC Member Countries. To keep momentum of Southeast Asia Interest and updated the International instruments from not only FAO but other international for a related to fisheries aspects, the coordination mechanism is required under this project. Coordination with all SEAFDEC Member Countries can be made through establishment of the regional fisheries policy network (RFPN), by strengthening the existing RFPN mechanism. The is the coordinating functions between country and SEAFDEC, their scopes of work will not limited to the specific issues of the main program, but it would cover fisheries related issues concerning the sustainable fishery and food security that guided in the 2001 and 2011 ASEAN-SEAFDEC Resolution and Plan of Actions. As mentioned earlier, this program is only one of the four in the component “Promotion on Sustainable Fisheries and IUU Fishing Related Countermeasures in the Southeast Asia” One of the activity is the monitoring and evaluation of this component should be strengthened in order to ensure that such programs/activities continue to address the needs of region as well as member country. The monitoring and evaluating process of each program will be developed and introduced in the proposal.

2. PROGRAM

2.1 Objectives

The overall objectives of the projects are as follows:

- 1) To strengthen SEAFDEC network through enhancing the coordination mechanism among the International organizations and Member Countries for better understanding on the situations related to development of sustainable fisheries at regional and global levels,
- 2) To strengthen regional coordination and cooperation among SEAFDEC and institutions/agencies related to fisheries, environment and CITES to address the SEAFDEC/ASEAN positions,

- 3) To strengthen the regional fisheries policy network (RFPN) as coordinating functions among SEAFDEC and ASEAN Member Countries for specific tasks on fisheries and trade related issues,
- 4) To monitor and evaluate the overall SEAFDEC programs under the Japanese Trust Funds to ensure all programs meet the requirement of ASEAN members and address the regional policy management on sustainable fisheries development,
- 5) To publicize the ASEAN-SEAFDEC initiatives in addressing issues and concerns related to sustainable development of fisheries.

2.2 Program Description

To address the threats posed by IUU fishing to the Sustainable of Fisheries in the Southeast Asian, SEAFDEC proposing a program on the Promotion of Sustainable Fisheries and IUU Fishing Related Countermeasures in the Southeast Asia. The main program component includes of 4 project areas *i.e.* 1) Information Collection for Enhancing governance in fishery management, 2) Promotion of boat registration, fishing licensing and port state measures, 3) Human Resources Development fish sustainable fisheries and, 4) Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing related Countermeasures. This project proposal focuses on the Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing related Countermeasures. To strengthen the SEAFDEC network and seek cooperation from Member Countries while ensuring the activities meet the Member Countries requirements, therefore the project is designed to implement three main activities as follows.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

(no activities implemented in 2010)

3.2 Evaluation of the Program Outcomes <in General>

3.2.1 Theme and issues:

(1) Theme: SEAFDEC network for IUU Fishing related Countermeasures

(2) Issues in the region at the beginning of the study:
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- | |
|---|
| <ul style="list-style-type: none"> • Cooperation and clear regional coordinated positions among SEAFDEC Member Countries in order to work together for sustainable fisheries development in the region and to meet the international requirements of the IUU fishing related countermeasures |
|---|

3.2.2 Expected final goals of the program:

- | |
|--|
| <ul style="list-style-type: none"> • Effective SEAFDEC network with the International/regional organizations and arrangements to development of sustainable fisheries at regional and global levels. • Effective coordination mechanism among SEAFDEC and its Member Countries for Regional task force and assessment to support in developing the regional coordinated positions and to ensure sustainable fisheries and food security in the region • Strengthening the Regional Fishery Policy Network • Monitoring and evaluation procedures for the overall SEAFDEC programs to ensure all programs meet the requirement of ASEAN members and address the regional policy management on sustainable fisheries development. • Publicize the ASEAN-SEAFDEC initiatives in addressing issues and concerns related to sustainable development of fisheries |
|--|

3.2.3 “Steps” toward achieving final goals:

<p>Enhancing the International and Regional Coordination</p> <p>Step 1: Identify and in-depth study on the specific task force on fisheries and environment related tasks which are linked to IUU fishing related countermeasures</p> <p>Step 2: Addressing the regional coordinated positions or views at the International/ regional for a to ensure Southeast Asian countries play an important role on promotion of sustainable fisheries and food security and combating IUU fishing</p> <p>Step 3: Promote the international and regional coordination and information sharing in the Southeast Asian region</p>
<p>Strengthening the RFPN</p> <p>Step 1: Setup the ASEAN RFPN at SEAFDEC Secretariat</p> <p>Step 2: Identify the task force and effective coordination mechanism</p> <p>Step 3: Collective activities for national inputs to assess the regional views on the sustainable fisheries and IUU fishing related countermeasures</p> <p>Step 4: Develop the Virtual RFPN coordination mechanism for long term implementation</p> <p>Step 5: Information dissemination</p>
<p>Monitoring and Evaluation</p> <p>Step 1: Develop the monitoring form</p> <p>Step 2: Identify the standard criteria, indicators for the evaluation process of the program</p> <p>Step 3: Conduct the evaluation meeting</p> <p>Step 4: Communicate with Member Countries through evaluating process</p> <p>Step 5: Update the outcomes/ progress of the evaluation of all program concerned</p> <p>Step 6: Information dissemination on the outcomes</p>
<p>Fish for the People - to publicize the SEAFDEC/ASEAN initiatives in addressing issues and concerns related to sustainable development of fisheries in the region</p> <p>Step 1: Collation of issues relevant to the SEAFDEC thrusts, with emphasis on their importance and regional implications; and analysis of the outcomes from technical meetings coordinated by SEAFDEC including their policy implications</p> <p>Step 2: Editing of relevant contributed articles and transforming these into easy-reading style to fit the capabilities and needs of the varied target audience</p> <p>Step 3: Consultation with authors and contributors on the articles initially edited for further comments and revision, as the case may be</p> <p>Step 4: Collection of relevant photographs corresponding to the articles</p> <p>Step 5: Putting the papers into proper layout by the Production Team at SEAFDEC Secretariat</p> <p>Step 6: Soliciting further comments from the editors and authors</p> <p>Step 7: Printing of the Special Publication</p> <p>Step 8: Dissemination of the Special Publication</p>

3.2.4 Activities in the current program:

(1) Current position of the program:	Developing process of the project proposal
(2) Program duration:	2011-2015
(3) Main activities:	Developing the proposal for consideration by the Japanese Trust fund before submission to be scrutinized at the 33 rd meeting SEAFDEC program committee

4. PROPOSED ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Activity/Sub-activity	2011											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Enhancing Coordination/ Communication Mechanism with International/ regional Organizations												
1.1) Strengthening coordination mechanism for international cooperation	X	X	X				X	X	X			

1.2) Strengthening coordination mechanism for regional/ country cooperation				X	X	X	X					
1.3) Facilitating intra-regional exchange of expertise and information								X	X	X	X	
2. Strengthening Regional Fisheries Policy Network (RFPN)												
2.1) Strengthening Regional Fisheries Policy Network (RFPN)	X	X	X	X	X	X	X	X	X	X	X	X
2.2) Developing and strengthening other mechanisms to enhance the country coordination	X	X	X									
3. Evaluation of the project activities for sustainable fisheries and IUU fishing related countermeasures												
3.1) Monitoring the project activities	X	X	X	X	X	X	X	X	X	X	X	
3.2) Evaluation process											X	X
3.3) Production and Dissemination of the Special Publication	X	X	X	X	X	X	X	X	X	X	X	X

4.2 Expected Outcomes in the Year 2011

- Establishing Regional Fisheries Policy Network (RFPN)
- Coordination mechanism for enhancing the Regional Fisheries Policy Network
- Identify the standard and criteria (performance measures) in consultation with Member Countries, SEAFDEC departments and third party
- Update/progress of the program package for 2011
- Program evaluation framework
- Enhancing coordination with the Regional Fishery Body Secretariats Network and others relevant international organizations
- Others

LIST OF NON-FUNDED PROGRAMS 2010-2011

Project Title	Responsible Departments	2010	2011
1. The Use of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region	MFRDMD	N	N
2. Development of Integrated Inland Fisheries Management in ASEAN Countries	MFRDMD	N	N
3. Utilization of Freshwater Fish in ASEAN Member Countries	MFRDMD	N	Y ¹⁴
4. Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty ¹⁵	TD/SEC	N	N

¹⁴ The Program will be supported by the Government of Singapore starting from 2011 for three years. The Program activities will target only some Member Countries due to limitation of the budget.

¹⁵ This program will be linked with the pipeline project on “Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management” preparing by SEC

Annex 6

PROGRAM OF ACTIVITY UNDER OTHER PROGRAMS FOR THE YEAR 2010-2011

Programs	Responsible Department	2010	2011
1. Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program (<i>Appendix 1</i>)	TD	Y	Y
2. Promotion of Inland Small-scale Fisheries Management through Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Approaches (<i>Appendix 2</i>)	TD	Y	Y
3. Safety at Sea for Small Fishing Boats (<i>Appendix 3</i>)	TD	Y	Y

PROGRAM DOCUMENT

Program Category:	Other Program
Program Title:	Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program
Lead Department:	Training Department
Lead Country:	TBD
Total Duration:	2008-2012
Proposed Budget:	13,000 USD

1. INTRODUCTION

Cetacean is one of the most distinctive and highly specialized orders of mammals meant whale, dolphins, and porpoises. They include the largest animal that has ever lived, the blue whale; the highly intelligent and communicative dolphins; the tusked narwhals and blind river dolphins and singing humpback whale, nearly eighty living species in all. Most species are marine but some dolphin species are found in both marine and freshwater such as Irrawaddy dolphin (*Oranella brevirostris*) which is distributed in near shore tropical and subtropical marine waters, often associated with estuaries and mangrove forest. They also occur far upstream in the Ayeyarwady (formally Irrawaddy) river system of Myanmar, Makhakam river of Indonesia, and Mekong river system of Loa, Cambodia, and Vietnam.

At present, information on composition of abundant of cetacean species in the Southeast Asian waters are still not sufficient. Most of cetacean research has been conducted based on the field observation, and dead specimens recording at shore. Not many research works has been conducted by sighting survey. With regards to the survey plan of SEAFDEC research vessels in the Southeast Asia waters, cetacean species such as dolphin and whale were often found by sighting. Every year, more than 5000 nm the research vessel, namely M.V. SEAFDEC 2 has sailed to many sea areas in the region. In order to collect scientific information on the distribution and composition of cetacean species in Southeast Asian waters, the cetacean research by SEAFDEC was initiated since 2008.

2. PROGRAM

2.1 Objectives

The objectives of this project are to:

- 1) Develop regional inventory of all cetacean namely whale and dolphin found in the Southeast Asian Waters through the cetacean sighting program using SEAFDEC research vessels;
- 2) Gather information on the accidentally death of cetacean on the coastal area of the region;
- 3) Gather information on the cetacean sighting program existed in the Southeast Asian countries;
- 4) Enhance human resources capacity on the cetacean research works in the region; and
- 5) Disseminate information on species distribution in relation to the coastal and marine habitat/ecosystem in the Southeast Asian waters.

2.2 Program Description

The program of activity under this project focuses on human resources capacity building for better understanding of the abundance of cetacean inside and beyond EEZ of the Southeast Asian waters. The project also supports the actual survey during the cruise of M.V. SEAFDEC 2 to/from EEZ countries of member country that requested for the national resources survey. The activities also include compilation of information on the cetacean found in the coastal and marine waters in the

Southeast Asian waters. Moreover, the project will initiate the process for further establishment of a sharing mechanism at regional level for updating information and coordination among relevant initiatives related to cetacean research.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

3.1 Activities Achievements in the Year 2010

Activity Title	Duration	Remarks
1. Workshop/Consultation visit and preparation work	Nov	Organized the Regional Training Program on Cetacean Information Gathering and Research Methodology on Cetacean Stock Assessment, 23-25 November, Thailand
2. Information gathering/collection and actual survey	May – Dec	Information gathered by actual surveys using MV SEAFDEC2 during the cruising to/from Brunei, and Sabah & Sarawak of Malaysia.
3. Data analysis and information dissemination	Jan – Dec	Analysis of data collected since 2009

3.2 Evaluation of the Program Outcomes till the Year 2010

3.2.1 Theme and issues:

(1) Theme: Information collection on cetacean in the Southeast Asian waters
(2) Issues in the region at the beginning of the study: <ul style="list-style-type: none"> • No existing regionally information collected on the cetacean species and its abundance in Southeast Asian waters • Insufficient information on interaction of large cetacean to coastal habitat in Southeast Asian waters • Weak coordination among relevant agencies at both regional and levels on cetacean research program/activity

3.2.2 Expected final goals of the program:

<ul style="list-style-type: none"> • Inventory of the cetacean species and information on whale and dolphin watching hotspots in the Southeast Asian waters • Inventory of stranding of cetaceans in the Southeast Asian waters • Better understanding on the interaction between large cetacean and coastal habitat • Medium and long-term regional program/activity on the cetacean research
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3.2.3 “Steps” toward achieving final goals:

Step 1: Review of information and data collection <ul style="list-style-type: none"> • Information/data collection based on existing program/initiative in the region, and through technical consultation
Step 2: Establishment of the inventory of the cetacean species and their abundance in the Southeast Asian waters <ul style="list-style-type: none"> • Organization of the regional technical consultation/workshop for information collection and establishment of a core expert group on cetacean • Establishment of the inventory of the cetacean species and their abundance in the Southeast Asian waters
Step 3: Information exchange among national/regional experts on cetacean for its conservation, and information dissemination. <ul style="list-style-type: none"> • Establishment of a sharing mechanism at regional level for updating information and coordination among relevant initiatives related to cetacean research • Publication on the major findings the interaction between large cetacean and coastal habitat • Publication of the list of cetacean abundance in the Southeast Asian waters

3.2.4 Activities in the current program:

(1) Current position of the program: Step 1, 2, and 3
(2) Project duration: 2008-2012
(3) Main activities: <ul style="list-style-type: none"> • Capacity building on cetacean research work for the Member Countries through a series of training program • Information gathering and actual survey by research vessels, review document, and through the workshop/consultation; and • Data analysis and information dissemination

3.2.5 Progress and achievements of the current program:

(1) Main activities conducted in the current program	
<ul style="list-style-type: none"> • Workshop and consultation visit for preparation works on cetacean sighting program <ul style="list-style-type: none"> - Organization of the 1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Region, TD, 30-31 July 2009 - Organization of the Regional Training Program on Cetacean Information Gathering and Research Methodology on Cetacean Stock Assessment, 23-25 November 2010, Thailand. • Information gathering and actual survey by research vessels <ul style="list-style-type: none"> - Continually support TD's staff to carry out actual cetacean sighting program on the research vessels - Continually support the review of available information regarding cetacean research works • Data analysis and information dissemination • Analyzing of data collected from the 1st Regional Workshop on Information Gathering and Cetacean Research in the Southeast Asian Region 	
(2) Main achievements till the end of 2010	
<ul style="list-style-type: none"> • Information on whale and dolphin found in the Southeast Asian waters • Information on whale and dolphin hotspot in the Southeast Asia • Information on the declining of Irrawaddy dolphin population in Mekong river • Set of recommendations for future national program/activity related to cetacean research • Establishment of cetacean specialist network in the Southeast Asia 	
(3) Outcomes during the program period and expected achievement rate till the end of 2010	
Expected outcome	Achievement rate (%)
Workshop and consultation visit for preparation works on cetacean sighting program	100%
Information gathering and actual survey by research vessels	100%
Data analysis and information dissemination	70%

3.2.6 Evaluation of Program activities in 2010

During the project implementation since the year 2008, coordination and collaboration with relevant organizations (*i.e.* national endangered species conservation agencies and local institutions concerned) have been strengthen. In addition, harmonization and streamlining the recording sheet for cetacean sighting program has been initiated by the project in close collaboration with such national authorities. Information on distribution of the cetacean, including hot spot and others, have been regionally recorded by using capacity of programmer of the Training Department in order to come up with useful information sharing among agencies concerned on the cetacean conservation and fisheries resources utilization.

4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

The project activities will be implemented as follow:

Activity 1: Workshop/Consultation Visit and Preparatory Works on Cetacean Sighting Program

Information gathering for a better understanding of the cetacean species in marine and freshwater in Southeast Asian waters is one of the aims of the project, the organization of the 2nd Regional Workshop on information collection on cetacean species in the Southeast Asian Waters is planned.

The regional experts and participants of the 1st regional workshop held at TD in 2009 will be generally invited. In addition, follow-up works based on the recommendations from the 1st Workshop and major findings from the project implementation to date will be discussed and reviewed during the 2nd Workshop. Under this category, coordination works among relevant initiatives will also be strengthening.

Activities 2: Support Information Gathering/Collection and Actual Survey

Based upon the utilization of the SEAFDEC's research vessels as requesting by the Member Countries, including MV SEAFDEC and MV SEAFDEC2, it is envisaged that 2~3 survey cruises per year will be carried out. In this connection, information collection of the stranding cetacean and its abundance during the cruise surveys in collaboration with Member Countries and other relevant initiatives will be conducted. In addition, the activity under this program will also include the support of SEAFDEC's staff to join cruise survey by using national research vessels to: (i) carry out the cetacean sighting program, and (ii) exchange knowledge among experts on the cetacean sighting program.

Activity 3: Data Analysis and Information Dissemination

The list of cetacean species and their abundance in the Southeast Asian Waters found during the sighting programs will be analyzed and disseminated. The draft preliminary outcome of the project implementation since 2008 will be summarized and updated.

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
1.Workshop/Consultation visit and preparation work	Aug	Organization of the Advanced Regional Training Program on Cetacean Information Gathering and Research Methodology on Cetacean
2.Information gathering/collection and actual survey	Mar – Dec	Information gathered by actual surveys using M.V. SEAFDEC and other research vessels
3.Data analysis and information dissemination	Jan – Dec	Development and design for regional inventory of cetacean in the Southeast Asian waters

4.2 Expected Outcomes in the Year 2011

It is envisaged that the main activity for the year 2011 includes development and design of regional inventory of cetacean found/distribution in the Southeast Asian waters, through the process of information gathering including data both collected by the national observing program and SEAFDEC actual sighting program. Regional synthesis on the cetacean species found in the region will also be drafted for further discussion during the course of advance regional training program on cetacean information gathering and research methodology on cetacean.

PROGRAM DOCUMENT

Program Category:	Other Programs
Program Title:	Sustainable Fisheries for Food Security in the ASEAN Region
Project Title:	Promotion of Inland Small-scale Fisheries Management Through Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Approaches
Lead Department:	Training Department
Lead Country:	Lao PDR and Myanmar
Total Duration:	2008-2011
Proposed Budget:	USD 20,000

1. INTRODUCTION

Since the adoption of the FAO Code of Conduct for Responsible Fisheries in 1995, SEAFDEC has implemented various activities to promote responsible fisheries in Southeast Asia. Starting with the regionalization of the global code into regional contexts and production of Regional Guidelines for Responsible Fisheries in Southeast Asia from 1998 to 2006 (covering responsible fishing operations, responsible aquaculture, responsible fisheries management, and responsible fisheries post-harvest practices and trade); this was followed by translation of the guidelines to national languages and provisions of HRD activities to support the implementation of responsible fisheries in the region. In addition, the principle of responsible fisheries has also been embedded in SEAFDEC programs of activities from formulation until their implementation.

In June 2007, SEAFDEC was informed of the endorsement by the FAO Council nominating SEAFDEC as the recipient of the Margarita Lizarraga Medal Award for the biennium 2006-2007. This award is given to SEAFDEC for its efforts in promoting the adoption of the Code of Conduct for Responsible Fisheries (CCRF) in the ASEAN Region.

SEAFDEC still further promote the concept of CCRF by implementing on various regional programs. Most of the CCRF implemented programs have focused in the coastal and marine fisheries. Very few programs were implemented in the inland areas remarkably in Lao PDR and Myanmar. Therefore SEAFDEC, using Japanese unspent from MoFA proposes to promote on inland small-scale fisheries management through rights-based fisheries and co-management towards institutional building and participatory approaches concept to those two countries as pilot projects. It is expected that the outcomes from those two pilot countries could be fulfill the gap in implementation of the CCRF, in addition, the outcomes could also apply and benefit to all SEAFDEC Member Countries.

2. PROGRAM

4 Years 2008-2011

2.1 Objectives

- 1) To promote the practice of rights-based fisheries and co-management to improve inland small-scale fisheries management in ASEAN Member Countries,
- 2) To strengthen a fishing community organization and its institution to take leading role in practicing rights-based fisheries and co-management for achieving inland small-scale fisheries management,
- 3) To establish sustainable inland small-scale fisheries resource management entity at local levels,
- 4) To alleviate poverty in inland small-scale fishing communities.

2.2 Program Description

The main objectives of the program are to test and demonstrate the community-based co-management for sustainable inland small-scale fishery resources to applicability integrated with approach in alleviation of poverty in inland communities. The project deploys pragmatic activities to stimulate and encourage people's participation as well as to build people's capacity for involvement in inland small-scale fisheries 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 inland small-scale fisheries resource management.

The activity will also focus on the stakeholders for strengthening the fishing community institutional organizations or groups so as for them to understand and enable them to implement the application of inland small-scale fisheries management by using rights-based and co-management in fisheries management. In addition, complementary efforts will be exerted at improvement of their livelihood. The project aimed to mobilization of expertise from SEAFDEC Departments and Member Countries into the project site implementation activities.

3. PROGRESS OF ACTIVITIES IN THE YEAR 2010

Activity Title	Duration	Remarks
<p>Activity 2: Case study on the promotion of rights-based fisheries and co-management for strengthening an integrated inland small-scale fisheries management implementation</p> <p>Activity 2-2: Workshop/Seminar on rights-based fisheries and co-management for inland small-scale fisheries management with local fisheries officers and stakeholders</p> <ul style="list-style-type: none"> • The workshop title will be “Stakeholder of Nam Ngum Reservoir Consultative Workshop” • Venue: DLF, Vientiane Provincial Office • Participant : Local fishermen in Nam Ngum reservoir, fisheries officer of DLF, Lao PDR, SEAFDEC/TD staffs and resources person . • Duration: 14 -15 December 2010 • Objectives : <ul style="list-style-type: none"> - To enhance capacity building of local stakeholder on concept of co-management and rights-based fisheries for improve inland small-scale fisheries development and management - To practice and form co-management institution of stakeholder and local government agencies for improve inland small-scale fisheries development and management <p>This activity delivers to community meeting to let the community people itself recognize its own community and practice related to rights-based fisheries and co-management. The activity also restores the results of fish conservation area to community and sharing information between local stakeholders and governmental agencies concerned. The workshop will enhance users' consensus on the self-regulatory use of fisheries resources and on the reduction of conflict between resource users.</p>	<p>14 -15 Dec. 2010</p>	<p>Under preparation</p>
<p>Activity 2-4: Technical transfer and assistance for developing capacity building for local fisheries officer and stakeholder</p>		
<p>Activity 2-4-1 Training course on freshwater fish cage culture for local fisher folk in Nam Ngum Reservoir, Lao PDR</p>	<p>24 -29 May 2010</p>	

<ul style="list-style-type: none"> • Venue: Training program was conducted at Udonrthani Fisheries Research and Development Center, Thailand. • Participant : 18 Fisherman from 4 villages namely Ban Sangsawang, Ban Hauyprung, Ban Mai and Ban Donchai Udom, provincial and district fisheries officers from Department of Livestock and Fisheries (DLF), Lao PDR , • Duration ; 24 -29 May 2010 • Objectives : <ul style="list-style-type: none"> ▪ To provide technical assistance and transfer of freshwater fish cage culture technology to local fisher folk in Nam Ngum reservoir, ▪ To improve fisheries livelihood for fisherman group in project site by means of introduction of freshwater fish cage culture as alternative source of generating income. <p>Activity 2-4-2 Study trip on freshwater reservoir management in Thailand for local stakeholder of Duya Inn, Myanmar</p> <ul style="list-style-type: none"> • Venue : Training Department, Kang Kra Chan, and Borrapech reservoir • Participant : 4 lease fisheries in Duya Inn reservoir and local fisheries officer of Hinthada, Myanmar. • Duration ; 7-10 September 2010 • Objectives : <ul style="list-style-type: none"> ▪ To provide technical assistance and transfer of freshwater reservoir management technology to local stakeholder of Duya Inn, ▪ To strengthen of freshwater reservoir fisheries management to lease fisheries in Duya Inn reservoir and local fisheries officer in project site at Myanmar. 	7-10 Sep. 2010	Activity was suspended
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4. PROPOSED FUTURE ACTIVITIES FOR THE YEAR 2011

4.1 Planning of the Project Activities

Project/Activity Title	Duration	Remarks
<p>Activity 2: Case study on the promotion of rights-based fisheries and co-management for strengthening an integrated inland small-scale fisheries management implementation</p> <p>Activity 2-2: Workshop/Seminar on rights-based fisheries and co-management for inland small-scale fisheries management with local fisheries officers and stakeholders</p> <ul style="list-style-type: none"> • The workshop title will be “Stakeholder of Duya Inn Reservoir Consultative Workshop” • Venue: Duya Inn, Hinthada, Myanmar • Participant: Local fishermen in Duya Inn reservoir, fisheries officer of DOF Myanmar, TD staffs and resources person . • Duration: 19 -20 April 2011 • Objectives : <ul style="list-style-type: none"> ▪ To enhance capacity building of local stakeholder on concept of co-management and rights-based fisheries for improve inland small-scale fisheries 	19 -20 April 2011	

<p>development and management,</p> <ul style="list-style-type: none"> ▪ To practice and form co-management institution of stakeholder and local government agencies for improve inland small-scale fisheries development and management, <p>This activity delivers to community meeting to let the community people itself recognize its own community and practice related to rights-based fisheries and co-management. The activity also restores the results of fish conservation area to community and sharing information between local stakeholders and governmental agencies concerned. The workshop will enhance users' consensus on the self-regulatory use of fisheries resources and on the reduction of conflict between resource users.</p> <p>Activity 3: End of Project Regional Workshop/Seminar</p>	<p>October 2011</p>	
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4.2 Expected Outcomes in the Year 2011

<ul style="list-style-type: none"> • Promote the practical implementation of rights-based fisheries and co-management to improve inland small-scale fisheries management in ASEAN Member Countries,
<ul style="list-style-type: none"> • Improvement of fisher livelihood,
<ul style="list-style-type: none"> • Achieve the community-based co-management for sustainable utilization of inland fisheries resources,
<ul style="list-style-type: none"> • Foster/Strengthen a fishing community organization(s).

PROGRAM DOCUMENT

Program Category: Other Programs
Project Title: Safety at Sea for Small Fishing Boats
Prospect Funding Agency: xxx
Lead Department: Training Department
Duration: 2011

1. INTRODUCTION

There are over a million small fishing boats operating in the Southeast Asian region. Such big number could easily pose high risks in fishing operations. Although some fishers and crew could be very skillful as accomplished sailors, and possessing great amount of knowledge on weather and sea conditions, accidents involving fishing boats still continue to happen. This is coupled with natural disasters that occurred unexpectedly due to the effects of climate change and global warming.

Two workshops on safety at sea were organized by SEAFDEC/TD in collaboration with the SEAFDEC Member Countries in 2003 and 2010. The recommendations from those workshops included the establishment of a collaborative mechanism among relevant agencies, organizations and authorities for the improvement and promotion of safety at sea for small fishing boats and human security such as the living conditions of fishers on fishing boats through the preparation of regional guidelines for safety at sea of small fishing boats for Southeast Asia. Moreover, considering the recommendations as over-all framework, the Workshop also suggested that appropriate regional programs on Safety at Sea could be developed by the respective Southeast Asian countries. In addition to this, the implementation of safety at sea for small fishing boats should be continued implementation to reduce accidents from fishing operations.

2. OBJECTIVES

- 1) To promote safety at sea for small fishing boats to reduce accidents from fishing operations
- 2) To build human capacity for safety at sea of small / medium scale fishing boats

3. EXPECTED OUTPUTS

- 1) The representative from Member Countries will be more suitable trained to build up human capacity and awareness on safety at sea management and aspects.
- 2) The representative from Member Countries will be as a trainer and extension on safety at sea to fisherman in their country.

4. PROGRESS AND STATUS

In the year 2010, the Second Regional Technical Workshop on Safety at Sea for Small Fishing Boats was held at the Training Department (TD) from 20 to 23 April 2010. The Second Technical Workshop aimed to establish a collaborative mechanism among relevant agencies, organizations and authorities for the improvement of safety at sea for small fishing boats and the living conditions of fishers on fishing boats as well as to initiate the preparation of regional guidelines for safety at sea of small fishing boats for Southeast Asia.

This Regional Technical Workshop was attended by representatives from the SEAFDEC Member Countries, namely: Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam as well as from Timor-Leste. The Workshop was

also attended by representatives from the Bay of Bengal Program-Intergovernmental Organization (BOBP-IGO), Fisheries Research Agency (FRA) of Japan, Food and Agriculture Organization (FAO) of the United Nations, Kasetsart University (KU) of Thailand, Marine Department of Thailand, National Disaster Warning Center of Thailand, National Fisheries University (NFU) of Japan, the Secretariat of the Pacific Community (SPC), the Thailand Maritime Enforcement Coordination Center (Thai-MECC or SORNCHON), and from the Tokyo University of Marine Science and Technology (TUMSAT) of Japan. The SEAFDEC Secretary-General, Deputy Secretary-General and senior officials from the SEAFDEC Secretariat, Marine Fishery Resources Development and Management Department (MFRDMD), and TD also attended the Workshop.

The Workshop was also envisaged to establish a network for the exchange and sharing of information on the improvement of the conditions of fishing boats and lives of fishers at sea in the Southeast Asian region. The Workshop reviewed and enhanced the recommendations from the December 2003 Workshop, and came up with the over-all recommendations on Safety at Sea for Small Fishing Boats in the Southeast Asian Region. Considering the recommendations as over-all framework, the Workshop also suggested that appropriate regional programs on Safety at Sea could be developed by the respective Southeast Asian countries. In this connection, the Workshop also suggested that issues and concerns on Safety at Sea raised during the Workshop could be included as inputs for discussion during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020: "Fish for the People 2020" scheduled in June 2011 in Bangkok, Thailand.

The recommendations on safety at sea for small fishing boats in Southeast Asia was adopted During the Second Regional Technical Workshop on Safety at Sea for Small Fishing Boats the Second RTC on Safety at Sea for Small Fishing Boats

1. Development the appropriate incident reporting and investigation systems for the purpose of improving safety at sea, taking into account the following considerations:
 - The guidelines on accident reporting and analysis currently being developed by FAO;
 - The possible establishing of incentives for fishermen, indemnity programs, registration systems for fishing vessels, MCS systems and subsidies to the fishing industry; and
 - The objective of the systems should be appropriate for the size of vessels and types of fishing operations or facilities onboard.
2. Promote the registration of small fishing boats.
3. Promote and ensure that safety aspects, including considerations on working conditions and socio-economic development, are incorporated and addressed by concerned authorities while improving the monitoring and control of the status and use of small scale fishing vessels
4. Strengthen local authorities and local organizations and promote application of safety at sea standards among the coastal communities.
5. Promote technical and financial support from authorities, including subsidies, at all levels for issues of safety at sea, including considerations on working conditions and socio-economic development.
6. Identify and promote the basic requirements for safety at sea in the following areas:
 - research on the design and construction of small fishing boats including the modification of traditional type boats;
 - safety equipment including fire fighting and life-saving appliances;
 - regular maintenance and repair of boats, gear and equipment; and
 - development of regular boat inspection systems.
7. Implement training and education programs for all stakeholders including the fishers, family members, boat builders and others, for basic requirements of:
 - boat design and construction;
 - equipment and its correct use (including avoidance of dangerous fishing practices);



- search & rescue operations;
 - occupational health, working conditions and safety awareness; and
 - awareness of environmental factors.
8. Promote awareness among policy makers, central authorities and broader public on the safety hazards facing people involved in fisheries in order to:
- Attract more attention and resources to be allocated to safety at sea aspects;
 - Provide knowledge on the working conditions and hardship facing by fishers (which are increasing following the impact of climate change); and
 - Raise political will to address safety at sea and in strengthening the local organizations.
9. Develop and promote the use of appropriate communication systems for:
- weather forecasting information; and
 - search & rescue systems.
10. For definition of ‘small fishing boats’ and ‘operational range’, reference should be made on the respective rules and laws of individual countries.

REVIEW OF SEAFDEC PIPELINE PROJECTS

4. 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.

5. 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)

- Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management (2011-2012) (*Appendix 1*)

ASEAN

- Climate Change and its Impacts on Fisheries and Aquaculture: Adaptation and Mitigation towards Food Security (2010-2012) (*Appendix 2*)
- Promoting Sustainable Food Production through Responsible Fishing Technologies and Practices (*Appendix 3*)
- Strengthen Food Security Arrangements through Fisheries Intervention: Strengthening National and Local Governments in the Development of Food Security Programs/Initiatives (2010-2012) (*Appendix 4*)

UNEP/GEF/SCS

- Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand (2010-2014) < under the communication with relevant countries to submit the Letter of endorsement for implementation and secure the Budget under the Biodiversity in each country, the Philippines submitted the Letter of Endorsement in October 2010 > (*Appendix 5*)

EU

- Improved Fisheries Management through an Ecosystems Approach to Fisheries by Development and Management of *Refugia* and Marine Protected Areas in the Eastern Gulf of Thailand < was denied in mid of 2010 > (*Appendix 6*)

FAO/GEF (REBYC-II CTI)

- Strategies for Trawl Fisheries By-catch Management < New proposal from 2011 > (*Appendix 7*)

6. 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.



ASEAN Cooperation Project Document

Project Purpose Code:

Project Title: Enhancing Coastal Community Resilience for Sustainable Livelihood and Coastal Resources Management

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

Sponsoring ASEAN Body

Sectoral Committee/Main Body: ASEAN Sectoral Working Group on Fisheries (ASWGF)

Meeting Number/Date:

Working Group/Sub-Committee:

Meeting Number/Date:

Proponent’s name and address: Southeast Asian Fisheries Development Center (SEAFDEC)

Date of preparation: 16 January 2009

Proposed funding source: Islamic Development Bank (IDB)

Project budget

Description	Total Allocation (\$)
1. Contracts with Individuals	_____
2. Contracts with Organizations	_____
3. Equipment	_____
4. Supplies and Services	_____
5. Travel and Per diem	_____
Total:	250,000

Information below to be completed by the PCU

Recommendation of Secretary-General/Project Appraisal Committee

PAC Meeting Number/Date:

Endorsements:

Approval of ASEAN Standing Committee

Meeting Number/Date:

Endorsements:



ASEAN Cooperation Project Document Format

1. PROBLEM TO BE ADDRESSED

The first paragraph of the Project Document will define the problem (s) that the project will address. This section should be limited to a brief statement of the problem, as determined in the problem analysis. In general, one project should focus on one large problem. The statement of a single problem will lead to the statement of a single objective.

The coastal areas in the Southeast Asia provide the means of livelihood to the coastal dwellers, where hundred thousands of coastal families are directly engaged in fishing activities and coastal aquaculture including related activities such as fish processing, marketing, boat building, net making, etc. The fishers' over-dependence on the coastal fisheries resources has however, led to over-exploitation and degradation of the resources. The conflict on the multiple resource use also threatens the livelihood of coastal fishing communities. Moreover, the recent devastations caused by natural disasters hamper the vulnerability of these communities. Impacts of climate change also add complexity to the problems that they are encountering. Many fisher communities seem to be isolated and/or insufficient benefit from government services net systems that may exist in other areas of the country. In addition, the communities have to pay more for fuel, food and services, while the income from their products is an inverse. These problems brought about unsustainable use of fishery resources, by reason of the fisher communities have to continuously intensify their fishing efforts to maintain their livelihoods.

2. BACKGROUND, PROBLEM ANALYSIS AND JUSTIFICATION

a. Background

The Background section of the Project Document should provide factual information about the context of the problem that is to be addressed. This section should also include description of the present situation, any related current and past ASEAN activities, and the relevant ASEAN policies and plans of action.

The Southeast Asian region is home to the largest Muslim populations in the world (estimated to be about 240,000,000 in 2007), which is almost one-half (about 42%) of the region's total population (in 2007: 571,337,070) with Indonesia having the world's biggest Muslim population (88% of its total population of 225,000,000). Most of the Muslim communities are in coastal areas with fishing as an ethnic occupation. Since the region's coastal fisheries resources, once viewed as inexhaustible source of fish protein for human consumption have deteriorated, concerns have therefore increased for the protection and conservation of the coastal resources for sustainable livelihoods and food security of the coastal dwellers.

The ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People" (hereafter refers to "the Millennium Conference) held in Bangkok from 19 to 24 November 2001, recognized the importance of sustainable fisheries for food security and the livelihoods and well-being of the ASEAN people. The Conference was successfully concluded by the adoption of "*the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region*" by the fisheries related ministers and senior officials of ASEAN-SEAFDEC Member Countries as the regional common fisheries policy and priority actions.

Within the regional context, fisheries sector is being addressed among other priorities to accelerate the regional economic integration as spelt out in the **ASEAN Vientiane Plan of Action** as well as regional collaboration in promoting sustainable fisheries development through the ASEAN-SEAFDEC Fisheries Consultative Group Mechanism under the recently adopted **ASEAN-SEAFDEC Strategic Partnership Program (FCG/ASSP)**.

Most of the coastal fisheries communities in the ASEAN Region are characterized as small-scale fisheries. The production from small-scale fisheries contributes to national economic growth. Nevertheless, the endowment, potential, and resilience of the small-scale sub-sector have not been recognized and highlighted, while it is immensely contributed to resource utilization. This critical issue should also be addressed along line with the **ASEAN Socio-Cultural Community (2008-2015)** that the region's aspiration to lift the quality of life of its peoples through cooperative activities that are people-oriented and environmentally friendly geared towards the promotion of sustainable development.

In addition, the coastal dwellers are also prone to the drastic change of coastal environment. In December 2004, coastal communities in Indonesia, Thailand, Malaysia, and Myanmar had to suffer from the great loss of lives and assets due to the unprecedented scale of earth quake and Tsunami. Such large-scale natural disaster further aggravated their poverty status of the people in the areas. In respond to the tragic incident, ASEAN community adopted "**ASEAN Declaration on Action to Strengthen Emergency Relief, Rehabilitation, Reconstruction and Prevention on the Aftermath of Earthquake and Tsunami Disaster of 26 December 2004**" as their policy commitment to support Tsunami affected people. The coastal villages throughout the region are also facing hardships due to the impact from climate change such as sea level rise, increase of sea temperature, change of fish habitat and its ecosystem, natural hazards, etc. The ASEAN-SEAFDEC Member Countries have put a serious concern on this issue and recently identified the **required adaptive measures and activities to mitigate the impacts of climate change** to be undertaken by SEAFDEC and the national agencies responsible for fisheries in the Member Countries. In addition, Indonesia as the lead country also prepared a proposal on the **ASEAN Strategy Addressing the Impact of Climate Change on Agriculture, Forestry and Fisheries**, for further submission to the SOM-AMAF.

Since the enhancing of coastal fisheries communities' resilience is involved with various cross cutting issues and required strong commitment and coordination from national government, organizations, local institutions, this project is therefore proposed in order to improve livelihoods of the Muslim coastal dwellers, who is the majority of coastal population, through community fisheries organization and governance in order that the coastal resources utilized by the fishers could continue to sustain its function as the source of food and provide means of livelihood for the region's fishing communities. The target beneficiaries of this project are the Muslim communities in the region's coastal areas.

b. Problem analysis and justification

The Problem Analysis and Justification section is the most important section of the Project Document. The section should present a logical analysis that justifies regional action by ASEAN. The section should discuss the following topics and questions:

Problem analysis What are the underlying causes of the problem to be addressed? Details from the problem analysis should be presented here.

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

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

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

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

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

Regionality: Is the problem regional in nature? Can the problem and its causes be effectively and appropriately addressed at the regional level? Answers to these questions derived from the regionality analysis exercise should be presented here.

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

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

Participation Which ASEAN Member Countries want to participate in this project?

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

Beneficiaries Who will be the likely beneficiaries of a solution to the problem or need?

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

Commitment and sustainability What complementary national actions are interested member Governments currently implementing to address the problem or would be needed along with regional action to fully address the problem? Are the concerned ASEAN member Governments committed to bearing the costs of required complementary national actions and the long-term costs of regional action?

Project implementation requires strong commitment to achieve the objectives and activities of under the project both at national and local levels. National fisheries related agencies are requested to provide in-kind contribution and keep close collaboration with SEAFDEC to facilitate the project implementation, especially coordination with stakeholders, and also ensuring that the implementation of the project would along line with national instruments. Financial contribution from national government will be only required in extraordinary cases which could not be covered by the project. The identified future follow-up activities based on the outcomes of the project should be follow-up by respective national governments to maintain sustainability of the project promotion.

3. POSSIBLE SOLUTIONS

The purpose of the Possible Solutions section of the Project Document is to ensure that alternative strategies or approaches to solving the project problem have been identified and assessed. What possible approaches to the problem were identified in the problem analysis? Are there other possibilities? What are the advantages and disadvantages of pursuing each option? What would be the consequences of doing nothing? What strategy has been selected as the best approach to solve the problem? Why is this option regarded as the best approach?

Coastal communities are highly dependent on fishing for their livelihoods with fewer possibilities to generate alternative source of income. They are thus a strong potential group to risk to the

resource base and habitats. Declining of fish stocks due to over fishing lead to lower production, while increasing competition and conflict between different users. It is widely recognized that not only improving coastal fisheries management that important but also controlling the effects of human activities on the environment are necessity. Linkage between sustainable environment and sustainable livelihoods is a direct variation. Past and present, there are the areas that solve the problems by centralized management and it has proved of ineffective results. There is a growing trend towards a more decentralization of governance in general as well as in fisheries management. Management responsibilities are to share among national government, local organization and institutions, communities and other stakeholders. This type of so called 'co-management system' are becoming popularity and have been successfully implemented in some countries in ASEAN.

To address the issues and problems in coastal communities, policies and institutions in respective ASEAN Member Countries need firm foundation in coastal communities and local levels of governance of natural resources utilization to ensure effective co-management arrangements between the local government and the communities. This has to be coupled with capacity building of communities and local organizations on participatory, inter-disciplinary and community-based strategies in community organization as well as the transfer and adoption of knowledge-based coastal resources management and adoption of sustainable resource use technologies and practices.

People participatory approach will be adopted as the fundamental approach for implementing the project. Specifically, the people participatory approach in community-based fisheries management (CBFM) and co-management (CM) will be used as tools in establishing community fisheries organizations and governance. The community fisheries organizations will take the leading role in community development and management of the coastal resources through the adoption of top-down and bottom-up approaches. In considering the bottom-up approach, community fisheries organizations will be self-formulated to implement their own community development and coastal resource management plans. Following the top-down approach, the community fisheries organizations will also adopt the community development and coastal resource management plans and programs formulated by local governments and higher level authorities.

4. OBJECTIVE AND SUCCESS CRITERIA

a. Objectives

This section of the Project Document, the highest element in the logical framework, should present the best approach as (1) the statement of the results to be achieved by the project or activity (the objective) and (2) the statement of criteria for successful achievement (the success criteria). In other words, the objective should define a desired solution to the identified problem.

The project aims to formulate a practical framework for strengthening and promoting community fisheries and building the capacity of the fishing communities to enable them to organize community economic development activities and sustain their livelihoods in fisheries. Community fisheries organization is a basic and crucial local management body that could lead and function in the promotion livelihood opportunities in fisheries and management of the coastal resource in sustainable and effective ways. Therefore under this project, such community fisheries organizations would be promoted to also take the role as local coordinators for across-sectors' communications among the concerned stakeholders. Such function is fundamental and important to implement the top-down and bottom-up approaches in supporting sustainable livelihood and coastal resource management.

1. establishment of sustainable livelihood opportunities and promotion of coastal resource management particularly in the region's Muslim fishing communities;

2. poverty reduction in fishing communities for food security through promotion of responsible fisheries and coastal aquaculture that is friendly to the environment; and
3. strengthening of the community fisheries organizations in the region's Muslim fishing communities by providing opportunities for community economic development and coastal resource management.

b. Success Indicators

The success criteria will set the *qualitative* standards for successful achievement. These criteria will enable the measurement of the extent of project success. Such measurement will enable the evaluation of the project in terms of the purpose for which it was formulated.

Success criteria can be mainly on the participation of the fishery communities in the activities and its impact on their livelihoods as well as enhance capacity of fishers, and extend to both government and non-government co-operation in ASEAN Member Countries. As the effective implementation of people participatory approach in community-based fisheries management (CBFM) and co-management (CM) at the local level, the firm local governance and institutions can be established to sustain the resource utilization and reduce conflict among resource users. Promote people's participation in organizing community fisheries organizations will be the key to achieve communities' resilience and improvement of livelihoods and coastal resource management. These are especially the participating countries which propose to host the on-site activities. In addition, adoption of technology/initiatives by respective Member Countries, which may lead to strengthening of linkage and working mechanism for local institutions and government, can also be used as a success criterion. The above criteria are parts and puzzles in the long-term achievement improvement of people livelihoods as well as coastal fisheries resources utilization and management in Muslim communities.

c. Success Measures

The success criteria will set the *quantitative* standards for successful achievement. These criteria will enable the measurement of the extent of project success. Such measurement will enable the evaluation of the project in terms of the purpose for which it was formulated.

Enhancing of community resilience and improving livelihoods would be difficult to measure in term of quantity or calculate a monetary value in reality. However, focusing on participatory approach applying in this project could count on the number of people involved in all level of activities under this project.

5. OUTPUTS

Outputs are results or products that are produced and utilized in order to achieve an objective. Several outputs may be necessary to enable the achievement of an objective. The vocabulary chosen to define outputs should describe finished products or completed results, *e.g.*, "a feasibility study" or "trained personnel". This section should list and briefly describe the outputs to be produced for the achievement of each project objective.

The following outcomes are envisaged through the project activities:

1. the region's Muslim fishing communities and other stakeholders undertaking sustainable livelihood activities in fisheries and adopting sustainable coastal resource management
2. the way of life of local people in fishing communities improved and food security specifically in terms of food supply and job opportunities enhanced while the coastal environment is protected and conserved
3. the community fisheries organizations strongly leading the practice of planning and implementing community economic development activities for sustainable livelihood and functioning well specifically in the area of coastal resource management

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

See *Appendix I-1*

6. INDICATIVE WORK PLAN

The indicative work plan should be prepared using scheduling software. This work plan should identify and graphically illustrate the activities in the logical order that is necessary for the production of each output. The vocabulary of activities should describe actions, *e.g.*, "implementation of training" or "consultations with Member Countries' customs departments". ASEAN cooperation often deals with similar outputs. Therefore, the activity lists for common outputs can be based on some standard models.

See *Appendix I-2*

7. MANAGEMENT AND IMPLEMENTATION ARRANGEMENTS

a. Management arrangements

The management arrangements should identify the project's Sponsoring ASEAN Body, *e.g.*, "the Committee on Social Development" or "the working group on non-tariff barriers". That body has the responsibility to designate a manager for the project who will be responsible for the achievement of the project objectives. The project manager must see that the planned work is actually done and that finished work actually achieves the objective. The management arrangements should specify to whom the project manager must report and with which other ASEAN bodies he/she must coordinate the project's work.

The ASEAN Sectoral Working Group on Fisheries (ASWGF_i) will be designated as a manager for the project.

The project management and administration will comprise two levels (project-level and site-level managements) and two stages (preparation and implementation stages). At project-level management, SEAFDEC, local government officials and local stakeholders representing Malaysia, Indonesia and Brunei Darussalam will be nominated as members of the project steering committee. Representatives from the Philippines, Thailand and Cambodia may also be nominated as members of the steering committee.

The steering committee will look at the possibility of implementing project activities in their respective countries. The steering committee may convene an inception meeting during the preparation stage of the project in order to confirm and finalize the project site selection. During the implementation stage, the steering committee may convene regular meetings at least twice a year to monitor the logistics and progress of the project implementation. At site-level management, the selected countries may establish an implementing committee to assist the steering committee in the implementation of the project action plan. During the implementing stage, the implementing committee may convene quarterly meetings (four times a year).

b. Implementation arrangements

The implementation arrangements define the organizational unit or the personnel who will actually produce the project's outputs. The implementers, who may be consultants, experts or personnel of ASEAN Governments or the Secretariat, should be identified for each output. Reporting requirements and relationships should be explained as an element of the implementation arrangements. To ensure full understanding of roles and responsibilities, the project manager should identify "parties responsible" for implementation of each activity when he/she revises the indicative work plan into the actual work plan after project approval.

SEAFDEC is an inter-governmental organization specialized in fisheries through providing technical supports to the ASEAN Member Countries in the field of training, research and information dissemination for over 40 years. It has accumulated its competence in various fields of fisheries including management, assessment of aquatic fisheries resources, capture fisheries, aquaculture and fishery post-harvest development. ASEAN and SEAFDEC have so far continued its strong collaboration in the field of fisheries to secure sustainable fish supply for food security for each ASEAN Member Country. SEAFDEC will therefore be an executing agency for this project.

The SEAFDEC shall be responsible for implementing the Project with due diligence and efficiency, in accordance with the Project Proposal attached and the Budget approved by the ASEAN Secretariat and the Islamic Development Bank (IDB), and with any supplementary arrangement which may be agreed between the Parties. SEAFDEC shall provide technical assistance through organization's human resources within our competent and further collaborate with relevant national and regional experts to accomplish the project activities.

Name of Institution: Southeast Asian Fisheries Development Center
Secretariat
Suraswadi Building
Kasetsart University Campus
P.O. Box 1046 Kasetsart Post Office
Bangkok 10903, Thailand
Tel: +662-940-6326
Fax: +662-940-6336

The project will be coordinated by:

Mr. Somnuk Pornpatimakorn, Administration and Finance Coordinator, and
Mr. Somboon Siriraksophon, Policy and Program Coordinator

The project will be jointly implemented by SEAFDEC and its Departments with the appropriate inputs based on the respective competent developed by these Departments.

c. Monitoring and Evaluation Arrangements

Describe the evaluation strategy for this project, including when the review/evaluation is to take place, the key evaluation issues to be addressed, and how it is to be financed. (It is recommended that the project budget include an allocation for the review/evaluation.)

A performance evaluation report on enhancing coastal community resilience activities will be considered as the project final report reflecting the outcomes of the individual project activities and overall evaluation of the project.

8. INPUTS

There may be many possible combinations of inputs that can produce the proposed outputs. The formulator of the Project Document should seek to identify inputs that will enable efficient project implementation, that are appropriate to the work to be done, and that are cost effective. As an aid to the determination of inputs, the project formulator should refer to the indicative work plan. The questions that project formulators need to consider in regard to the selection of inputs include:

- Which inputs should be used?
- What kind of inputs?
- How many? (for consultants or equipment)
- What duration? (for personnel assignments)
- How much does it cost?

Major inputs required for the production of each output should be presented on a table. This table

can be created using word processing or spreadsheet software. The purpose of the table is to facilitate the selection of appropriate inputs and to enable project implementers and appraisers to easily understand the relationships between inputs and outputs. The table should describe inputs in five categories: contracted personnel, contracted organizations, equipment, supplies and services, and travel and per diem. Additional details, such as TOR for contracts, should be provided and attached as annexes.

Project Activities:

Activity 1: Community surveys and needs assessment

The main objective of this activity is to establish an overview of the traditional community information and scientific database in order to formulate appropriate action plan and activities for sustainable management of the coastal resources and livelihoods in fisheries. Three basic methods will be used, namely: 1) regular conduct of data collection and special topic surveys; 2) using the survey results to set up and prioritize activities that include technology transfer and human resource development; 3) dissemination of survey results to community fisheries organizations through community meetings, extension programs and services. Special topics of the surveys will focus on social, economic, administrative and environmental aspects to assess the capacity, problems and needs of the fishing communities. The participation of community stakeholders in planning and designing the surveys will be promoted. At the project activities planning, the issue on prevention of coastal fisheries community from natural disaster will be also taken into account.

Activity 2: Development of fisheries governance on coastal management

This activity aims to develop the capacity of the local resource users and stakeholders in community fisheries organizations and institutions for coastal resource management applying the well-documented concept of fisheries management. This activity is also intended to strengthen existing institutions of people's groups or organizations in developing community economics and coastal resource management plans. The community fisheries organizations will take the leading role in promoting food security in terms of sufficient fish food supply, various job opportunities and environment-friendly coastal protection activities as well as identification of areas for research and development of simple early warning system for natural disasters. A strategic plan for this activity is the conduct of community fisheries meetings on regular basis to discuss and make decisions as well as exchange information. Training and capacity building activities related to community fisheries organization and institution will be provided to stakeholders concerned. The extension programs and services are aimed to assist the community fisheries organizations and stakeholders in self-managing the coastal resources within their own boundaries and in developing alternative livelihoods.

Activity 3: Contribution of community fisheries to sustainable livelihood

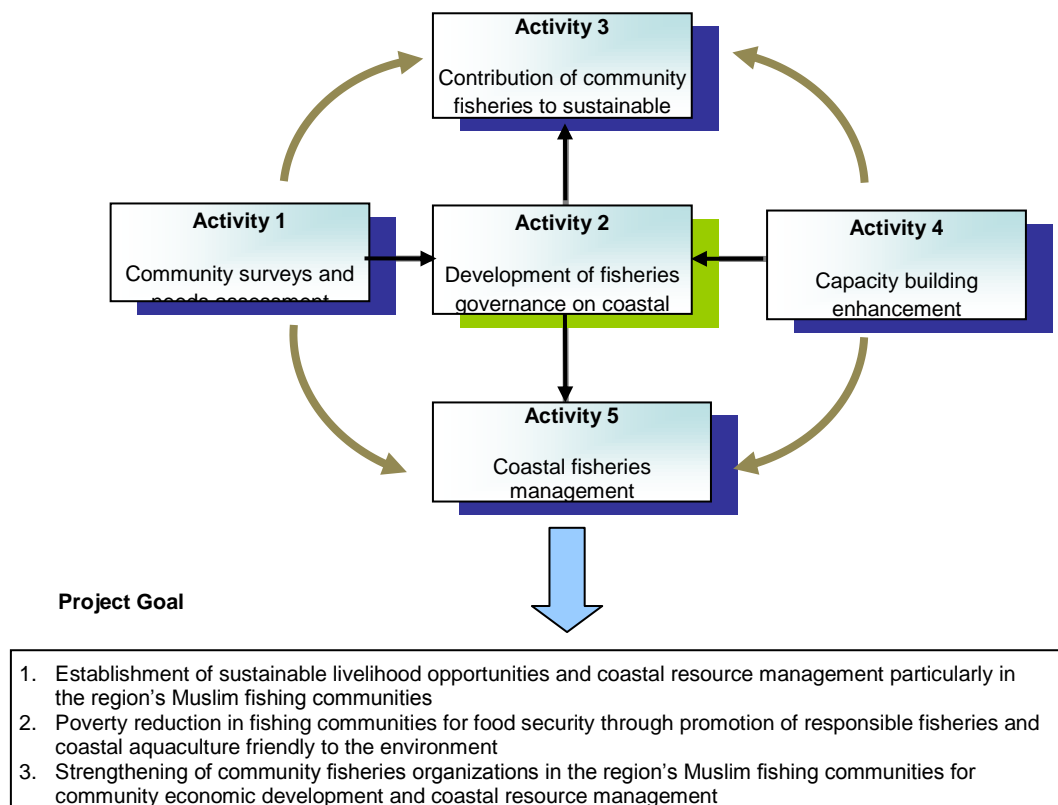
This activity aims to secure means of fisheries livelihood in fishing communities as well as to increase incomes and provide job opportunities particularly outside the fisheries sector. Three strategies will be adopted, namely: fisheries post-harvest technology transfer, responsible fisheries and environment-friendly aquaculture, and recreation fishing. Fisheries post-harvest technology transfer will be conducted through training activities in order to improve the traditional knowledge of women and sanitation in producing community fishery products. This is envisaged to develop and strengthen the capability of women in fishing communities individually and at the organizational level, for the establishment of local community business ventures. Responsible fisheries and environment-friendly aquaculture will be promoted as means of sustainable livelihoods in fisheries. Recreation fishing will also be promoted as possible alternative job opportunities in eco-tourism in the fishing communities.

Activity 4: Capacity building enhancement and extension programs

This activity is intended to enhance the capacity of resource users and stakeholders to be able to actively participate in coastal resource management, sustainable livelihoods development, through a series of training courses and extension programs by strengthening and building upon the traditional awareness and knowledge of the resource users and stakeholders on coastal resource management. Their capacity in developing local business ventures and income-generating activities as well as in financial management will be enhanced. Lessons and experiences gained will be compiled and published as guidelines, manuals and other information formats for dissemination. In addition, the activities will also extend to cope with adaptive to the impacts of climate change and build people's capacity to reduce the vulnerability due to natural disasters. The coastal community should understand and aware of potential impacts of climate change on the coastal environments and able to reduce the risk of their life and livelihoods, this can promote through extension programs and training activities, which the issues cover education on impacts of climate change, training on safety at sea for small-scale fishermen, development of simple early warning system for coastal community, etc.

Activity 5: Coastal fisheries management and enhancement

This activity, which emphasizes on the resilience of coastal resources, aims to enhance and rehabilitate the aquatic resources, habitats and sanctuaries through the traditional fisheries management practices and modern fishing technologies. Resource users and stakeholders will be encouraged to actively participate in fish releasing and installation of fish aggregating devices. Fish releasing will consider the species' economic and conservation aspects, and will be conducted at the right season and in appropriate fishing grounds. Fisheries management practices and fish aggregating devices installation will be implemented based on traditional and scientific knowledge, technology and information. Resource users and stakeholders will be encouraged to take the leading role in the enforcement of rules and regulations based national fisheries laws to strengthen their functions in coastal resource management and enhancement.



As the core activity of the project, Activity 2 intends to promote people's participation in organizing community fisheries organizations based on community-based fisheries management and co-management approaches, and take the main role in fisheries governance on coastal resource management. While Activity 3 mainly supports creating job opportunities and employment for the local stakeholders particularly the women and youth in the fishing communities, Activity 5 aims to enhance and rehabilitate the aquatic resources, habitats and sanctuaries, as primary steps in coastal resource management. The community fisheries organizations established in Activity 2 will take the role of managing Activities 3 and 5 with Activity 1 and Activity 4 supporting Activities 2, 3 and 5.

Results from research and surveys (Activity 1) will be used to determine the capacity and needs for community development and resource management as well as to design the action plan and appropriate project activities. Training and extension programs in Activity 4 for capacity building of the local stakeholders, will be developed based on the results of the surveys. The implementation of the five activities will be prioritized based on local people's needs and the project annual action plan.

8. BUDGET AND FUNDING ARRANGEMENTS

(This section needs further consultation with ASEAN Secretariat and IDB)

The selected inputs and their costs are consolidated on a project budget which should be presented on a spreadsheet under the following headings: contracts (individual, corporate or institutional); equipment; supplies and services; travel and daily subsistence allowance (not related to contracts). If more than one funding source is proposed, a budget should be prepared for each one.

The project is co-funded by Islamic Development Bank (IDB) in cash through ASEAN Secretariat, SEAFDEC in kind including the mobilization of technical staff and use of facilities and services possessed by SEAFDEC Departments and ASEAN Member Countries in kind including mobilization of technical staff as well as existing system to achieve the project objectives. Total budget is estimated in *Appendix 1-3*.

Attachments

The attachments listed and described below should be appended to the Project Document as necessary or appropriate.

a. Mobilization Plan.

A plan should be prepared that describes how the project will be activated once it is approved. The preparation of this plan is especially important when the finalization of funding arrangements remains to be done. This plan could also include the designation of the project manager and any other steps that must be taken to enable the project manager to initiate implementation of the project.

b. Explanation of Budget Estimates.

This attachment should explain how budget estimates were determined for major inputs. In many cases, this attachment may simply refer to ASEAN pro forma figures for budgeting. Otherwise, supporting information should explain how budget figures were calculated.

c. Terms of Reference (TOR) for Contracts.

In the event that important elements of the project will be done on a contractual basis, the TOR should be prepared in draft as attachments. Contracts can be for individuals, firms, non-governmental organizations or other institutions. The format and instructions for the preparation of TOR for contracts provided in Form APDM/TOR.

d. Specifications for equipment.

An attachment should be prepared with the specifications for any equipment item over \$10,000 in value or for multiple purchases of a smaller item whose aggregate value exceeds \$10,000.

e. Other Attachments.

Other attachments may be provided in order to explain or clarify the Project Document. These might include explanatory technical data or a bibliography. Such additional attachments are not mandatory and should be prepared only if deemed essential for understanding of the Project Document by appraisers or potential funding agencies.

Review

The project proponent should review the draft project document for (1) clarity of the logical connections among elements of the project; (2) completeness, according the requirements of the project document format; and (3) correctness (facts, grammar, spelling). The first draft of the Project Document should be circulated for substantive comments within the concerned ASEAN body and revised accordingly before submission to the THE COORDINATION UNIT (PCU) for appraisal and further processing.

Appendix I-1 of Annex 7

LOG FRAME ON PROJECT FOLLOW-UP, MONITORING AND EVALUATION

Expected output	Indicators	Source of verification	Risks
1. the targeted fishing communities and other stakeholders undertaking sustainable livelihood activities in fisheries and adopting sustainable coastal resource management	- 30 % of total households - 5 sustainable livelihood activities both fisheries and non-fisheries sectors	- District or Provincial annual reports - result of base line survey - result of workshop	- natural disaster - limitation of local resources - poor infrastructure
2. the way of life of local people in fishing communities improved and food security specifically in terms of food supply and job opportunities while the coastal environment is protected and conserved	- 30% of total households - 30% of total households income increases higher than national poverty line - 20% of total households have alternative job	- national and provincial economic report - district or provincial annual reports - result of base line survey - result of workshop	- natural disaster - change of poverty line
3. the community fisheries organizations strongly leading the practice of planning and implementing community economic development activities for sustainable livelihood and functioning well specifically in the area of coastal resource management	- 20% of total households enable designed community plan - 30% of total households function in the area of coastal resource management - 4 main types of people group or organization such as women, savings, fisheries and consumer /store cooperative	- District or Provincial annual reports - result of base line survey - result of workshop	- different group interest - limitation of people's participation and society
Activity	Indicators	Source of verification	Risks
Activity 1 community survey and need assessment			
1. Need assessment			
1.1 community development and coastal resource management	list of problems, need and priority	- District or Provincial annual reports	- limitation of stakeholder concerned and participation
1.2 fisheries governance development and management	list of people's organization, institution, group, and list of activities	- District or Provincial annual reports	- out of date of the report
Community survey			
1.3 base line survey	30% of total local residence	- District or Provincial annual reports	- out of date report and data - lack of local residence participation in the survey
1.4 fish marketing survey	list of fish trader and marketing channels diagram	- District or Provincial annual reports	- out of date report and data

1.5 impacts of climate change/natural disaster	List of impacts and destruction reduction	- District or Provincial annual reports	- limitation of official and agency concerned - loss of record
Monitoring & Survey			
1.6 monitoring and evaluation survey on project implementation and termination	50% of local residence participated in project enabling to practice as three main expected output	- national and provincial economic report - district or provincial annual reports - result of base line survey - result of workshop	- out of date report and data
Activity 2 development of fisheries governance on coastal management			
2.1 regular meeting of community fisheries organization and development	85% of local residence attended the meeting receiving knowledge and information.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
2.2 a meeting on discussing and planning on coastal resource management formulation by community fisheries organization	50% of local residence participated in the meeting are able to design community plan coupled with activities.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
2.3 a meeting on plan and activity of local stakeholder participating in community development on voluntary and business basis	Community plan and activities both voluntary and credible performing business activities for implementation.	- district master plan - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
2.4 ad hoc meeting for special issue and activities	List of activities setting up for deal with special issues.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
Activity 3 contribution of community fisheries on sustainable livelihood			
3.1 A workshop on identifying possible approaches to improve community livelihood for women's group and fisher's group	95% of women and fishers participated in the workshop gained skill of SWOT analysis to improve community livelihoods.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- poor women and fishers participation
3.2 Promotion of various fisheries products and micro credit schemes	50% of local residence received and practiced knowledge on creating and improving fisheries products and micro credit system.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation

	10% of community products from fisheries and non-fisheries.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of local resources - poor infrastructure - poor contribution
	50% of local residence particular women would recognize earning income.	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- out of date of report - limitation of society
3.3 Promotion of coastal aquaculture, cage culture and shell culture	20% of local residence carry out aquaculture activities	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of local resources - poor infrastructure - poor contribution
3.4 Promotion of eco-tourism, fishing sport and home stay	5% of local residence carry out eco-tourism activities	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of local resources - poor infrastructure - poor contribution
3.5 Promotion of consumer/store cooperative /group	60% of local residence benefit from the activities	- Report of the cooperative/ group	- poor system and management
Activity 4 capacity building enhancement and extension program			
Training arrangement			
4.1 the orientation of community fisheries organization function and responsibility	50% of local residence participated in the activity	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
4.2 develop community leaders, religious leaders and stakeholders in management and organization of community fisheries	50% of local residence participated in the activity	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
4.3 develop women and youth in fishing communities on community development and coastal management	50% of local residence participated in the activity	- district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- limitation of stakeholder concerned and participation
4.5 capacity building of income and financial management	50% of local residence participated in the activity	- district or provincial annual reports - result of base line survey	- limitation of stakeholder concerned and participation

		<ul style="list-style-type: none"> - result of workshop - other report or record related to 	
Extension program			
4.6 capacity building on responsible fisheries practice and modern fishing technologies	50% of local residence participated in the activity	<ul style="list-style-type: none"> -district or provincial annual reports -result of base line survey -result of workshop -other report or record related to -project report 	-limitation of stakeholder concerned and participation
4.7 capacity building to reduce vulnerability from climate change /natural disaster	50% of local residence participated in the activity	<ul style="list-style-type: none"> -district or provincial annual reports -result of base line survey -result of workshop -other report or record related to -project report 	-limitation of stakeholder concerned and participation
4.8 coastal resource restoration based on the findings of the surveys	50% of local residence participated in the activity	<ul style="list-style-type: none"> - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to - project report 	<ul style="list-style-type: none"> -limitation of stakeholder concerned and participation -limitation of society
4.9 provision of information on community development and coastal resource management through printed materials and local wired announcement (if available)	50% of local residence participated in the activity	<ul style="list-style-type: none"> - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to - project report 	<ul style="list-style-type: none"> -illiteracy -limitation of stakeholder concerned and participation
4.10 coordination with religious leaders and community leaders on logistic works and project implementation	50% of coordinated activity accomplished	<ul style="list-style-type: none"> - community report and record - project report 	<ul style="list-style-type: none"> -limitation of stakeholder concerned and participation -limitation of society
Activity 5 coastal fisheries management and enhancement			
5.1 aquatic resources and habitat enhancement and rehabilitation through traditional fisheries management practice	1 % of total areas of the habitat such as mangrove forests	<ul style="list-style-type: none"> - Dept. of Forestry's report - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to 	<ul style="list-style-type: none"> -natural disaster - limitation of geographic factors - limitation of stakeholder concerned and participation
5.2 promotion of fish releasing and fish aggregating device installation	20% of fishers access and benefit	<ul style="list-style-type: none"> - Dept of Fisheries - district or provincial annual reports - result of base line survey - result of workshop 	<ul style="list-style-type: none"> - natural disaster - limitation of stakeholder concerned and participation

		- other report or record related to	
5.3 enforcement of rules and regulation on new habitat improvement tools by resource users and stakeholders	20% of fishers respected to rules and regulations	- Dept of Fisheries - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- natural disaster - limitation of geographic factors - limitation of stakeholder concerned and participation
	1% of coastal areas has no interruption	- Dept of Fisheries - district or provincial annual reports - result of base line survey - result of workshop - other report or record related to	- natural disaster - limitation of geographic factors - limitation of stakeholder concerned and participation
6. Project evaluation and reporting	30 % of total households -5 sustainable livelihood activities both fisheries and non-fisheries sectors -30% of total households income increases higher than national poverty line -20% of total households have alternative job - 20% of total households enable designed community plan -30% of total households function in the area of coastal resource management -4 main types of people group or organization such as women, savings, fisheries and consumer /store cooperative	- national and provincial economic report - district or provincial annual reports - result of base line survey - result of workshop	- natural disaster - change of poverty line

PROPOSED INDICATIVE WORK PLAN

Project Activity	1 st Year				2 nd Year				3 rd Year			
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
1. Community survey and needs assessment <ul style="list-style-type: none"> • community development and coastal resource management • fisheries governance development and management • baseline survey • fish marketing surveys • impacts of climate change/natural disasters surveys • monitoring and evaluation surveys on project implementation and upon termination 												
2. Development of fisheries governance on coastal management <ul style="list-style-type: none"> • problem-solving and situation analysis with involvement of former and/or newly established community fisheries organizations • formulation of plans and activities on coastal resource management and sustainable livelihood with participation of community fisheries organizations • support for the functions and networking of community fisheries organizations in the area of conflict management • ad hoc meeting for special issues and activities 												
3. Contribution of community fisheries to sustainable livelihood <ul style="list-style-type: none"> • Workshop on identifying possible approaches to improve community livelihoods for women's groups and fisher groups • Promotion of various fisheries products and micro credit schemes • Promotion of coastal aquaculture, cage culture and shell culture • Promotion of eco-tourism, sports fishing and home stay • Promotion of cooperative dry goods grocery store 												

Project Activity	1 st Year				2 nd Year				3 rd Year			
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
4. Capacity building enhancement and extension program <ul style="list-style-type: none"> • Orientation on community fisheries organization functions and responsibilities • develop the community leaders, religious leaders and stakeholders in management and organization of community fisheries • develop women and youth in fishing communities on community development and coastal management • promotion of fish marketing and product development • capacity building for increased income and financial management • capacity building on responsible fisheries practice and modern fishing technologies • capacity building to reduce vulnerability from climate change/natural disasters • coastal resource restoration based on the findings of the surveys • provision of information on community development and coastal resource management through printed materials and local wired announcements (if available) • coordination with religious leaders and community leaders on logistic works and project implementation 												
5. Coastal fisheries management and enhancement <ul style="list-style-type: none"> • aquatic resources and habitat enhancement and rehabilitation through traditional fisheries management and practices • promotion of fish releasing and fish aggregating device installation • enforcement of rules and regulations on new habitat improvement tools by resource users and stakeholders 												
6. Project Evaluation and Reporting												

PRELIMINARY COST ESTIMATE

Categories	Year 1	Year 2	Year 3
1) Activity 1: Community survey and needs assessment	10,000	10,000	10,000
2) Activity 2: Development of fisheries governance on coastal management	12,000	25,000	20,000
3) Activity 3: Contribution of community fisheries to sustainable livelihood	10,000	35,000	20,000
4) Activity 4: Capacity building enhancement and extension program	12,000	20,000	20,000
5) Activity 5: Coastal fisheries management and enhancement	10,000	30,000	15,000
6) Administrative	5,000	5,000	5,000
Sub-total	59,000	125,000	90,000
Contingency (10%)	5,900	12,500	9,000
Total	64,900	137,500	99,000
Total Proposed Budget			301,400

ESTIMATED BUDGET YEAR 1

EXPENDITURE	ACT 1	ACT 2	ACT 3	ACT 4	ACT 5	BUDGET
Travel Cost	1,920	1,920	1,920	1,920	1,920	9,600
SEAFDEC staff (Per diem)	1,440	1,440	1,440	1,440	1,440	7,200
Local staff (per diem)	720	720	720	720	720	3,600
Consultants	200	200	1,000	200	200	1,800
Invited Travel Cost	200	200	200	200	200	1,000
Meeting Cost	320	3,000	-	1,000	1000	5,320
Communications	200	200	200	200	200	1,000
Publications and Stationery	200	600	650	1,000	120	2,570
Supplies and Materials	300	1,800	1650	120	-	3,870
Survey Expenses	3,000	-	-	-	-	3,000
Training Expenses	-	-	2,000	2,500	3000	7,500
Workshop	1,100	520	-	1,500	-	3,120
Transportation	400	1,000	220	1,200	200	3,020
Furniture and Equipment	0	400	0	0	1000	1,400
Sub-total	10,000	12,000	10,000	12,000	10,000	54,000
Administrative	1000	1000	1000	1000	1000	5,000
Contingency (10%)	1000	1200	1000	1200	1000	5400
Contingency (10%) of administrative	100	100	100	100	100	500
Total	12,100	14,300	12,100	14,300	12,100	64,900

ESTIMATED BUDGET YEAR 2

EXPENDITURE	ACT 1	ACT 2	ACT 3	ACT 4	ACT 5	BUDGET
Travel Cost	1,920	1,920	1,920	1,920	1,920	9,600
SEAFDEC staff (Per diem)	1,440	1,440	1,440	1,440	1,440	7,200
Local staff (per diem)	720	720	720	720	720	3,600
Consultants	200	200	200	200	200	1,000
Invited Travel Cost	-	200	200	200	200	800
Meeting Cost	-	2,000	1,000	1,000	-	4,000
Communications	200	200	200	200	200	1,000
Publications and Stationery	100	1,000	1,000	1,000	1,000	4,100
Supplies and Materials	-	1,320	1,000	120	8,000	10,440
Survey Expenses	3,220	-	-	-	-	3,220
Training Expenses	-	10,000	20,000	7,500	6,000	41,000
Workshop	-	3,000	2,000	2,500	6,000	11,000
Transportation	1,200	1,800	2,320	1,200	1,320	7,840
Furniture and Equipment	1,000	1,200	3,000	2,000	3,000	10,200
Sub-total	10,000	25,000	35,000	20,000	30,000	115,000
Administrative	1000	1000	1000	1000	1000	5,000
Contingency (10%)	1,000	2,500	3,500	2,000	2,500	11,500
Contingency (10%) of administrative	100	100	100	100	100	500
Total	12,100	28,600	39,600	23,100	33,600	137,000

ESTIMATED BUDGET YEAR 3

EXPENDITURE	ACT 1	ACT 2	ACT 3	ACT 4	ACT 5	BUDGET
Travel Cost	1,920	1,920	1,920	1,920	1,920	9,600
SEAFDEC staff (Per diem)	1,440	1,440	1,440	1,440	1,440	7,200
Local staff (per diem)	720	720	720	720	720	3,600
Consultants	200	200	200	200	200	1,000
Invited Travel Cost	-	200	200	200	200	800
Meeting Cost	-	2,000	1,000	1,000	-	4,000
Communications	200	200	200	200	200	1,000
Publications and Stationery	100	700	420	1,000	620	2,840
Supplies and Materials	-	1,000	1,000	120	500	2,620
Survey Expenses	3,220	-	-	-	-	3,220
Training Expenses	-	6,120	5,000	7,500	4,000	17,620
Workshop	-	4,000	4,000	2,500	4,500	6,000
Transportation	1,200	1,000	2,000	1,200	350	4,750
Furniture and Equipment	1,000	500	1,900	2,000	350	4,750
Sub-total	10,000	20,000	20,000	20,000	15,000	85,000
Administrative	1,000	1,000	1,000	1,000	1,000	5,000
Contingency (10%)	1,000	2,000	2,000	2,000	1,500	8,500
Contingency (10%) of administrative	100	100	100	100	100	500
Total	12,100	23,100	23,100	23,100	17,600	99,000

Appendix 2 of Annex 7

**CLIMATE CHANGE AND ITS IMPACTS ON FISHERIES AND AQUACULTURE:
ADAPTATION AND MITIGATION TOWARDS FOOD SECURITY**

Concept Note

1. BACKGROUND

Fisheries sector plays a very important role to the national economy particularly on livelihood and food security of people in the ASEAN Region as it has been the main supplier of food protein for the people in all the ASEAN Member States (AMSs). For the past number of years, global concern on climate change called for attention on impact from global warming or climate change including its impact to the fisheries sector. Climate change already affects Southeast Asia, among others through the increase in frequency and intensity of extreme weather with huge consequences *i.e.* flooding and sea water rises, change of water temperature, change in species composition and distribution, coral bleaching, increase in storms and cyclones, etc. Moreover Southeast Asian region is one of the world's most vulnerable regions to climate change, due to its long coastlines, high concentration of population and economic activity in coastal areas and heavy reliance on agriculture, fisheries, forestry and other natural resources.

In the ASEAN Region, climate change is a compounding threat to the sustainability of capture fisheries and aquaculture development as it has impact on ecosystems, livelihoods and implication to food security. Urgent adaptation and mitigation measures are required in response to opportunities and threats to food and livelihood provision due to climate variations. To ensure long-term food security in the ASEAN region in accordance with the ASEAN Integrated Food Security (AIFS) Framework and the Strategic Plan of Action (SPA-FS) adopted by the ASEAN Leaders at the 14th Summit in March 2009 that addressing issue on impacts of climate change on food security; as well as the recently developed "ASEAN Multi-Sectoral Framework on Climate Change: Agriculture, Fisheries and Forestry Towards Food Security" (AFCC Framework), which agreed at the ASEAN High-Level Workshop on the ASEAN Multi-Sectoral Framework on Climate Change and Food Security held in September 2009, a program on "Climate Change and its Impacts on Fisheries and Aquaculture: Adaptation and Mitigation towards Food Security" is initiated to be implemented in the ASEAN Region. The program activities will be implemented under the ASEAN-SEAFDEC Strategic Partnership (ASSP) Arrangement that will provide regional framework on cooperation and coordination on climate change issues relevant to fisheries and food security in the ASEAN Region.

2. OBJECTIVES

Overall objective of the program are to address and respond to the challenges and concerns on climate change to food security from fisheries sector through a range of key climate change adaptation and mitigation measures focusing on developing the knowledge base with respect to fisheries and aquaculture, addressing policy, programs and implementation frameworks at national, regional and international levels, and capacity building and supporting enabling mechanisms.

The specific objectives of the program are as follows:

1. To build capacity for human and institutions involved in fisheries and ecosystem management as well as relevant sectors in tackling and respond to the impacts of climate change and adaptive needs
2. To integrate climate change mitigation and adaptation measures/strategies into the economic and social development policy framework for fisheries (inland and marine fisheries and aquaculture)

3. To strengthen national and regional information and knowledge sharing, communication and networking on climate change and food security
4. To enhance cooperation in the implementation of adaptation and mitigation measures

3. PROPOSED ACTIVITIES

The program will be implemented under the ASSP Program to strengthen capacity of the ASEAN Member States in addressing climate change and its impact on fisheries and aquaculture with the proposed activities that are in line with AIFS Framework (Strategic Thrust 6) and AFCC Framework as follows:

Component 1: Integration of climate change mitigation and adaptation strategies into the economic and social development policy framework

Activity 1: Assess the impacts of climate change on and risks for fisheries and aquaculture and contributions of fisheries sectors to climate change

Activity 2: Assess environmental impacts and risks, specifically on biological diversity

Activity 3: Assess the socio-economic impacts and risks of climate change, and identify the most vulnerable and priority geographic areas and communities for climate change adaptation and mitigation

Activity 4: Formulate food security measures to address and respond to climate change to enhance sustainable development and strengthen livelihoods

Activity 5: Incorporate climate change adaptation and mitigation measures and strategies into national development strategies, policies and programs

Component 2: Cooperation on the implementation of adaptation and mitigation measures

Activity 1: Share knowledge and experience on and promote integrated adaptation and mitigation options for agricultural production systems

Activity 2: Cooperate on the promotion of adaptation and mitigation in fisheries

Activity 3: Foster co-benefit approaches integrating environmental concerns such as biodiversity and ecosystem conservation into climate change-related measures

Component 3: Strengthening of national and regional information and knowledge sharing, communication and networking on climate change and food security

Activity 1: Synergize data bases and information systems related to climate change, fisheries and food security

Activity 2: Strengthen national and regional cooperation, coordination, consultation and communication on the impacts of and response to climate change on fisheries and aquaculture towards food security

Activity 3: Strive for coordinated or common positions on climate change, fisheries and food security

Activity 4: Strengthen regional partnerships and coordination with ASEAN partners on *climate change and food security*

Appendix 3 of Annex 7

“PROMOTING SUSTAINABLE FOOD PRODUCTION” THROUGH RESPONSIBLE FISHING TECHNOLOGIES AND PRACTICES

Concept Note

1. BACKGROUND

In the ASEAN region, the fisheries sector plays a very important role in ensuring food security of its people as it has been the main supplier of protein for the peoples' nutrient requirements in all the ASEAN Member States (AMSs). During the past several years, the growing international, regional and national demand for fish and fisheries products has led to continual development and modernization in fishing technology and has resulted in the over-exploitation of fishery resources. Due to the lack of awareness and knowledge on responsible fishing technologies and practices in fisheries in the past, the use of illegal and destructive fishing gears and methods, including non-selective fishing gear, are seriously threats to the sustainability of fishery resources and the integrity of the coastal, marine and inland water ecosystem and environment.

The current status of fishery resources and aquatic ecosystem in the ASEAN region is now a serious concern and requires the achievement of sustainability for livelihood and food security. To ensure long-term food security in the ASEAN region in accordance with the ASEAN Integrated Food Security (AIFS) Framework and the Strategic Plan of Action (SPA-FS) adopted by the ASEAN Leaders at the 14th Summit in March 2009, a program on “Promoting Sustainable Food Production” through Responsible Fishing Technologies and Practices is initiated to be implemented in the ASEAN Region. The program will strive for greater collaboration and commitment towards resource sustainability through the promotion of responsible fishing technologies and practices as ways and means to promote sustainable food production and food security.

2. OBJECTIVES

Overall objectives of the program are to build capacity and awareness of the relevant stakeholders *e.g.* government officials and fishers of the ASEAN Member States (AMSs) on responsible fishing technologies and practices towards sustainable fisheries and promoting sustainable food production for food security in the ASEAN Region. The specific objectives are as follows:

1. To improve and promote the use of selective fishing gear and practices such as by-catch reduction devices/Juvenile and Trash Excluder Devices;
2. To reduce the impacts of fishing on the coastal marine and inland ecosystem;
3. To promote the reduction of mortality of threatened species such as sea turtles and other animals due to interaction with fisheries;
4. To promote technologies in order to save energy and the use of alternative sources of energy in fisheries including safety at sea; and
5. To raise awareness on responsible fishing by production and disseminating promotional materials in collaboration and cooperation with ASEAN Member States and other organizations at the regional and international levels.

3. PROPOSED ACTIVITIES

The program will be implemented under the ASSP Program with the proposed activities as follows:

1. Research and development activities on best fisheries practices and technology transfer
 - 1.1 Conduct the review of selective fishing gear and practices
 - 1.2 Conduct demonstrations and experiments on selective fishing gear and practices including by-catch/juvenile reduction devices

- 1.3 Conduct research and study on the impacts of fishing on the aquatic environment and ecosystem such as light fishing, bottom affecting fishing, etc.
 - 1.4 Conduct study on collection of information on sea turtle mortality due to fishing operations
 - 1.5 Conduct assessment on the implementation of Turtle Excluder Devices (TEDs) and circle hooks; together with the demonstration on the use of TEDs and circle hooks; including observer training to promote those gears of sea turtle mortality due to fishing operations
 - 1.6 Conduct research and study to review and develop the design and construction of fishing gear and fishing boats to introduce and promote engineering technology for energy saving in fishing operations. The use of wind energy and alternative source of energy will be promoted in ASEAN together with the safety at sea for fishing boats and crew.
2. Awareness and capacity building on the best practices that promote livelihood and food production at the local level
 - 2.1 Raise awareness on responsible fishing technology and practices by production and disseminating promotional materials and working in collaboration and cooperation with AMSs and other organizations at the regional and international levels

Project Period: 3 years (2010-2012)

Appendix 4 of Annex 7

**STRENGTHEN FOOD SECURITY ARRANGEMENTS THROUGH FISHERIES
INTERVENTION: STRENGTHENING NATIONAL AND LOCAL GOVERNMENTS IN
THE DEVELOPMENT OF FOOD SECURITY PROGRAMS/INITIATIVES**

Concept Note

1. BACKGROUND

Food security does not mean only rice but includes nutritious food that meets people's dietary needs and food preferences for an active and healthy life. Fisheries then are recognized as it also contributes to food security. In the ASEAN region, the fisheries sector plays a very important role in ensuring food security of its people. Considering that the people in the ASEAN region are fish eaters with an average annual per capita consumption of about 26.8 kg, the fisheries sector has therefore been the main supplier of protein for the peoples' nutrient requirements. Sustainable development of the region's fisheries sector is therefore essential for the development of national economies as well as for poverty alleviation and eventually for local food security.

To ensure long-term food security in the ASEAN region in accordance with the ASEAN Integrated Food Security (AIFS) Framework and the Strategic Plan of Action (SPA-FS) adopted by the ASEAN Leaders at the 14th Summit in March 2009, and enhancing awareness on the important role and contribution of fisheries sector to food security, a program on "Strengthening Food Security Arrangements through Fisheries Intervention" is initiated to be implemented in the ASEAN Region. The program activities will be implemented under the ASEAN-SEAFDEC Strategic Partnership (ASSP) Arrangement which also aims to assist the ASEAN Member States in promoting sustainable fisheries development.

2. OBJECTIVES

Main objectives of the program are to strengthen capacity of the national and local governments of the ASEAN Member States (AMSs) in the development of food security programs and initiatives to ensure medium and long-term food security in respond to the global challenges with due support to the implementation of AIFS Framework and the SPA-FS; and to raise public awareness on the role and contribution of fisheries sector to food security.

3. PROPOSED ACTIVITIES

The program will be implemented under the ASSP Program to strengthen the national and local governments in the development of food security programs/initiatives focusing on livelihood program *i.e.* schools/villages fish pond; community-based rural aquaculture; promotion of "One Village, One Fisheries Product" or FOVOP, etc.

The following activities are proposed:

1. Capacity building to strengthen national and local food security programs/initiatives:
 - 1.1. Conduct training workshop/HRD on community-based aquaculture for the remote rural areas in the ASEAN Region
 - 1.2. Conduct training workshop/HRD on schools/villages fish pond
 - 1.3. Conduct workshop/HRD on promotion of "One Village, One Fisheries Product" (FOVOP) in all AMSs to build awareness on its Regional Guidelines/Strategy and capacity in identifying potential FOVOP products and process, and development for SME
2. Exchange of information and experiences among ASEAN Member States on the outcomes of the projects implemented in ASEAN through regional consultations in formulation and implementation of national and local food security programs/initiatives/activities;



3. Developing guidelines to facilitate national activities to develop local food security initiatives
4. Establishing network for the success cases for further expansion

Project Period: 3 years (2010-2012)

Appendix 5 of Annex 7

PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project

THE GEF TRUST FUND

* See guidelines for definition of milestones.



Submission Date: July 2010

PART I: PROJECT IDENTIFICATION
GEF PROJECT ID¹⁶:PROJECT DURATION:60
 months

GEF AGENCY PROJECT ID:

COUNTRY (IES): Cambodia, Indonesia, Philippines, Thailand, and Viet Nam

PROJECT TITLE: Establishment and Operation of a Regional System of Fisheries *Refugia* in the South China Sea and Gulf of Thailand

GEF AGENCY (IES): UNEP, (select), (select)

OTHER EXECUTING PARTNER(S): Departments of Fisheries in the participating countries; Southeast Asian Fisheries Development Center (SEAFDEC)

GEF FOCAL AREA (S)¹⁷: Multi-focal areas

GEF-4 STRATEGIC PROGRAM(S): BD-Ob1;BD-Ob.2; IW-Ob.2; IW-Ob-3

NAME OF PARENT PROGRAM/UMBRELLA PROJECT (if applicable):

A. PROJECT FRAMEWORK

INDICATIVE CALENDAR*	
Milestones	Expected Dates mm/dd/yyyy
Work Program (for FSP)	Nov. 2010
CEO Endorsement/Approval	June 2011
Agency Approval Date	Sept. 2011
Implementation Start	Oct. 2011
Mid-term Evaluation (if planned)	Sept. 2013
Project Closing Date	Sept 2015

¹⁶ Project ID number will be assigned by GEFSEC.

¹⁷ Select only those focal areas from which GEF financing is requested.

Project Objective: The overall objective of the project is to operate and expand the network of fisheries <i>refugia</i> in the South China Sea and Gulf of Thailand for the improved management of fisheries and critical marine habitats linkages in order to achieve the medium and longer-term goals of the fisheries component of the Strategic Action Program for the South China Sea.								
Project Components	I, TA, or STA ^b	Expected Outcomes	Expected Outputs	Indicative GEF Financing ^a		Indicative Co-Financing		Total (\$) c = a + b
				(M \$) a	%	(M \$) b	%	
1. Identification and Management of Fisheries and Critical Habitat Linkages in the South China Sea and Gulf of Thailand	TA	1.1 Effective operation of the regional system of fisheries <i>refugia</i> for the management of priority, transboundary, fish stocks and endangered species, including: boundaries for 23 <i>refugia</i> sites delineated; 1.2 implementation of fisheries management systems in 23 fisheries <i>refugia</i> that are consistent with the FAO Code of Conduct for Responsible Fisheries and the Regional Guidelines for Responsible Fisheries in Southeast Asia; and 1.3 fishing communities, particularly artisanal fishermen and women involved in inshore gleaning and processing, empowered to enforce agreed management rules in the fisheries <i>refugia</i> .	<ul style="list-style-type: none"> ▪ Maps and site characterizations for 23 fisheries <i>refugia</i> sites and additional 30 known fish spawning and nursery areas. ▪ Fisheries management plans for 23 <i>refugia</i> sites. ▪ Management team and community-based volunteer network at each site. ▪ 6 national and 1 regional fisheries and biodiversity conservation databases, including: status of priority fish, crustacean, and mollusk species; distribution and abundance of fish eggs and larvae; and location and management status of coastal habitats, fisheries <i>refugia</i>, MPAs, and critical habitats for threatened and endangered species. 	1,8	34	3,50	66	5,30
2. Improving the Management of Critical Habitats for Fish Stocks of Transboundary Significance	STA	2.1 Improved integration of habitat and biodiversity conservation considerations in the management of fisheries in the South China Sea and Gulf of Thailand, including: enhanced scientific understanding of fish stock and habitat links; and endorsement by Ministers of Fisheries of policy and regulatory frameworks governing the fisheries sector that incorporate measures for	<ul style="list-style-type: none"> ▪ Regional model of fish egg and larvae distribution. ▪ Regional and site level models of ecosystem carrying capacity and sustainable fishing effort levels by fishing gear type. ▪ 6 national reports on legal/institutional aspects of <i>refugia</i>. ▪ 6 sets of national guidelines for establishing and operating <i>refugia</i>. ▪ 120 quarterly national reports on fish 	1,5	40	2,25	60	3,75

		sustainable use of fish habitats and biodiversity; and 2.2 reduced use of destructive fishing gear and practices in areas of critical fisheries habitats.	stocks and habitats. <ul style="list-style-type: none"> ▪ 6 national reports on, and regulations/ordinances for, use of responsible fishing gear and practices in priority <i>refugia</i>. ▪ 1 regional and 6 national action plans for management of priority fisheries <i>refugia</i> and associated biodiversity. 					
3. Information Management and Dissemination	TA	3.1 Enhanced uptake of good practices in integrating fisheries management and biodiversity conservation in the design and implementation of regional and national fisheries management systems. 3.2 Improved community acceptance and cost-effectiveness of area based approaches to marine management. 3.3 Compiled knowledge and experiences about the project shared with other GEF projects and GEF Sec, and available on IW:LEARN.	<ul style="list-style-type: none"> ▪ Regional education and awareness centre on links between fisheries, habitats, and biodiversity, and associated regional Information and Education Campaign (IEC). ▪ Public awareness and outreach programmes on fish stock – habitat links at 23 sites. ▪ Report on indicators and standardised methods for information and data collection for <i>refugia</i> management. ▪ Development of 6 national language web portals on fisheries <i>refugia</i> and maintenance of the regional Fisheries <i>Refugia</i> Information Portal http://refugia.unepscs.org and linked to the International Waters Learn Program (IW:LEARN). ▪ Participation at the International Waters conferences; three to four experiences notes and tracked project progress reported using the GEF-V IW tracking tool. 	0,75 [With 1% of overall GEF budget in support of IW:LEARN requirements]	33	1,50	66	2,25
4. Project management				0,45	31	1,0	69	1,45
Total project costs				4,5	35	8,25	65	12,75

^a List the \$ by project components. The percentage is the share of GEF and Co-financing respectively of the total amount for the component.

^b TA = Technical Assistance; STA = Scientific & Technical Analysis.

B. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE and by NAME (in parenthesis) if available, (\$)

Sources of Co-financing	Type of Co-financing	Project
Project Government Contribution	In kind	3,315,000
Project Government Contribution	Cash	1,785,000
GEF Agency(ies)	Select	
Bilateral Aid Agency(ies)	Select	
Multilateral Agency(ies) (SEAFDEC)	Cash	3,150,000
Private Sector	Select	
NGO	Select	
Others	Select	
Total Co-financing		8,250,000

C. INDICATIVE FINANCING PLAN SUMMARY FOR THE PROJECT (\$)

	Previous Project Preparation Amount (a)[1]	Project (b)	Total	Agency Fee
			c = a + b	
GEF financing		4,500,000	4,500,000	450,000
Co-financing		8,250,000	8,250,000	
Total	0	12,750,000	12,750,000	450,000

D. GEF RESOURCES REQUESTED BY AGENCY (IES), FOCAL AREA(S) AND COUNTRY(IES)¹

GEF Agency	Focal Area	Country Name/	(in \$)		
		Global	Project (a)	Agency Fee (b) ²	Total c=a+b
UNEP	Biodiversity	Cambodia	600,000	60,000	660,000
UNEP	Biodiversity	Indonesia	600,000	60,000	660,000
UNEP	Biodiversity	Philippines	600,000	60,000	660,000
UNEP	Biodiversity	Thailand	600,000	60,000	660,000
UNEP	Biodiversity	Viet Nam	600,000	60,000	660,000
UNEP	International Waters	Regional	1,500,000	150,000	1,650,000
Total GEF Resources			4,500,000	450,000	4,950,000

¹ No need to provide information for this table if it is a single focal area, single country and single GEF Agency project.

² Relates to the project and any previous project preparation funding that have been provided and for which no Agency fee has been requested from Trustee.

PART II: PROJECT JUSTIFICATION

A. State the issue, how the project seeks to address it, and the expected global environmental benefits to be delivered:

The South China Sea and Gulf of Thailand are located at a global centre of shallow water marine biological diversity. The marine habitats of this area support fisheries that are significant in terms of food security, export income for riparian countries. Critical habitats, such as mangrove swamps, coral reefs, seagrass beds, and estuaries act as nursery areas, spawning grounds, and feeding sites for transboundary species during critical phases of their life-cycles.

Fishing has been identified by the UNEP/GEF Regional Working Groups for the Habitat Sub-Components of the South China Sea Project as a factor contributing to the continued loss of marine habitats and biodiversity in the South China Sea. Southeast Asian fisheries are characterized by high levels of coastal community dependence on fish for food and income, excessive and increasing levels of fishing effort, and diminishing availability of fisheries resources. The small size of vessels which are largely owner operated, and the multitude of landing points and land-based distribution networks poses problems of regulation and control that differ significantly from temperate fleets.

The effects of intensive inshore fishing include: declining availability and biomass of fish species of global and transboundary significance; changes in community structure due to direct reductions of populations representing specific trophic levels of the community (*e.g.* predator or prey); capture mortality of rare and endangered species; large catches of juvenile fish; and the degradation and loss of habitats and associated non-target biodiversity. The widespread use of inappropriate and destructive fishing gear and practices, such as the use of demersal trawls and push nets in seagrass areas, and the use of poisons and explosives to catch fish in coral reef areas, is of increasing concern with respect to the degradation and loss of habitats and biodiversity as a result of fishing. This situation has led to an urgent need for new and innovative fisheries management approaches in the region, particularly those aimed at limiting the loss of habitats and biodiversity, and ensuring the sustainable use of biodiversity by the fisheries sector.

The fisheries *refugia* initiative established under the UNEP/GEF project entitled “Reversing Environmental Degradation in the South China Sea and Gulf of Thailand” is unique in that it represents the first attempt to establish a regional network of integrated fisheries and habitat management areas in Southeast Asia supported by national habitat action plans (NAPs) and fisheries policies. Furthermore, regional fisheries organizations, including the Southeast Asian Fisheries Development Center (SEAFDEC) and FAO’s Asia-Pacific Fisheries Commission (APFIC) have acknowledged the unique role of the multi-lateral, intergovernmental Project “Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand” in building partnerships and enhancing communication between fisheries and environment sectors in the region for the improved management of the environmental aspects of fisheries. Fisheries *refugia* in this context are defined as “spatially and geographically defined, marine or coastal areas in which specific management measures are applied to sustain important species during critical stages of their life cycle, for their sustainable use”, and it is also compatible with FAO’s Ecosystem Approach to Fisheries (EAF).

This project aims to expand the network of fisheries *refugia* in the South China Sea and Gulf of Thailand for the improved management of fisheries and critical marine habitats. Based on the draft SAP and NAPs developed under the South China Sea Project, 5 participating countries have included establishment and management of fisheries *refugia* in national fisheries policies and plans (Cambodia, Indonesia, Philippines, Thailand, and Viet Nam). All countries have expressed the need for further scientific research, cross sectorial co-ordination, guidelines regarding the process of establishing and managing fisheries *refugia*, and establishment of mechanisms for regional exchange of information and lessons learnt. Activities in the project will focus on

ensuring adequate cross sectorial consultation between fisheries and environment departments in the designation and management of fisheries *refugia*. This is particularly important in relation to the designation by Ministries of Environment of Marine Protected Areas to ensure that such areas are congruent with habitat areas of critical significance to fish stocks. This will involve the establishment of institutional mechanisms to effect the integration of habitat and marine biodiversity conservation considerations into fisheries management.

This initiative is considered of significance because of the potential fisheries and biodiversity conservation benefits associated with effect fisheries and habitat management at the local level. Fisheries management leading to sustainable levels of exploitation in the region, due to the importance of fisheries to food security, and maintenance of livelihoods. The management approaches developed and fostered through this project may also assist in curbing the trends in regional fisheries towards over-capacity and over-exploitation; the use of destructive fishing gear and practices; habitat destruction and pollution; and illegal fishing.

The decadal rates of decline in total area of critical habitats such as seagrass, coral reefs, and mangroves in the South China Sea and Gulf of Thailand are currently estimated at 30%, 16%, and 16% respectively. Fishing is a contributing factor to the loss and degradation of particularly seagrass and coral reef habitats and the expected outcome of this project of global significance is the reduction in the rates of loss of globally significant habitats and biodiversity in priority fisheries *refugia* due to fishing.

B. Describe the consistency of the project with national/regional priorities/plans:

The FAO Code of Conduct for Responsible Fisheries recognises that, fisheries have the potential to alter the structure, biodiversity, and productivity of marine ecosystems, and recommends that innovative ecosystem-based approaches to fisheries management should be incorporated into existing regional and national fisheries management frameworks where possible. ASEAN and SEAFDEC adopted the “*UNEP/GEF Regional Guidelines on the Use of Fisheries Refugia for Sustainable Capture Fisheries Management in Southeast Asia*” in April 2006 which were published in May 2006 as part of the ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia for the implementation of the FAO Code of Conduct for Responsible Fisheries. In this connection, the 2008 Intergovernmental meeting of the SEAFDEC Council urged SEAFDEC member country governments to develop projects and initiatives aimed at ensuring more ecosystem-based approaches to fisheries management in the region.

During the period 2007-2008, the concept of fisheries *refugia* has been included in the following fisheries policies and plans of partner Member Countries as a priority tool for improved fisheries habitat management: Fisheries Law of Cambodia; South China Sea Fisheries Management Zone Plan in Indonesia; the Comprehensive National Fisheries Industry Development Plan in the Philippines; Thailand’s Marine Fisheries Policy; and the National Plan for the Management of Aquatic Species and Habitats in Viet Nam. This represents the first time regional consensus has been reached on how to build the resilience of Southeast Asian fisheries to the effects of high and increasing levels of fishing effort by enhancing the knowledge and capacity amongst stakeholders of ecosystem and fishery linkages, as a basis for integrated fisheries and ecosystem/habitat management.

Describe the consistency of the project with GEF strategies and strategic programs:

This proposal is aligned with two GEF Biodiversity Strategic Objectives, namely: Strategic Objective 1 to improve sustainability of Protected Area Systems through improvement of fishing communities livelihoods and revenue using sustainable use approaches to managing fish stocks and critical habitats; and Strategic Objective 2 on Mainstreaming Biodiversity in Production Landscapes/Seascapes and Sectors, by using the innovative concept of fish *refugia*, the project will enhance the understanding of the effectiveness of different forms of marine biodiversity

protection and how to combine conservation goals with generation of local benefits in the fisheries sector at both the national and regional levels.

The project will also contribute to the International Waters Strategic Objective 2: Catalyze multi-state cooperation to rebuild marine fisheries in the South China Sea and Gulf of Thailand Large marine ecosystems and specifically outcome 2.1 in implementing the fisheries component of the approved South China Sea Strategic Action Program. In that the *refugia concept* is an innovative approach to reconciling the demands of marine biodiversity with the often conflicting demands for enhanced fisheries products the project will contribute significantly to Outcome 2.3. The project will also contribute significantly to IW Strategic Objective 3 on portfolio learning since this is the first attempt to involve fisheries and environmental managers in jointly managing demersal fish stocks and the marine and coastal habitats upon which these stocks depend. The project will play a catalytic role in addressing transboundary water concerns by assisting countries to restore and sustain coastal and marine fish stocks and associated biodiversity that will be jointly implemented with the Biodiversity focal area and support policy, legal and institutional reforms and multiagency partnerships that contribute to WSSD targets for sustaining fish stocks.

C. justify the type of financing support provided with the GEF resources:

Co-financing for the project will come from the fisheries sector of participating governments both central and provincial governments and from the Southeast Asian Fisheries Development Center (SEAFDEC, an intergovernmental organization and the regional executing entity for the project. It is anticipated that on the ground activities in the 13 identified *refugia* will be largely funded by national governments with some GEF biodiversity funds and that the GEF IW funds will provide *inter alia* the costs of regional co-ordination, and the sharing and transfer of lessons learned

D. Outline the Coordination with other related initiatives:

This project is designed to build on achievements of the fisheries component of the UNEP/GEF Project Entitled “Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand” (South China Sea Project) in establishing a regional system of fisheries *refugia*. The achievements include *inter alia*: the publication of UNEP/GEF Regional Working Group on Fisheries’ Guidelines on the Use of Fisheries *Refugia* for Sustainable Capture Fisheries Management in Southeast Asia as part of the ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia; identification of 52 locations in the South China Sea known as critical spawning and nursery habitats for fish species of transboundary significance; regional agreement on the inclusion of 14 sites in an initial system of fisheries *refugia*; production of a regional fisheries *refugia* information base; and prioritization of an additional nine sites from the remaining 38 sites for which further information is required. The project represents the implementation phase of the fisheries component of the revised regional Strategic Action Program.

This project is linked to the network and institutions and experts of the UNEP administered Regional Seas Program and the Action Plan for the Protection and Development of the Marine and Coastal Areas of the East Asian Region. Involvement of SEAFDEC as an Executing Agency aims to establish greater political support and enhanced mainstreaming of fisheries habitat and ecosystem considerations with broader fisheries management initiatives in Southeast Asia. Such broader initiatives include ASEAN, SEAFDEC, and APFIC programs on the use of subsidies in fisheries, overcapacity, illegal and unregulated fishing, co-management, and rights-based approaches to fisheries management.

The UNEP/GEF Regional Working Group on Fisheries and SEAFDEC has noted the importance of close coordination with the proposed FAO/GEF Project on “*Strategies for Fisheries By-catch Management*”. Similarly there is regional agreement that testing the *refugia* system in the South China Sea where significant preparatory work has been undertaken will provide a sound basis for

the transfer of knowledge and experience on the use of *refugia* to fisheries habitat initiatives of the Western and Central Pacific Fisheries Commission and the Sulu-Sulawesi Marine Eco-Region program in the adjacent coral triangle area. The project will also be implemented in close collaboration with the proposed coastal fisheries management project of the SEAFDEC-SIDA mechanism for the same time period (2009-2014). The latter project has been designed to link closely with actions of the fisheries component of the revised Strategic Action Programme for the South China Sea and Gulf of Thailand which this project aims to implement.

E. Discuss the value-added of GEF involvement in the project demonstrated through incremental reasoning :

There is considerable global concern for the ecosystem effects of fishing, particularly the loss of habitats and coastal and marine biodiversity as a result of fishing. In Southeast Asia this concern is intensified by the fact that most stocks of economically important fish species are considered to be fully fished or overexploited. Increasing global demands for fisheries products; and the dependence of coastal communities on fish for food and income results in a continued increase in fishing effort. This has caused fishing down of the marine food chain in the region, coupled with an increasing dependence of the artisanal sector on small pelagic species due to declining availability of demersal species. Declining fish availability, coupled with over-capacity and the dependence of the small-scale sector on coastal fisheries for income generation has led to the use of destructive fishing practices by some fishermen in order to maintain incomes and food production in the short-term.

An emerging theme from the South China Sea Project is the need for improved management of the key threats to fish stocks and habitats from fishing. The main barriers in reducing the levels of the threats include:

- A. low level understanding amongst stakeholders, including fisherfolk, scientists, policy makers, and fisheries and habitat managers of ecosystem and fishery linkages,
- B. existing low level community acceptance of “protected” area-based approaches to marine management (Several past conservation initiatives in the region, particularly those associated with Marine Protected Areas, have promoted the complete closure of areas to fishing which is a futile if not impossible task in Southeast Asia. Such closures have been promoted in terms of potential fisheries benefits, however have often not included fishing communities and managers in the selection and management of areas.),
- C. limited information regarding fish life-cycle and critical habitat linkages, and the role marine habitats play in sustaining fisheries, and
- D. low level experience in national fisheries/environment departments and ministries in development of integrated approaches to fisheries and habitat management.

By addressing these issues and expanding the use of the fisheries *refugia* approach through the establishment and operational management of a network of fisheries *refugia* sites, the project will result in significant incremental benefit compared to the ‘no action’ option. Anticipated incremental benefits include: demonstration of sustainable use of fish stocks and habitats at fisheries *refugia* sites; improved community acceptance and cost-effectiveness of area based approaches to marine management; establishment of policy and regulatory frameworks governing the fisheries sector that incorporate measures for the sustainable use of fish habitats and biodiversity; and multi-lateral political commitments to enhance co-operation on fish stock and habitat management. It is anticipated that the experiences gained in this region will be suitable for application in other large marine ecosystems such as the Yellow Sea where over-fishing and the use of inappropriate fishing gear are significant impediments to more sustainable exploitation of fish stocks, their habitats, and associated biodiversity.

F. Indicate risks, including climate change risks, that might prevent the project objective(s) from being achieved, and if possible including risk mitigation measures that will be taken:

Successful cross-sectorial co-ordination of activities between the fisheries and environment sectors in the participating countries is a key assumption. Many past marine protected areas in the region have been promoted in terms of their potential to improve the state of fisheries and their habitats, but have rarely included mechanisms to ensure the effective integration of fisheries considerations into management. In contrast, fisheries departments and ministries largely focus on achieving sustainable yields from fish stocks in the light of high community dependence on, and participation in small-scale fisheries. Experience in the South China Sea Project suggests that the risks that this assumption will not be met seems small as the fisheries *refugia* concept has provided an adequate platform for building the partnerships and enhancing communication between the environment and fisheries sectors to date. The *refugia* concept was used successfully in 2006 to resolve a long running conflict between the fisheries and environment sectors in the Philippines regarding the utilisation of fish stocks in areas of critical habitats in the Visayan Sea. Past experiences suggest therefore that this assumption will be met.

A second assumption is that small-scale fishing communities will support the initiatives and interventions proposed. At present many small-scale fishing communities, fisheries managers, and local government officials in the region equate area-based (zoning) approaches to fisheries management as the equivalent of no-take Marine Protected Areas. The latter are often viewed as unacceptable at the community level since they are rarely designed in locations of importance to the life-cycle of important fish species and neither improves fish stocks, nor the community's income. The net result of such activities has been the loss of fishing areas for small-scale fishers and non-compliance with fisheries management measures in the "protected" areas. The outcomes of extensive community and stakeholder consultations in the participating countries during 2005 and 2006 suggest that the *refugia* concept is well accepted by small-scale fishing communities and local officials. To date fishing communities in Cambodia, Indonesia, Philippines, Thailand, and Viet Nam have expressed their strong support for the establishment and management of fisheries *refugia* in areas of critical fisheries habitats. Achievements at pilot fisheries *refugia* sites in the Philippines, Thailand, and Viet Nam to date indicate that this assumption will be met.

A further assumption is that the national governments will take action to implement management plans for critical habitat areas of specific fisheries *refugia*. It is likely that this assumption will be met since all governments adopted habitat specific National Action Plans in support of the regional Strategic Action Program and the further development of the system of fisheries *refugia* is part of the agreed SAP.

G. Describe, if possible, the expected cost-effectiveness of the project:

The project intends to build on existing investments and the policy and scientific basis for the regional system of fisheries *refugia* established through UNEP/GEF South China Sea Project. The development of the fisheries *refugia* concept as a tool for integrating fish stock and habitat management was undertaken by the UNEP/GEF Regional Working Group on Fisheries in close collaboration with SEAFDEC, FAO, IUCN, and World Fish Center during the period 2003-2008.

The concept was elaborated and refined, and priority *refugia* sites identified, based on: the outcomes of regional and national level expert and fishing community consultations; national reports on fisheries, mangroves, coral reefs, seagrass, and wetlands from the seven participating countries of the South China Sea project; 135 habitat site characterizations prepared during the SCS Project; the SCS meta-database and GIS; and information contributed directly by fisheries and habitat focal points. This has been supported by three regional training courses and 12 national training seminars on the scientific and management aspects of operating the regional *refugia* system.

Cost effectiveness was a key criterion for development of the *refugia* initiative. The concept aims to improve the use of area-based approaches to fish stock and habitat management, whilst overcoming the problems associated with the emphasis on no-take Marine Protected Areas in the region. The latter include low fishing community acceptance, and high costs in terms of displacement of fishermen and enforcement. The fisheries *refugia* initiative addresses the present problems by drawing on fisheries management concepts that are easily understood at the fishing community level and emphasise the sustainable use of fisheries resources and their habitats rather than the prohibition of fishing.

There is consensus amongst the fisheries and habitat specialists of the SCS Project that the *refugia* concept represents an innovative approach for building fishing community support for area-based approaches to fisheries and habitat management, through which fish stock and habitat conservation objectives can be achieved simultaneously. The focus of the project on establishing operational management at 23 priority fisheries *refugia* sites will enable the efficient timing of site level activities required to ensure the transfer of lessons-learned between and amongst sites, and evaluation of the effectiveness of project interventions in achieving the medium and longer term resource and institutional objectives of the *refugia* system.

H. Justify the comparative advantage of GEF agency:

The project represents implementation of one component of the Strategic Action Program for the South China Sea that was developed through the UNEP/GEF project entitled “*Reversing environmental degradation trends in the South China Sea and Gulf of Thailand*” and will build on the network of institutions, organizations and individuals responsible for the development of the *refugia* concept during execution of that project. SEAFDEC as the regional executing agency has collaborated with UNEP in the development and dissemination of the concept of the fisheries *refugia* and is the only regional fisheries body encompassing the South China Sea and Gulf of Thailand.

UNEP has been recognized by regional and International fisheries organizations as the appropriate organization to implement initiatives in Southeast Asia that focus on the integration of fisheries and environment considerations due to it being the only United Nations program whose core business is the environment. UNEP is also placed well to facilitate the multi-stakeholder, intergovernmental consultations required to ensure the close cross-sectorial consultation between fisheries and environment departments in the designation and management of fisheries *refugia*. This is particularly important in relation to the designation by Ministries of Environment of Marine Protected Areas to ensure that such areas are congruent with habitat areas of critical significance to fish stocks. This will involve the establishment of institutional mechanisms to effect the integration of habitat and marine biodiversity conservation considerations into fisheries management. UNEP has demonstrated its ability to achieve this and is evidenced by the Intergovernmental regional guidelines on fisheries *refugia* adopted by ASEAN and SEAFDEC.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY (IES)

A. Record of endorsement of GEF operational focal point (s) on behalf of the government(s):

(Please attach the country endorsement letter(s) or regional endorsement letter(s) with this template).

NAME	POSITION	MINISTRY	DATE (MONTH, DAY, YEAR)
Nguyen VAN TAI,	Deputy Director General Department of Environment ,	Ministry of Natural Resources and Environment, Vietnam	
Agus PURNOMO,	Special Assistant Minister for International Environmental Issues and Partnership	Ministry of Environment, Indonesia	
Analiza TEH,	Assistant Secretary Department of Environment and Natural Resources Foreign Assisted and Special Projects Office	Department of Environment and Natural Resources Philippines	
Saksit TRIDECH,	Permanent Secretary Office of the Permanent Secretary	Ministry of the Natural Resources and Environment Thailand	
HEAL, Lonh	Technical Director General	Ministry of Environment Cambodia	

B. GEF agency (ies) certification

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation.

Agency Coordinator, Agency name	Signature	Date (Month, Year, Day)	Project Contact Person	Telephone	Email Address
Maryam Niamir- Fuller Director, UNEP Division of GEF Coordination					

“IMPROVED FISHERIES MANAGEMENT THROUGH AN ECOSYSTEMS APPROACH TO FISHERIES BY DEVELOPMENT AND MANAGEMENT OF REFUGIA AND MARINE PROTECTED AREAS IN THE EASTERN GULF OF THAILAND”

Concept Note

Title of the action:	Improved Fisheries Management Through an Ecosystems Approach to Fisheries by Development and Management of <i>Refugia</i> and Marine Protected Areas in the Eastern Gulf of Thailand
Lot N°	Lot 8: Fisheries
Location(s) of the action: - specify country(ies), region(s) that will benefit from the action	(Eastern) Gulf of Thailand – Cambodia, Thailand and Vietnam
Total duration of the action (months):	48 months
Amount (in EUR) requested from the European Commission	1,200,000 Euro
Objectives of the action	<p>The development objective (overall objectives) is sustainable fisheries and healthy ecosystems in eastern Gulf of Thailand (Cambodia and bordering provinces in Vietnam and Thailand) and poverty eradicated along the coasts of the eastern Gulf of Thailand</p> <p>The objectives are to have:</p> <ul style="list-style-type: none"> • Capacity built up for the establishment of a well managed system of MPAs and fisheries resources conservation areas (<i>refugia</i>) for the management of commercially important fish stocks, endangered species habitats in the eastern Gulf of Thailand • Plans for the management of illegal and environmentally destructive fisheries coordinated among the Gulf of Thailand countries to reduce pressure on the ecosystems combined with programmes to identify alternative income to alleviate poverty • Experiences and knowledge shared about the implementation of ecosystems based fisheries among institutions and communities in Cambodia, Vietnam and Thailand as well as at the ASEAN regional level • A process supported to establish bi- and/or trilateral agreements on the management of fisheries and habitats (ecosystems) among Cambodia, Vietnam and Thailand
Target group(s) ¹⁸	<ul style="list-style-type: none"> • Fishing communities and fisher-folk (Cambodia, Thailand and Vietnam) • NGO staff • Staff from local and central government agencies (fisheries, environment) • Staff from international and regional organisations
Final beneficiaries ¹⁹	Coastal fishing communities and fisher-folk

¹⁸ “Target groups” are the groups/entities who will be directly positively affected by the action at the action purpose level.

¹⁹ “Final beneficiaries” are those who will benefit from the action in the long term at the level of the society or sector at large.

<p>Estimated results</p>	<ul style="list-style-type: none"> • Enhanced cooperation mechanism and information/experience exchange promoted within countries and between countries in the sub-region. • Better understanding and enhanced capacity of the ecosystem approach to fisheries and demonstrated added value of this concept in the fisheries management and the role of MPAs in the process. • A series of capacity building events, on-site training and awareness raising activities, including alternative livelihood have been provided to all stakeholders • Capacity, strengthened to monitor and record active fishing capacity in small scale/coastal fisheries, including incidences of illegal (IUU) fisheries by large-scale vessels in coastal waters. • Drafting of plans for ecosystems based management systems in Cambodia, Vietnam and Thailand initiated • A sub-regional framework, based on nationally implemented management areas (MPAs, <i>refugias</i>), identified in the Gulf of Thailand for trans-boundary resource management • Consultative workshops organised to share the knowledge and experiences of the implementation of ecosystem approach to fisheries in the region.
<p>Main activities</p>	<ul style="list-style-type: none"> • Promotion of and capacity building for Ecosystems based management, including MPAs and designation of <i>refugia</i> • Identifying alternative livelihoods for coastal communities to reduce fishing pressure and poverty alleviation • Addressing fishing capacity by records of vessels and gear to reduce illegal and destructive fishing • On-site training and training of trainers in border areas • Promotion of bi- and trilateral agreements on fisheries and habitat management • Studies and research as needed to support the processes indicated in the proposal

PROJECT CONCEPT NOTE

Project Title: Strategies for trawl fisheries By-catch management (REBYC-II CTI)
Prospect Funding Agency: xxx
Lead Department: Training Department
Duration: 2011

1. BACKGROUND/INTRODUCTION

The Coral Triangle region of Southeast Asia is one of the world's most biologically diverse, economically productive and potentially vulnerable marine zones. As a result of increasing populations and exploitation pressures, growing threats from pollution and major ecosystem change are a particular concern in the region. Also – as more widely in the global context – the untargeted capture of fish and non-fish species, commonly called by-catch and discards, is an increasing concern. By-catch includes fish, turtles, marine mammals, and corals and other seabed fauna and flora. This part of the catch tends to be poorly monitored and not managed but could have an important impact on fishery resources, habitats and ecosystems. In some fisheries and regions, there is an increasing trend towards retention of the by-catch consisting of juveniles and small-sized fish for use as food for human consumption or for utilization as aqua feed. This is therefore a complex issue, requiring resource and biodiversity aspects to be tackled alongside human needs and involving a mix of policy, technical and community support measures.

The SEAFDEC/TD collaborative with FAO/UNEP/GEF implement global project “Reduction of Environmental Impact from Tropical Shrimp Trawling through the Introduction of By-catch Reduction Technologies and Change of Management” (2002-2008) was completed and successes through gave benefits to SEAFDEC Member Countries. Therefore the collaborative with FAO in the continue project on “Strategies for trawl fisheries By-catch management (REBYC-II CTI)” from 2011 to 2014 should be implemented to sustainable fisheries resources and healthy marine ecosystems in the Coral Triangle and Southeast Asian waters by reduced by-catch, discards and fishing impact on biodiversity and the environment including **effective** public and private sector partnership for improved trawl and by-catch management and practices that support fishery dependent incomes and sustainable livelihoods.

2. MAIN OBJECTIVES

Effective public and private sector partnership for improved trawl and by-catch management and practices that support fishery dependent incomes and sustainable livelihoods

3. PROJECT DESCRIPTION

The project is structured on four interrelated components;

3.1 The Policy, legal and institutional frameworks component will work towards the establishment of national or area specific trawl fisheries by-catch management plans and building institutional capacity for their implementation. The need for adequate legislation and regulations to support the implementation of improved management measures will also be addressed. At the regional level, a by-catch policy/strategy will be developed and project countries will be encouraged to adopt the International Guidelines on By-catch Management and Reduction of Discards.

3.2 The Resource management and fishing operations component will lead to the adoption of more selective fishing gear and practices, zoning of fishing areas and development of spatial-

temporal closure management measures, and better data on number of vessels and recommendations for fishing effort and capacity management. The management measures will be supported by the identification of incentive packages that promote more responsible fishing. The results from this component will inform the regional by-catch policy/strategy and the national and/or area specific trawl fisheries by-catch management plans.

- a. The Information management and communication component will include by-catch data collection (at landing sites and onboard vessels), mapping of fishing grounds, establishment of socio-economic monitoring procedures, and means for communicating by-catch data and information. Standardized methods for by-catch data collection will be promoted across project countries.
- b. The Awareness and knowledge component will address the awareness of and knowledge on trawl fisheries by-catch management issues and how they relate to sustainability, and what measures that are available to make fishing more responsible. Private sector/fishers, policy makers, fisheries managers, officials, extension officers and NGOs will be offered training and workshops to enhance their knowledge on best management practices and responsible fisheries.

4. EXPECTED OUTPUTS

- Agreed regional by-catch policy/strategy – that is in line with the forthcoming International Guidelines on By-catch Management and Reduction of Discards – is adopted by at least one relevant organization in the project region, and national or area specific trawl fisheries by-catch management plans are adopted covering at least 50% of all trawlers in the project countries.
- Measures that manage by-catch and reduce discards, and thereby improve fisheries resources, are implemented for 25% of all trawlers in the project countries. In these fisheries (covered by improved by-catch management measures), by-catch has been reduced by 20% compared to baseline data in year 1 of the project.
- Standardized data on at least 3 key by-catch and habitat indicators are available in all project countries and inform trawl fisheries and by-catch management planning and implementation at national and regional levels.
- Enhanced understanding of responsible fishing by private sector/fishers, fisheries managers and decision-makers are supporting participatory management arrangements in all project countries.
- Institutional arrangements and processes for public and private sector partnerships are in place and supporting trawl fisheries by-catch management in all project countries.
- The role of by-catch in trawl profitability is understood and measures for how to ensure long-term economic sustainability of trawl fisheries are identified and incorporated into trawl fisheries by-catch management plans in all project countries.
- Incentives for trawl operators to reduce by-catch are defined and implemented in all project countries and best practices communicated within relevant regional frameworks.

5. PROGRESS AND STATUS

The project will start in the year 2011

OUTLINE OF JAPANESE TRUST FUND

In 2010, Japanese Trust Fund (JTF) projects have been implemented under two programs; the “Promotion of sustainable use of shared stocks in Southeast Asia (JTF II)” program and the “Promotion of sustainable aquaculture and resource enhancement in Southeast Asia (JTF V)” program. In 2011, JTF projects will be implemented under the same programs.

I. OUTLINE OF JAPANESE TRUST FUND II PROGRAM

“Promotion of sustainable use of shared stocks in Southeast Asia”

1. OBJECTIVES OF THE JTF II PROGRAM

Southeast Asia is the region with the highest fishery consumption per capita among other developing regions. Thus, it has urgent need to prepare the appropriate fishery resource management scheme and promote the effective utilization to ensure the sustainable fishery resource use for the stable food supply. However, in additions to the poor handling techniques and less-developed resources, the region is inhibited the effective resource use by tangling of each country’s EEZs and many shared stocks swimming across the borders. In this regards, the project conducts research for stock evaluation and development of new fishery grounds and also promote the effective use of unutilized fishery resource.

At the same time, international fishery related issues have been activating their discussions especially in the by-catch, WTO fishery subsidies and listing of commercial aquatic species in CITES Appendices those are concerned to inhibit the sustainable fishery resource use. Therefore, the project also support Southeast Asian countries for their recognition of the backgrounds and their impact to the domestic industries with appropriate respondents through enhancement of policy planning capacity with information collection and dissemination, scientific survey and effective PR methods.

In addition, IUU fishing is hindering the resource conservation management, so there is an urgent need to establish a scheme to manage and certify fisheries products, including development of the model scheme of fishing vessel registration as IUU fishing related countermeasures.

2. SUMMARY OF PROGRAM COMPONENTS

Component 1) Information Collection for Sustainable Pelagic Fisheries in the South China Sea and Andaman Sea

Conduct the tagging survey for economically important small pelagic fishes to promote the sustainable fishery resource use in the region. Along the survey and data collection, implement the tagging research training for the human resource development, and development of regional database for management.

Component 2) Development of Demersal Fishery Resources Living in Untrawlable Fishing Ground in the Southeast Asian Region

Promote the sustainable deep sea fishery development in the region, through conducting the research to identify the impact of deep sea fishery to its environment, the development the eco-friendly fishery gears and the training for fishery ground development. In addition, promote the effective fishery resource use through handling technique training on-board to reduce the post-harvest loss.

Component 3) Fishery Management of Shared Stocks in Southeast Asian Waters

Promote the fishery management of shared stocks in the region through conducting the survey to reveal the fishery operation, and promote right-based fisheries and co-management.

Component 4) Research for the Safety of Fisheries Products in the Southeast Asia

Conduct trainings for biotoxine analysis of fishery products to improve the food safety of the region. Also facilitate the initiative of each country for analyzing the concentration of biotoxine.

Component 5) Information Collection about International Fisheries Issues

Information collection and dissemination of international fisheries related issues such as trade and environment. Sighting survey of cetacean species and promotion of responsible fishery conduct and enhance the PR ability.

Component 6) Promotion of Sustainable Fisheries and IUU Fishing Related Countermeasures in the Southeast Asia

Establish a scheme to manage and certify fisheries products through information gathering, support for implementation, HRD and strengthening networks for sustainable fisheries and IUU fishing related countermeasures. (A new component from the year 2011)

3. ABSTRACT OF A NEW COMPONENT UNDER JTF II PROGRAM**Background**

It has been pointed out that IUU (illegal, unreported and unregulated) fishing is hindering the resource conservation management, and now EU requires certification records (which shows the product is not acquired by IUU fishing) when EU imports fisheries products. There is an urgent need to establish a scheme to manage and certify fisheries products.

There are a number of small scale fisheries in the Southeast Asia, so in particular development of the model scheme of fishing vessel registration and formulation of the catch certificated systems will be required to improve IUU fishing related countermeasures.

Based on these situations, aiming at establishing and promoting integrated resource management schemes in Southeast Asian Waters, a new component "Promotion of Sustainable Fisheries and IUU Fishing Countermeasures in the Southeast Asia" will be added under JTF II from 2011 till 2015.

Purpose of a new component

To strengthen the ability to deal with sustainable fisheries and IUU fishing related countermeasures through promoting the registration system of fishing vessels, catch certificated systems, integrated fishing or resource management model schemes in the region, etc.

Titles of a new component and new projects in 2011

Title of Component: Promotion of Sustainable Fisheries and IUU Fishing Related Countermeasures in the Southeast Asia

Project 1: Improvement of Information Gathering System for IUU Fishing Related Countermeasures in the Southeast Asia (TD/SEC)

Project 2: Promotion on Fishing License, Boats Registration System and Port State Measures (TD/MFRDMD)

Project 3: Human Resources Development for Sustainable Fisheries (TD)

Project 4: Strengthening SEAFDEC Networks for IUU Fishing Related Countermeasures (SEC)

4. PROJECTS UNDER JTF II PROGRAM IN 2011

LIST OF PROJECT (13 PROJECTS)

JTF210-C101	Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea
JTF210-C102	Development of Regional Database for Fishery Management
JTF210-C201	Deep Sea Fisheries Resources Exploration in the Southeast Asia
JTF210-C202	Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses
JTF210-C301	Information Collection of Highly Migratory Species in Southeast Asian Waters
JTF210-C302	Promotion of Right-based Fisheries and Co-management towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management
JTF210-C401	Chemical and Drug Residues in Fish and Fish Products in the Southeast Asia
JTF210-C501	Assistance of Capacity Building in the Region to Address International Trade Related Issues
JTF210-C502	Cetacean Research in Southeast Asian Waters
JTF210-C601	Improvement of Information Gathering System for IUU Fishing Related Countermeasures in the Southeast Asia
JTF210-C602	Promotion on Fishing License, Boat Registration System and Port State Measures
JTF210-C603	Human Resource Development for Sustainable Fisheries
JTF210-C604	Strengthening SEAFDEC Network for Sustainable Fisheries and IUU Fishing Related Countermeasures

Remark: Projects from components 1 to component 5 under JTF II will terminate till the SEAFDEC year 2012.

II. OUTLINE OF JAPANESE TRUST FUND V PROGRAM

“Promotion of sustainable aquaculture and resource enhancement in Southeast Asia”

1. OBJECTIVES OF THE JTF V PROGRAM

Southeast Asian region is the biggest exporter of fishery products including aquaculture commodities in the world, thus ensuring the sustainable fisheries is very important to secure not only the regional but also worldwide demands including Japan as one of the largest consumer. For this purpose, SEAFDEC has been conducted Trust Fund Program “Environment-Friendly Regional Development in Southeast Asia” with the support of Fisheries Agency of Japan from 2005-2009. Regarding the aquaculture and resource enhancement, the program conducted development of technologies and human capacity building for sustainable aquaculture, stock enhancement for threatened species of international concern and development of fish disease surveillance system. However, as reflected in the remarkable increase of culture production in the Southeast Asian region in the last decade, there is a further growing demand for aquaculture and replenishment of natural resources which has been over-exploited so far. In addition, marine and inland habitat have deteriorated significantly as a result of continued and increasing human activities, so rehabilitation of fisheries resources and habitat/fishing grounds has been paid attention to small-scale fishers in the region. These require promotion of sustainable and region-oriented aquaculture practices, environment-friendly resource enhancement, preservation of critical fishing grounds, and accelerating awareness and capacity-building in fish health management as essential activities. In addition, a new challenge is becoming a pressing issue to respond to growing and worldwide concern for the food safety. Thus, the present program aims to promote sustainable aquaculture and resource enhancement in the region with the region-oriented and environment-friendly manners by further promoting knowledge and technologies achieved in the last program.

2. SUMMARY OF PROGRAM COMPONENTS

1) Promotion of Sustainable and Region-Oriented Aquaculture Practices

Promote the sustainable aquaculture in the region through development of seed production technology, environment-friendly feed development and culture management technologies, establishment of socio-economically affordable aquaculture, and technology extension and demonstration.

2) Promotion of Environment-Friendly Resource Enhancement

Promote the resource enhancement of CITES listed species such as seahorses and Napoleon wrasse, and regionally over-exploited species like sea cucumber, donkey's ear abalone and mud crab through refinement of hatchery and nursery technologies, stock releasing programs as well as assessment of socioeconomic strategies and implementation of training courses.

Identify and managing the nesting and migrating route of sea turtle which is listing species of Appendix I to contribute the conservation, including information collection by tagging and satellite telemetry, etc.

3) Preservation of Critical Fishing Ground

Promote the fishery rehabilitation for the stock enhancement of the region through conducting training course for capacity building on rehabilitation of habitat/fishing grounds, technical assistance by pilot project on diagnosis of fishery ground and its rehabilitation with artificial reefs.

4) Food Safety of Aquaculture Products

Improve the food safety of aquaculture products in the region through surveillance and monitoring of the chemical contaminants in aquaculture products and feeds, investigation of the status of antibiotics and chemicals usage in aquaculture, and promotion of food safety awareness from farm to fork as well as establishment of guidelines on the proper usage of antibiotics and chemicals for farmers.

Accelerate awareness and capacity-building in fish health management to facilitate controlling fish disease outbreaks, improve the production efficiency and sustainability of the aquaculture industry, and produce information relevant to diagnostics, surveillance and control measures for various diseases.

Improve the food safety of aquaculture products in the region by supporting the initiative of ASEAN countries to promote the aquaculture food traceability system and implementing capacity buildings.

3. PROJECTS UNDER JTF V PROGRAM IN 2011

LIST OF PROJECTS (7 PROJECTS)

JTF511-C101	Promotion of Sustainable and Region-oriented Aquaculture Practices
JTF511-C201	Resource Enhancement of Internationally Threatened and Over-exploited Species in Southeast Asia through Stock Release
JTF511-C202	Research and Management of Sea Turtles in Foraging Habitat in the Southeast Asian Waters
JTF511-C301	Rehabilitation of Fisheries Resources and Habitat/Fishing Grounds for Resources Enhancement
JTF511-C401	Traceability Systems for Aquaculture Products in the ASEAN Region
JTF511-C402	Accelerating Awareness and Capability-building in Fish Health Management in Southeast Asia
JTF511-C403	Food Safety of Aquaculture Products in Southeast Asia

Remark: Projects will be implemented from the year 2010 to the year 2014 (SEAFDEC implementation year)

STATEMENT

By Dr. Simon Funge-Smith, FAO Regional Office for Asia and the Pacific

FAO cooperative activities with SEAFDEC during 2010 have been various, with key examples being the near completion of the project proposal for GEF funding of the Reduction of By-Catch Phase II, project.

- FAO has recently been requested by the Global Environment Facility under its stocktaking an exercise for the East Asian Seas, to become more engaged in fisheries related activities in the East Asian seas region.
- In this regard it is highly likely that FAO will start to develop some fishery related complements of projects for GEF support. These may be linked to the GEF program that SEAFDEC is currently developing with UNEP or may even be developed directly with SEAFDEC should she be interested in such collaboration.
- Potential areas for cooperation are related to Ecosystem Approach to management of fisheries and aquaculture, fishing capacity management, improvement of the management of coastal fisheries, post harvest and value chain improvement.

SEAFDEC and the Asia-Pacific Fishery Commission (APFIC) have cooperated in a number of regional consultative workshops as well as the APFIC Regional consultative Forum Meeting concluded in September.

- Upcoming APFIC/FAO activities in 2011 include a regional consultative workshop on climate change in fisheries and aquaculture and regional consultative workshop, with associated training on the tools and effective use of fishery assessments for fishery management.
- APFIC and BOBLME are also supporting the program of the SEAFDEC June 2011 Fish for the People Conference

The Bay of Bengal Large Marine Ecosystem project that is pleased to have SEAFDEC Member Countries Indonesia, Thailand, Myanmar and potentially Malaysia participating, has already collaborated in several activities during 2010. FAO and BOBLME are looking forward to further BOBLME-SEAFDEC collaboration in 2011 in the following areas:

- An extension into (four) South Asian countries of the SEAFDEC Program on Improvement of Fishery Statistics and Information for Planning and Management of Fisheries. Development of a training course, fully funded by BOBLME.
- Promotion of Andaman Sea Sub-regional cooperation through increasing public awareness of the existence and significance of the ecosystems, adding value to ongoing SEAFDEC/SIDA program. Linked to this is an initiative for the focal area use of MPAs/fish refugia in fisheries management, and integration of fisheries and habitat management, and of course assuring India (Andaman/Nicobar) participation
- BOBLME has a commitment to address climate change adaptation type activities, but similar to SEAFDEC is currently trying to develop a plan for how to implement this. BOBLME would be happy to engage further on this.
- There is an ongoing interest for the greater use of the SEAFDEC research vessels to undertake surveys, with the possibility to encourage greater cooperation with Bay of Bengal countries such as India, to undertake a more comprehensive resource assessment program in the Bay of Bengal region.
- BOBLME is currently developing an Ecosystem approach to fisheries management training course (with Bogor University) and is looking for partnership with SEAFDEC to undertake comprehensive capacity building and training. This would also have spin-off benefits to other SEAFDEC Member Countries which are not participating in the BOBLME.

The RFLP is a Spanish funded program, working in the SEAFDEC Member Countries of Vietnam, Cambodia, Philippines and Indonesia.

- RFLP Program is already undertaking activities related to safety at sea, building on the recently concluded FAO SIDA program in south Asia, and so a possible linkage to the Japan trust fund.
- RFLP is working on livelihoods improvement through a variety of measures that are highly compatible to the SEAFDEC programs on FOVOP, aquaculture development in coastal areas, the improvement of community management of resources and restoration of coastal habitats.
- The RFLP is also working with Philippines and potentially Indonesia in the area small pelagic assessment

As of November 2010, the Port State Measures agreement had 23 signatures (incl. Indonesia, <http://www.fao.org/Legal/treaties/037s-e.htm>). The agreement is open for signature at FAO until 21 November 2010, and under Article 29 of the Agreement it shall enter into force thirty days after the date of deposit with the Director-General of the twenty-fifth instrument of ratification, acceptance, approval or accession.

CLOSING REMARKS

By Dr. Chumnarn Pongsri, SEAFDEC Secretary-General

Distinguished Members of the SEAFDEC Program Committee, SEAFDEC Senior Officials, Representatives from our Collaborating Partners, Ladies and Gentlemen, Good Evening!

After three long days of deliberation on the SEAFDEC programs and important issues we have come to the end of the Thirty-third Meeting of the SEAFDEC Program Committee. On behalf of the SEAFDEC Secretariat and Departments, I would like to express our sincere gratitude to all participants for providing us with your ideas, comments and suggestions on the various points discussed, and for all the other contributions that make this three-day meeting achieve its objectives. I would also like to thank our staff from the Training Department and the Secretariat who worked hard to make this Meeting successful.

In the course of our meeting, a wide range of issues on the SEAFDEC programs have been discussed especially on the appropriateness and effectiveness of their implementation in response to the needs and interests of the Member Countries. The outcomes and agreed recommendations for specific programs at this Meeting will therefore be endorsed to the FCG/ASSP Meeting which will be convened from tomorrow until Saturday. After further deliberations, the suggested changes in the implementation of the programs will be presented during the next Meeting of the SEAFDEC Council for final approval and inclusion in the overall ongoing activities of SEAFDEC. I am confident that the issues considered in following-up both the program and non-program matters of this Meeting will contribute to the satisfaction of all concerned.

Finally, I would like to offer my heartfelt thanks to you once again for all your contributions. For some of you who will leave before the FCG Meeting, I wish you have a safe journey back home. To the rest, I will see you during the FCG Meeting which will start tomorrow. With that note, I now declare the Thirty-third Meeting of the Program Committee closed. Thank you.