

SEAFDEC Annual Report 2008



Southeast Asian Fisheries Development Center

Preparation and Distribution of this Document

The SEAFDEC Annual Report 2008 was prepared by the Secretariat of the Southeast Asian Fisheries Development Center (SEAFDEC), in collaboration with SEAFDEC Departments namely, the Training Department (TD), the Marine Fisheries Research Department (MFRD), the Aquaculture Department (AQD), and the Marine Fishery Resources Development and Management Department (MFRDMD). The document is distributed to SEAFDEC Member Countries, its Departments, partner agencies and other fisheries-related organizations, and public to promote the activities of the Center.

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Executive Summary

SEAFDEC programs and activities implemented in the year 2008 were formulated and implemented in-line with the policy directives and priority actions guided by the SEAFDEC Member Countries. The programs were categorized into: Departmental Programs (10 programs), ASEAN-SEAFDEC Strategic Partnership FCG Programs (21 programs) and Other Programs (6 programs); and could be grouped into various scopes, i.e. responsible fishing technologies and practices; exploration and monitoring of fishery resources, and its utilization; management for sustainable fisheries; conservation and management of aquatic species under international concerns; post-harvest technology and safety of fish and fish products; sustainable aquaculture development; fisheries for food security and poverty alleviation; activities in response to the emerging needs and concerns; and activities in enhancing SEAFDEC visibility and human capacity development.

In 2008, the SEAFDEC Council during its 40th Meeting also endorsed the establishment of the Regional Advisory Committee for Fisheries Management in Southeast Asia (RAC) as a subsidiary body of the SEAFDEC Council. The First Meeting of RAC was therefore organized and came up with the Regional Policy Recommendations to Improve Fisheries Management in Southeast Asia (2008) for submission to the 41st Meeting of the SEAFDEC Council in early 2009 for consideration.

Throughout the year, SEAFDEC also collaborated with several international/regional organizations as well as with non-Member Countries in the implementation of its activities. These include the ASEAN Foundation, the Asia-Pacific Fisheries Commission, the Association of the Southeast Asian Nations, the Australian Centre for International Agricultural Research, the Ecuador's National Institute of Fisheries, Faculty of Fisheries, Kagoshima University of Japan, the Food and Agriculture Organization of the United Nations (FAO), Fisheries Resources Monitoring System (FIRMS) and Coordinating Working Party (CWP) for Fishery Statistics, the Japan International Cooperation Agency (JICA), the National Fisheries University of Japan, the North Carolina State University (USA), the Swedish International Development Cooperation Agency, and the United Nations Environmental Programme/Global Environmental Facility.

This SEAFDEC Annual Report 2008 has summarized the achievements of activities implemented in 2008; and the planned activities and the challenges for SEAFDEC in supporting the Member Countries in their efforts to achieve sustainable development of fisheries, balancing the contributions from fisheries to national economy development as well as food security and people's livelihood, and safeguarding the countries' interests and welfare within the emerging global concerns and requirements.

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About SEAFDEC

The Southeast Asian Fisheries Development Center (SEAFDEC) is an autonomous inter-governmental body established in 1967. SEAFDEC was mandated to develop fisheries potential of the Southeast Asian region by rational utilization of the resources to provide food security to the people through transfer of new technologies, and to conduct research and information dissemination activities. SEAFDEC comprises 11 Member Countries: Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. The Center operates through the Secretariat located in Thailand and has four technical Departments, namely the Training Department, the Marine Fisheries Research Department, the Aquaculture Department, and the Marine Fishery Resources Development and Management Department.



SEAFDEC Secretariat



SEAFDEC/TD

The Secretariat

The Secretariat coordinates and oversees the general policy and planning of the Center and acts as the focal point for channeling and implementing the decision and resolutions of the SEAFDEC Council of Directors. In addition to its mandate to organize regular meetings to obtain directives and guidance from the Member Countries for the operation of SEAFDEC, the Secretariat also organizes technical consultations and meetings on issues as suggested by the Member Countries, generates regional fisheries policy suggestions and coordinates the implementation of activities by all Departments towards a common goal.



SEAFDEC/MFRD



SEAFDEC/AQD

The Training Department (TD)

Established in Thailand in 1968, TD has been focusing on the development of modern fishery techniques to aid regional fisheries in a more sustainable approach through the promotion of responsible fishing technologies and practices, exploration of resources, and advancing the coastal fisheries management approach. With the new TD Strategic Plan endorsed in 2006, TD's structure and activities have been adjusted to emphasize on the promotion of coastal fisheries management to ensure responsible resource utilization and sustainable livelihoods of coastal communities;



SEAFDEC/MFRDMD

and the promotion of off-shore fisheries through the development of best fishing practices and energy optimization to ensure stable supply of food fish and reduce fishing pressure in coastal areas.

The Marine Fisheries Research Department (MFRD)

MFRD was established in Singapore in 1969, and is responsible for promoting, undertaking, and coordinating research in fisheries post-harvest technology and furthering the development of the fish processing industry in the region. Its task includes research and development of fishery post-harvest technology and practices, such as fish processing technology to maximize the utilization of harvested fish and enhancing the quality of fishery products. MFRD also develops technology-based analytical methods to assess seafood safety and quality and publishes several manuals as reference materials for Member Countries.

The Aquaculture Department (AQD)

AQD was established in the Philippines in 1973, and has been carrying out research, technology verification, training and information dissemination on a wide range of aquaculture disciplines, including broodstock management and seed quality improvement, promotion of responsible and environment-friendly aquaculture, diagnosis and control of aquaculture diseases, aquaculture for stock enhancement, and culture of aquatic species under international concerns. The aquaculture commodities covered by AQD include fishes, shrimps, mud crabs, molluscs, and seaweeds. In addition, AQD also promotes good aquaculture practices and effective management of aquatic resources to support rural development and alleviate poverty.

The Marine Fishery Resources Development and Management Department (MFRDMD)

Established in Malaysia in 1992, MFRDMD is mandated to conduct activities on marine fisheries resources. Focus activities of the Department are on biological studies of commercially important fish species, resource assessment and management, and conservation and management of aquatic species under international concerns, e.g. sharks and marine turtles. MFRDMD also implements activities that support Member Countries in information gathering of inland capture fisheries, and the use of indicators for sustainable development and management of fisheries.

SEAFDEC Council in the Year 2008

Chairman of the SEAFDEC Council: Dr. Martani Huseini

SEAFDEC Council and Alternate Council Directors:

Brunei Darussalam

Council Director: Dayang Hasnah binti Ibrahim
Director, Department of Fisheries

Alternate Council Director: Abd. Halidi bin Mohd. Salleh
Deputy Director, Department of Fisheries

Cambodia

Council Director: Mr. Nao Thuok
Director-General, Fisheries Administration

Alternate Council Director: Mr. Sam Nouv
Deputy Director-General, Fisheries Administration

Indonesia

Council Director: Dr. Made L. Nurdjana (Until January 2008)
Director-General of Aquaculture

Dr. Martani Huseini (Since January 2008)
Director-General of Fisheries Product Processing and Marketing

Alternate Council Director: Mr. Husni Mangga Barani (Until January 2008)
Director-General of Capture Fisheries

Dr. Made L. Nurdjana (Since January 2008)
Director-General of Aquaculture

Japan

Council Director: Mr. Akira Nakamae (Until November 2008)
Deputy Director-General, Fisheries Agency

Mr. Jun Yamashita (Since November 2008)
Deputy Director-General, Fisheries Agency

Alternate Council Director: Mr. Kozo Honsei
Director, First Country Assistance Planning Division, Economic Cooperation Bureau

Lao PDR

Council Director: Dr. Khamphay Thammavong (Until January 2008)
Deputy Director-General (Acting Director-General), Department of Livestock and Fisheries

Dr. Bounkhouang Khambounheuang (Since January 2008)
Director-General, Department of Livestock and Fisheries

Alternate Council Director Mr. Somphanh Chanphenxay
Deputy Director-General, Department of Livestock and Fisheries

Malaysia

Council Director: Dato' Junaidi bin Che Ayub
Director-General of Fisheries Malaysia

Alternate Council Director: Dato' Ahamad Sabki bin Mahmood
Deputy Director-General of Fisheries Malaysia

Myanmar

Council Director: Mr. Khin Maung Aye
Director-General, Department of Fisheries

Alternate Council Director: Mr. Khin Ko Lay
Deputy Director-General, Department of Fisheries

Philippines

Council Director: Atty. Malcolm I. Sarmiento, Jr.
Director, Bureau of Fisheries and Aquatic Resources

Alternate Council Director: Mr. Gil A. Adora
Assistant Director for Technical Services, Bureau of Fisheries and Aquatic Resources

Singapore

Council Director: Dr. Chua Sin Bin
Chief Executive Officer, Agri-food & Veterinary Authority

Alternate Council Director: Mr. Leslie Cheong
Director, Food Supply & Technology Department

Thailand

Council Director: Dr. Jaranthada Kannasuta (Until February 2008)
Director-General, Department of Fisheries

Dr. Somying Piumsombun (Since February 2008)
Director-General, Department of Fisheries

Alternate Council Director: Dr. Somying Piumsombun (Until February 2008)
Deputy Director-General, Department of Fisheries

Dr. Wimol Jantararothai (Since February 2008)
Deputy Director-General, Department of Fisheries

Vietnam

Council Director: H.E. Dr. Luong Le Phuong
Vice Minister, Ministry of Agriculture and Rural Development (MARD)

Alternate Council Director: Dr. Chu Tien Vinh
Director General, Department of Capture Fisheries and Resources Protection (DECAFIREP)

SEAFDEC Senior Officials in the Year 2008

Secretary-General

Dr. Siri Ekmaharaj

Deputy Secretary-General

Mr. Hideki Tsubata

Training Department (TD)

Chief

Dr. Siri Ekmaharaj

Deputy Chief

Mr. Hideki Tsubata

Marine Fisheries Research Department (MFRD)

Chief

Ms. Tan-Low Lai Kim

Aquaculture Department (AQD)

Chief

Dr. Joebert D. Toledo

Deputy Chief

Dr. Hiroshi Ogata

Marine Fishery Resources Development and Management Department (MFRDMD)

Chief

Ms. Mahyam Mohd. Isa

Deputy Chief

Dr. Osamu Abe

Message from the Chairman of SEAFDEC Council



SEAFDEC, during the year 2008, has been successfully implementing programs and activities which are aimed at addressing the priorities and concerns as expressed by the countries in the Southeast Asian region. These include the on-going efforts in promoting the adoption and the implementation of the Code of Conduct for Responsible Fisheries as well as the other activities implemented in line with the policy directives and priority actions guided by the SEAFDEC Council as well as other fisheries-related policy framework such as the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region which was adopted during the ASEAN-SEAFDEC Millennium Conference almost ten years ago in 2001. The SEAFDEC Member Countries recognized that the activities implemented by SEAFDEC have contributed to the development of fisheries sector in a more responsible and sustainable manner.

In addition to the above on-going initiatives and activities, the other prominent role of SEAFDEC during the recent years, of which I would also like to congratulate SEAFDEC as highlighted here, is the support it has provided that enabled the Member Countries to respond to the emerging fisheries-related international issues and requirements, and develop the regional harmonized approach on the issues in order to safeguard their welfare and benefits. This is considering the fact that during the recent years the Southeast Asian region has been confronted with several emerging issues that include climate change and the fluctuating price of fuel, which are envisaged to bring much impact to the sustainability of fisheries in the region. In order to respond to such situation and concerns, SEAFDEC has been implementing several programs that aimed to address the many constraints that confront our fisherfolk not only in terms of their technical requirements but also from the socio-economic point of view.

On behalf of the SEAFDEC Council, I would like to take this opportunity to express our appreciation to SEAFDEC for extending support to the Member Countries during the year 2008, and to the Government of Japan for its continued financial support through its Japanese Trust Fund as well as the ASEAN Foundation and the Swedish International Development Cooperation Agency (Sida). The continued support provided by these agencies has enabled SEAFDEC to carry out many projects and activities which are important for the sustainable development of fisheries in the Southeast Asian region.

As my term would end in early 2009, I would also wish to extend my gratitude to all Council Directors of the SEAFDEC Member Countries and to SEAFDEC Secretariat for the excellent support given to me as the Chairman of Council Directors. Lastly, I would also wish to express the hope that SEAFDEC would continue to provide assistance to the Member Countries and would continue to implement projects and activities that would ensure the sustainability of fisheries in the Southeast Asian region.



(Martani Huseini, Ph.D.)

SEAFDEC Council Director and Director General for
Fisheries Product Processing and Marketing
Ministry of Marine Affairs and Fisheries Indonesia

Message from the Secretary-General



In 2008, SEAFDEC with the support from the Member Countries has been implementing several programs and activities to ensure sustainable fisheries development in the region. On behalf of SEAFDEC and as the Secretary-General, I wish to express my utmost appreciation to all the Council Directors and the respective fisheries related agencies for providing guidance and support to SEAFDEC throughout the year.

For more than forty years, SEAFDEC has continued to provide assistance and support to Member Countries in conducting resources surveys and exploration of potential fishery resources of the region as well as in the development and introduction of fishing and aquaculture technologies to promote sustainable fisheries development of Southeast Asia. Moreover, considering the importance of fisheries sector in improving the livelihood and in contributing to the economic development of the region, SEAFDEC in 2008 continued to mobilize the regional expertise and extended HRD activities to the Member Countries, e.g. in the promotion of aquaculture in remote rural areas, introduction of “One Village, One Fisheries Product” or FOVOP”, etc. The application of quality assurance system applicable for fisheries SMEs of the region and examining the chemical contamination in aquaculture and other seafood products were also promoted to enhance the quality and safety of fish and fish products as well as their accessibility to the export market.

In addition to the development of fishing operations, aquaculture and the post-harvest technologies, SEAFDEC envisioned that appropriate fisheries management approaches are also very crucial to sustain the development of the fisheries sector. Therefore, SEAFDEC initiated a number of activities in the region to promote innovative fisheries management including rights-based fisheries and co-management, and exerted efforts to improve the fishery statistics and information system and the use of information to ensure better management of fisheries. In 2008, the Council also endorsed the establishment of the Regional Advisory Committee for Fisheries Management in Southeast Asia or RAC as a subsidiary body of the SEAFDEC Council. SEAFDEC convened the first RAC Meeting to discuss several fisheries management issues important for the region. I do hope that with the support from all Member Countries, RAC would be further mobilized to provide support and further enhance sustainable fisheries development in the region.

In 2008, SEAFDEC also boosted our efforts in improving our visibility through various information activities. The several materials developed and published would surely support sustainable development of fisheries in Southeast Asia. SEAFDEC has also implemented activities in collaboration with several international/regional organizations and partner agencies, among which I would like to mention here, include the ASEAN through the ASEAN-SEAFDEC Strategic Partnership (ASSP), the ASEAN Foundation, FAO, Sida, UNEP/GEF/SCS, etc. I would therefore wish to express my appreciation to all our collaborating partners for their support in the implementation of several activities during the past years, and also wish that such collaborative spirits would be continued and further strengthened to ensure the full benefits from sustainable fisheries development in the region.

(Mr. Siri Ekmaharaj, Ph.D.)
SEAFDEC Secretary-general

Overview of SEAFDEC in the Year 2008

During the year 2008, the activities of SEAFDEC were implemented in-line with the policy directives and priority actions identified by the SEAFDEC Member Countries during the SEAFDEC annual meetings, i.e. the 30th Meeting of SEAFDEC Program Committee (26-28 November 2007, Philippines), the 10th Meeting of the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) (29-30 November 2007, Philippines), and the 40th Meeting of SEAFDEC Council (7-10 April 2008, Indonesia). In addition, the important international/regional fisheries-related policy framework documents were also used as basis in the formulation of the SEAFDEC programs, i.e.:

- The Code of Conduct for Responsible Fisheries (CCRF) (1995)
- The Resolution on SEAFDEC Strategic Plan (1998)
- The Regional Guidelines for Responsible Fisheries in Southeast Asia:
 - Regional Guidelines for Responsible Fishing Operations (2000)
 - Regional Guidelines for Responsible Aquaculture (2001)
 - Regional Guidelines for Responsible Fisheries Management (2003)
 - Regional Guidelines for Responsible Post-harvest Practices and Trade (2005)
 - Supplementary Guidelines on Co-Management Using Group User Rights, Fishery Statistics, Indicators and Fisheries Refugia (2006)
- The Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region (2001)
- The Statement from the Seminar on ASEAN-Japan Cooperation for Sustainable Fisheries through SEAFDEC (2003)
- The ASEAN-SEAFDEC Plan of Action on Regional Cooperation for the Rehabilitation and Restoration of Fisheries in the ASEAN Tsunami Affected Areas (2004)
- The Information Strategies for Enhancing SEAFDEC Visibility and Communication (2006)
- The Coordinated Position for the Promotion of Small-Scale Fisheries in Southeast Asia (2007)

The programs implemented by SEAFDEC in the year 2008 are:

Departmental Programs

1. Center-wide Information Network (Secretariat)
2. Information and Communications Technology (TD)
3. Tailor Made Training and Study Tour (TD)
4. Integrated Mollusc Production (AQD)
5. Mud Crab and Shrimp Domestication (AQD)
6. Marine Fish (AQD)
7. Small-holder Freshwater Aquaculture (AQD)
8. Seaweed Strain Improvement (AQD)
9. Aquatic Ecology (AQD)
10. Other R&D Activities (AQD)

Programs under the Fisheries Consultative Group (FCG) Mechanism

1. Regionalization of the Code of Conduct for Responsible Fisheries (Secretariat)
2. Assistance for Capacity Building in the Region to Address International Trade Related Issues (Secretariat)
3. Strengthening Small-scale Fisheries Management through the Promotion of Rights-based Fisheries and Co-management (TD)

4. Improvement of Fishery Statistics and Information for Planning and Management of Fisheries in the ASEAN Region (Secretariat)
5. Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature) (TD)
6. Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses (TD)
7. Development of Technologies and Human Capacity Building for Sustainable Aquaculture (AQD)
8. Quality Assurance Systems for Small and Medium-sized Fish Processing Establishments in ASEAN Member Countries (MFRD)
9. Environmental Related Tasks in Southeast Asia (Secretariat)
10. Establishment of Disease Surveillance System of Aquatic Animals (AQD)
11. Chemical and Drug Residues in Fish and Fish Products in Southeast Asia (MFRD)
12. Research and Development (R&D) of Stock Enhancement of Species under International Concerns (AQD)
13. Research for Stock Enhancement of Sea Turtles (MFRDMD)
14. Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty (TD)
15. Support to Tsunami Rehabilitation of Affected Countries in the ASEAN Region (Secretariat)
16. Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2 (TD)
17. Deep Sea Fisheries Resources Exploration in Southeast Asia (TD)
18. Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea (MFRDMD)
19. Promotion of "One Village, One Fisheries Products (FOVOP)" System to Improve the Livelihood for the Fisheries Communities in ASEAN Region (Secretariat)
20. Development of Regional Database for Fishery Management (TD)
21. Information Collection of Highly Migratory Species in Southeast Asian Waters (TD)

Other Programs

1. Promotion of Set-Net: an Eco-friendly Fishing Gear of Sustainable Coastal Fisheries Management (TD)
2. Information Collection for Economically Important Species: as Surimi Raw Materials (TD)
3. Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program (TD)
4. Collection of Information about International Support in the Region (TD)
5. Promotion of Sustainable Freshwater Aquaculture for Rural Communities (Secretariat)
6. Promotion of Inland Small-scale Fisheries Management through Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Approaches (TD)

The programs implemented during the year 2008 have been endorsed by the 31st SEAFDEC Program Committee Meeting (3-5 November 2008, Singapore) and the 11th Meeting of the Fisheries Consultative Group of the ASEAN-SEAFDEC Strategic Partnership (FCG/ASSP) (6-7 November 2008, Singapore).

Summary of SEAFDEC Programs in the Year 2008

1. Responsible Fishing Technologies and Practices

In 2008, TD continued several projects/activities to promote responsible fishing technologies and practices in the region. The activities on the assessment of the Juveniles and Trash Excluder Devices (JTEDs) and the research on impact of fishing on the environment and ecosystem were carried out. JTEDs assessment was conducted by using questionnaire in Indonesia (7-11 October 2008) and in Malaysia (18-23 November 2008); while monitoring surveys on the use of JTED were conducted in Thailand (8-9 December 2008) and Myanmar (15-19 December 2008). For the research on impact of fishing on the environment and ecosystem, research survey on the impact of crab trap was carried out by using questionnaires survey in the eastern part of Thailand; and research and data collection on the impact of light fishing was carried out in the Philippines and Thailand.

In addition to the above activities, TD also developed alternative energy saving technologies, i.e. sail boats for fishing operations. Activities were also carried out to introduce appropriate onboard fish handling and preservation techniques in order to maximize the use of catch and reduce post-harvest losses; and from 1-5 December 2008 an on-site training on fish handling at sea was organized in the Philippines.

To promote TD initiative on responsible fisheries to target groups as well as to the public, video titles on the Reduction of Environmental Impact from Tropical Shrimp Trawling in Southeast Asia and the Study of Luring Light Effects on the Squid Behavior, together with relevant promotional materials and information packages, were developed. A series of monographs of fishing gear and methods used in the Member Countries have also been compiled and published by TD. In 2008, a monograph of fishing gears in Myanmar was finalized; while the fishing gear survey and data collection were conducted in Indonesia (Bali and Jakarta) and the fishing gear monograph was published at the end of the year.

During the year, TD with support from the ASEAN Foundation also organized the Regional Training Course on Responsible Fishing Technology from 18 to 27 November 2008. The course which was aimed at providing HRD activities to relevant fisheries officers in the Member Countries, focused on responsible fishing and practices, fabrication of appropriate



Participants in the Regional Training Course on Responsible Fishing Technology preparing JTED for experimentation in the sea

fishing gears, improving fish catch quality by using small-scale insulated fish box, safety at sea, and introduction of sail boat for fishing operations. Also covered by the course were the new approaches to responsible fisheries extension, its concept and methodologies as well as the appropriate technologies and manners to conduct on-site HRD activities in selected countries.



The survey on impact of light fishing in eastern part of Thailand

2. Exploration and Monitoring of Fishery Resources and Utilization

2.1 Exploration and fishery resources survey in the Southeast Asian waters

From 4 June to 5 July 2008, TD conducted deep-sea resource surveys in the waters of Brunei Darussalam using the M.V. SEAFDEC 2; and on 8 October 2008, the fishing trial on deep-sea trap and bottom vertical longline was also conducted in Thailand using the M.V. Plalung.

From 26 May to 15 June 2008, TD in collaboration with UNEP/GEF/SCS project conducted the “Advanced Regional Training Workshop on Larval Fish Identification and Fish Early Life History Science” which is envisaged to enhance the capacity of countries in the region in conducting fishery resources survey. The workshop developed the monograph on “Early Stages of Marine Fishes in Southeast Asian Region” as one of its important achievements. In addition the Fish Larvae Network of the Southeast Asian Region was also established and a dedicated e-mail “larvae_network@seafdec.org” was created to enhance communication and sharing of information and knowledge on fish larvae among the network members.

In the Southeast Asian region, most of the fishing operations are carried out in the coastal and shallow off shore waters, resulting in the heavy exploitation of fishery resources in the area. TD is therefore undertaking activities to explore the potential fishery resources in the un-trawlable areas, sea mounts and deep sea basins of the region. In addition, the appropriate fishing technologies to harvest the resources in these deep sea areas were also examined. During 2008, TD held consultation meetings with the Philippines on 5-8 March and with Brunei Darussalam on 1-4 April, to discuss the collection of information on deep-sea ecosystem and the impact from fishing activities. Research surveys were subsequently

conducted using the deep sea trawl and traps in three identified areas, i.e. the Andaman Sea (27-29 March), the Brunei Darussalam Waters (4 June to 5 July), and the Lingayan Gulf of the Philippines (11-25 May). In addition, the Training/Workshop on Deep-sea Fishery Resources on the Continental Shelf/Slope in Southeast Asia was also organized in the Philippines, in collaboration with the Bureau of Fisheries and Aquatic Resources (BFAR).



To publicize the outcomes from the resources exploration survey, TD produced and disseminated the report on the economically important species in the un-trawlable grounds and a guidebook for bottom vertical longline including the potential resources of economic species in the un-trawlable grounds in Andaman Sea; CD-ROMs containing information on potential resources of some economically important species on the un-trawlable grounds in the waters of Myanmar; as well as the outcomes from deep-sea resources survey using bottom trawl carried out onboard the M.V. DA/BFAR. From 17 to 19 June 2008, TD also collaborated with FAO in organizing the Workshop on Assessment and Management of Offshore Resources of South and Southeast Asia. In addition, to further enhance the skills and experiences of TD staff in undertaking deep sea resources survey, a project staff took part in the deep sea research program under the Seikai National Fisheries Research Institute, Japan, from 20 July to 19 August 2008.



Researchers separating samples from the deep sea survey (above); and participants in the Advanced Regional Training Workshop on Larval Fish Identification and Fish Early Life History Science identifying the fish larvae samples (below)

2.2 Information collection of highly migratory species

Tuna is one of the highly migratory economic fish species of the world, including the Southeast Asian region. The production of tuna in the region is for both domestic consumption and export to other countries, e.g. Japan and EC countries. However, knowledge on the tuna resources and stocks in the region is still insufficient to support appropriate tuna resource management at the national level. TD therefore started the implementation of activities to develop the framework for collection of relevant data/information available in the SEAFDEC Member Countries, starting from the Philippines, Vietnam, Indonesia, and Thailand.

During the year 2008, the tuna production statistics (bigeye, yellow fin, albacore tunas and neritic tunas) based on landing sites in the concerned countries were reviewed in order to preliminarily evaluate the existing information. A national focal point was nominated from

each country as member of the working party to be involved in the project planning and consultation. Consultation visit was made to observe the tuna landing sites in General Santos, Davao of the Philippines and in Banda Aceh, West Sumatera of Indonesia. Two working party meetings on Information Collection of Tuna in the Southeast Asian Waters were also organized: one for Vietnam and Indonesia (8-9 October 2008 in Bangkok, Thailand), another one for the Philippines and Thailand (November). Based on the suggestion/agreement made during the working party meetings, tuna information/data collection would be further collected.



TD in collaboration with the Philippines' BFAR organized the Training/Workshop on Deep-sea Fishery Resources in the Continental Shelf/Slope in Southeast Asia and practical fishing survey onboard the M.V. DA/BFAR

2.3 Information collection for economically important species: as surimi raw materials

Surimi is one of the important fish products in the region. Based on the surveys undertaken by TD in 2006, there are a total of 80 Surimi manufacturing plants in the Southeast Asian region, of which 26 are in Thailand, 15 in Vietnam, 3 in Myanmar, 8 in Indonesia and 15 in Malaysia. However, the depletion of fisheries resources, particularly the demersal resources in many countries in the region resulted in direct impacts to the surimi industry of the region. The status of the surimi industry, particularly the availability of raw materials supply, is one of the important areas of concern; therefore, information should be collected on the economically important species which has potentials to be used as surimi raw materials.

In November 2008, the project team from TD visited Vietnam and Myanmar to discuss the status and trend of surimi raw materials species. In addition, in December 2008, a review of larval fish abundance of surimi raw materials in South China Sea was also conducted. Three poster titles: Surimi raw materials in the Southeast Asian countries, Surimi industry in the Southeast Asian countries, and Status of fishing grounds for surimi raw materials, as well as the document on "Status and potential fisheries resources of some economically important species as surimi raw materials" were produced and disseminated to relevant countries.

2.4 Tagging program for important pelagic species

Considering that pelagic fish migrates to the optimum environmental conditions, investigation on migration patterns of small pelagic fishes is an urgent subject for the identification of stocks and clarification of shared stocks for important pelagic species. Tagging activity is one of the methods used to study the migration route of small pelagic fishes. Thus MFRDMD since 2007 has undertaken the "Tagging program for economically important pelagic species in the South China Sea and Andaman Sea" in collaboration with TD and eight participating countries, namely Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Vietnam. The species being tagged were *Rastrelliger kanagurta*, *R. brachysoma*, *Decapterus macarrellus*, *D. macrosoma*, and *D. maruadsi*, most of which were obtained from purse seine catch.

In the Andaman Sea, tagging operations were conducted in Indonesia, West Coast of Peninsular Malaysia, Myanmar, and Thailand, where a total of 2,531 fish were tagged in 2008. For the South China Sea, tagging operations were conducted in Brunei Darussalam, Cambodia, Malaysia (East Coast of Peninsular Malaysia, Sarawak and Sabah), the Philippines, Thailand, and Vietnam, where a total of 8,358 fish were tagged. In general, all the countries faced difficulty in obtaining sufficient samples for tagging as most of the time the sea was rather rough due to the strong wind/cyclone (including the Cyclone Nargis in early May 2008).



Technical assistance to Banda Aceh for tagging activities in 2008

Information on the number of fish tagged and recaptured was handled by the participating SEAFDEC Member Countries, with the data verified by the project technical officers before inputting these into the database developed by TD. Currently, recovery was about 90 fish (from Malaysia, Vietnam and Myanmar) in the same area of the tagging site within one week from release.

From 13-14 October 2008, the 2nd Core Expert Meeting was held in Kuala Lumpur, Malaysia to discuss the progress of the project implementation in 2008 and formulated the draft research plan for tagging in the South China Sea and Andaman Sea for 2009 and onwards. The standard data processing procedure was also discussed and finalized by the representatives from all the participating SEAFDEC Member Countries.

Also under this program, MFRDMD continued to compile the supplementary information on the present status of Fish Aggregating Devices (FADs) operation (type, location, distribution, owner and number) and Sardine catch (gear, boat, method of operation and fishing season) in the South China Sea, using the standard data collection format provided by MFRDMD to all participating countries. It is envisaged that the outcomes from the activity could be very useful for the management of purse seine fishery in the region.

3. Management for Sustainable Fisheries

3.1 Promotion of innovative fisheries management

TD implemented activities to promote rights-based fisheries and co-management through institutional building and participatory mechanism as an innovative coastal fisheries management. The First inception meeting on small-scale fisheries management in the Southeast Asian Region was organized from 29 April to 1 May 2008; and the regional training course on coastal fisheries management from 27 October to 7 November 2008. In addition, TD also promoted the participatory mechanism on the use of indicators for coastal fisheries co-management. The regional workshop on the implication of indicators for coastal fisheries management in the ASEAN region was organized from 22 to 24 July 2008; and the

institutional design on co-management using indicators for coastal fisheries management was developed. As a follow-up, the national workshop on guidelines and standard methods of data collection and indicators for large-scale and small-scale fisheries in Thailand was organized on 5-7 and 13-15 August 2008, respectively.

In improving the capacity of fisheries community for fisheries management and alleviation of poverty, the project on integrated coastal resources management was continued from last year in Thailand, Malaysia and Cambodia. In Cambodia, the activities focused on human and institutional capacity building through its community fisheries in the project operational area and encouraging stakeholders' participation in the implementation of the project activities. Since the main project activities in Thailand and Malaysia have already been completed, activities were therefore aimed at monitoring and providing technical supports to the activities that has already been transferred to local organizations of the respective countries, i.e. for Thailand, the Department of Fisheries (DOF) and the Fishermen's Group; and for Malaysia, the Fishery Resources Management Community. From 21-23 October 2008, TD also organized a regional seminar to review the impacts from the project implemented in Malaysia to relevant fishing communities, in order to share the approach and experiences from the project implementation with the other countries in the region. Also aiming to transfer the knowledge and experiences on coastal fisheries management to countries in the region, TD conducted the International Training Course on Coastal Fisheries Management for Fishery Managers from 6 to 15 May 2008 and the International Training Course on Coastal Fisheries Management and Extension Methodology from 2 to 29 September 2008.

In addition to the institutional capacity building to support coastal fisheries management, TD also promoted the use of Set-Net as an eco-friendly fishing gear for sustainable fisheries management. The experiment and promotion of Set-Net was first implemented in Thailand starting in 2003, and the activities have recently been expanded to Indonesia. For Thailand, the improvement of Set-Net and follow-up surveys were conducted in Ban Phe (Rayong Province) and Sriracha (Chonburi Province).



Participants of the Regional Training Course on Coastal Fisheries Management visit a small scale fishing village (above); and Fishermen collecting the catch from Set Net (below)

In Sriracha, the shallow water type of Set-Net, “Choko-ami” was also introduced and experimented in the coastal green mussel farm. The installation has been completed in September 2008, and the data collection was carried out until December 2008. For Indonesia, a Technical Advisory Trip by TD staff was arranged in Indonesia at the end of February to assist the Bone Set-Net project, in South Sulawesi, Indonesia. Gear installation was completed in early March 2008, after which fishing operation has been started under the community management and data collection has also been conducted.

Based on the five year experiences from the Set-Net project, TD in April 2008 published the Set-Net Project technical manual which was distributed to the Member Countries. TD also conducted an evaluation of the Set-Net activities, in terms of gear improvement (better catch and income), and fishers’ group management enhancement.

3.2 Habitat conservation and resources enhancement

In supporting habitat and fisheries management in the Southeast Asian region, SEAFDEC in consultation with regional partners, e.g. the UNEP/GEF/SCS Project and countries in the region developed the criteria to determine the size of national, sub-regional and trans-boundary areas of significance. However, in 2007 during the “On-site training/workshop on the Integration of Fisheries Management into Habitat Management” in Cambodia, the concept on larger management areas and boundaries was discussed; and it was agreed that sets of maps should be developed in order to have a summarized view on the location and size of the different management areas, starting with Cambodia and Thailand

In 2008, a follow up activity was conducted with working groups of the UNEP/GEF/SCS project in the development of plans for the establishment of fisheries refugia in the Gulf of Thailand and the South China Sea.

Relevant information on the status of important nursery grounds, spawning areas and coastal habitats in the Gulf of Thailand and South China Sea are now available through the working groups. In addition to the establishment of fisheries refugia, SEAFDEC also promoted the concept of “Integration of Fisheries Management into Habitat Management” in the international fora, such as the AEHMS Conference on Ecosystems Approach to Fisheries in Hanoi, 18 – 20 February 2008.



The project staff of ICRM-SV followed up and monitored the activities in the project site

3.3 Combating IUU fishing (Promotion of fisheries licensing and registration system)

Since 1998, SEAFDEC has been supporting the implementation of the Code of Conduct for Responsible Fisheries in the region, including the International Plan of Action to combat IUU Fishing. However, through several discussions among the countries in the region, it was generally perceived that there are no reliable or aggregated information on the size and structure of large-scale fisheries in the Southeast Asian region to be used as basis for fisheries management.

In 2007, the activities in combating IUU Fishing in the region has also been intensified with the endorsement of the “Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating Illegal, Unreported and Unregulated (IUU) Fishing in the Region ” by Ministers responsible for fisheries from Australia, Brunei Darussalam, Indonesia, Malaysia, Papua New Guinea, the Philippines, Singapore, Thailand, East Timor and Vietnam; and the involvement of SEAFDEC in the RPOA activities mainly through the Coordinating Committee. SEAFDEC has also been involved in the review on MCS practices in the region, which need more intensified efforts for improvement because of unclear institutional responsibilities. A recommendation was therefore put forward for the institutional responsibilities among Member Countries for the different elements of the M-C-S process to be strengthened. As for the Gulf of Thailand, which was identified as one of the sub-regions, SEAFDEC supported the conduct of the first Gulf of Thailand Workshop in March 2008, and it is expected that the second Gulf of Thailand Meeting would be organized in early 2009.

SEAFDEC also hosted the “Expert Meeting on Fishing Vessel Registration” from 30 June-2 July 2008, in Phuket, Thailand, where relevant information regarding the systems, routines and status of fishing vessel registration development from each country were revealed. It was noted that, although ideally, the functions of vessel registration (safety at sea, etc) and licensing for fishing should be handled by the same institution, there are still some legal difficulties for some countries to move towards this direction. In addition, while taking note on the diversity and limitations of the countries in the region, it was discussed and recommended that fishing vessel registration could be an area for regional cooperation in the future.

3.4 Fishery statistics and information

SEAFDEC has been supporting the Member Countries in enhancing the use of fishery statistics and other relevant information for policy planning and management of fisheries. Activities undertaken during the past few years include the strengthening of national fishery statistical system and mechanism, and development and harmonization of the regional standards, classifications, and definitions of fishery statistics with the international level.

In 2008, the “Framework for Fishery Statistics of Southeast Asia”, which is considered as the minimum requirement for fishery statistics that should be achieved at national level has been finalized. The framework will be also used as a framework for SEAFDEC to continue the compilation of fishery statistics in the region (with a change in scope from the South China Sea to the Southeast Asian region).

To discuss and conclude the harmonized questionnaires and streamlined reporting of fishery statistics from Member Countries to FAO and SEAFDEC, the Regional Workshop on Streamlined Reporting of Fishery Statistics in Southeast Asia was organized in Bangkok, Thailand in July 2008, which will be implemented in collaboration with FAO starting in 2009 with the statistics of 2008.

In addition, SEAFDEC also developing regional databases on fishery Statistics that will be access through website, which contain fishery statistics of the region based on statistics of Member Countries. This is envisaged to support the Member Countries in obtaining and accessing statistics and information required to support management of fisheries in user friendly form.

In addition, SEAFDEC also supports the Member Countries in development of the Status and Trends for Capture Fisheries and Aquaculture, based on available data and information. In 2008, the pilot countries involved in the activities include the Philippines, Thailand and Indonesia.



The Regional Workshop on Streamlined Reporting of Fishery Statistics in Southeast Asia: participants (above) and the hands-on practical session (below)

4. Conservation and Management of Aquatic Species under International Concerns

4.1 Sea turtles

For the conservation and management of sea turtles, MFRDMD since 2004 carried out the research on stock enhancement of sea turtles, comprising the studies on sea turtle tagging and satellite telemetry, sea turtle stock identification, and detection on multiple male paternities. From 15 to 17 October 2008, MFRDMD organized the Third Regional Technical Consultation Meeting to discuss the outcomes of the activities on sea turtles implemented from 2004 to 2008 and plan the activities to be implemented in 2009 and onwards.

The sea turtle tagging and satellite telemetry study aims to determine the migration routes, the inter-nesting and foraging habitats, as well as other relevant biological information of sea turtles in the region. Conventional Inconel Tags and Passive Integrated Transponder (PIT) Tags (or microchip tags) have been used in conducting the sea turtle tagging surveys. Inconel Tags had been continually used in Brunei Darussalam, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Vietnam; while PIT Tags had also been used as supplement tags in Malaysia, Thailand, Indonesia, Myanmar and the Philippines. In addition to tagging, satellite telemetry study had also been conducted from 2005 to 2008.

MFRDMD also conducted the regional analysis on stock identification of green and hawksbill turtles in the region with the objectives of detecting the subpopulations of nesting green and hawksbill turtles in the region, and to identify the genetic markers of different management units. For green turtles, the tissue samples were gathered from 14 sites

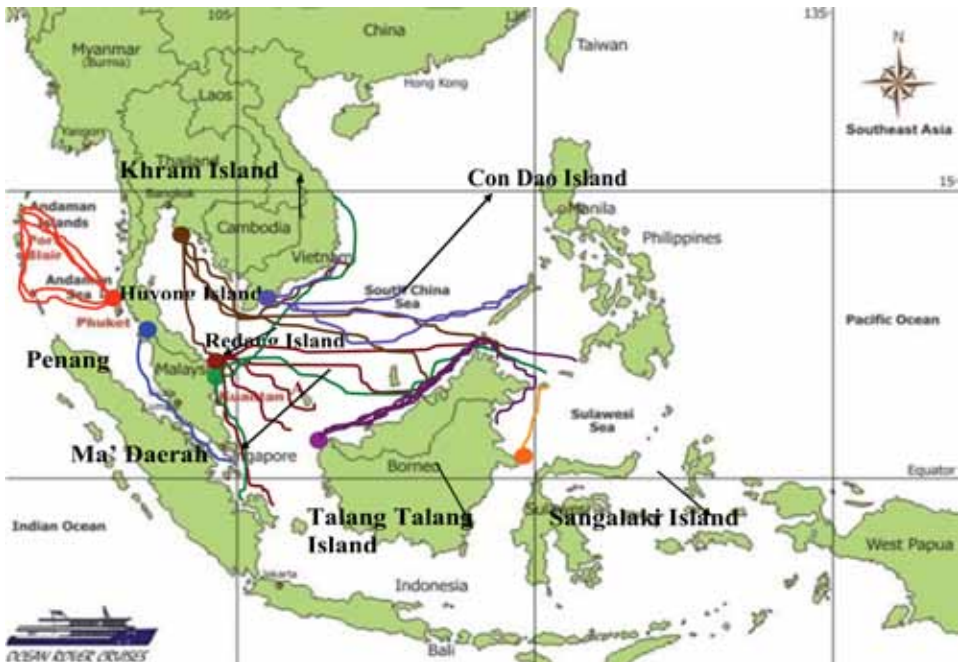


throughout the region. For hawksbill turtles, 136 samples were collected from 9 sites (nesting beaches). The results suggest that the green turtles in the region could be grouped into 12 management units (subpopulations). However, no conclusive result could be made on the hawksbill turtle population due to the small sample size collected.



In addition, the study on Detection of Multiple Paternities of Male Green Turtles was also conducted at Mak Kepit Beach, Terengganu. The objectives are to determine the level of multiple paternities and to estimate adult male stock sizes at nesting beaches. A total of 300 tissue samples of hatchlings of the green turtle from 10 nesters in Mak Kepit beach, Redang Island of Terengganu, Malaysia had been analyzed through DNA microsatellite marker to determine whether all the hatchlings in a nest have the same father or different fathers.

Turtle tagged with the PIT before releasing back to the sea (above); and the Third Regional Technical Consultation Meeting on Sea Turtles (below)



Migration Routes of Green Turtles (Chelonia mydas) obtained through the Satellite Telemetry Studies

In addition to the activities on research on stock enhancement of sea turtles, TD also carried out an investigation on interaction between fisheries activities and sea turtles mortality, as well as the effectiveness of the use of the Turtle Excluder Devices (TEDs) and Circle Hooks in reducing sea turtle mortality. Information on sea turtle mortality in the region was collected in collaboration with the SEAFDEC Member Countries and through the Indian Ocean-Southeast Asian (IOSEA) Marine Turtle MOU.

4.2 Sharks

Countries in the Southeast Asian region have recognized the importance and the need for conservation and management of sharks. In 2002, SEAFDEC started carrying out activities on conservation and management of sharks; and in 2003 and 2004, the regional study on Shark Production, Utilization and Management in the ASEAN Region was conducted. SEAFDEC has also supported Member Countries in the establishment of the National Plan of Action (NPOA-sharks) on the Conservation and Management of Sharks. Up to 2008; Malaysia, Indonesia and Thailand have established their NPOA-sharks; Brunei Darussalam, Myanmar, and the Philippines have finished the draft NPOA; while Vietnam and Cambodia were still under the development process. In 2008, SEAFDEC continued to keep track of the progress made by Member Countries in the development and implementation of the NPOA-sharks; and also monitored the issue at the international level especially the proposed listing of shark species under CITES, in order to inform the Member Countries as appropriate.

4.3 Sea cucumbers

Sea cucumber species, especially those in the family Holothuriidae and Stichopodidae, have been taken into account as a critical issue, particularly at the various Sessions of the Convention on International Trade in Endanger Species (CITES), where concern was expressed that the commercial sea cucumbers species should be included into CITES Appendices. However, as the listing of sea cucumbers in the CITES Appendices may give negative impacts on sea cucumber fisheries in the Southeast Asian region, SEAFDEC in 2007, collaborated with countries, namely Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Vietnam and Thailand to conduct a regional study on sea cucumber fisheries, trade and utilization in Southeast Asia. The 'Ad-hoc Regional Working Group on Sea Cucumber



Sea cucumber (above); and Regional Expert Meeting on Sea Cucumbers (below)

Fisheries' was also established to support the planning and conduct of such study. From 18 to 20 March 2008, the Regional Expert Meeting on Sea Cucumbers was organized in Thailand to discuss the outcomes from the regional study and investigate the possibility for the development of action plan and/or policy consideration on sea cucumbers. The Report of the regional study is being compiled and is expected to be published in early 2009.

4.4 Whale

Recently, large cetaceans such as whales are often observed in the coastal habitats in the Southeast Asian waters; and questions have been raised on the reasons why these large cetaceans are migrating towards the coastal areas. TD therefore in 2008 started the implementation of an activity to gather data and information on species composition of cetaceans such as whales, dolphins and porpoise in the Southeast Asian waters, and investigate the interaction between the existing cetaceans and the small pelagic resources. Consultation visit to the Institute of Cetacean Research (ICR) and Tokyo University of Marine Science and Technology (TUMSAT) in Japan was made in order to discuss and seek their technical support for the future activities.



The cetacean sighting survey was made onboard the M.V. SEAFDEC 2

In 2008, sighting survey was included during the three research cruises of the M.V. SEAFDEC 2. In addition, to build the capacity of researchers in undertaking such activities, TD organized a training workshop on Cetacean Research and Sighting Survey from 21 to 30 November 2008. The knowledge and experiences gained from the workshop is expected to be further transferred to the Member Countries to support the future program implementation.

4.5 R&D on stock enhancement for species under international concerns

The Program on Research and Development on Stock Enhancement for Species under International Concerns was continued by AQD to develop methodologies for seed production and strategy for release, monitoring and impact assessment, including the socio-economic aspect, for stock enhancement of threatened species such as the seahorse, giant clam, sea cucumber and abalone.

Concerning the sea horse, a threatened species listed under the CITES, AQD succeeded in increasing the production of hatchery-bred seahorse (*Hippocampus barbouri*, *H. comes*, *H. kuda*) juveniles by improving water management and feeding schemes. However, the survival of juveniles less than 30-day old was still inconsistent.



Seahorse (Hippocampus comes) (left); and seahorse hatchery facility at SEAFDEC/AQD's Tigbauan Main Station (right)

With regards to the activities on abalone (*Haliotis asinina*) stock enhancement, in response to the extremely low recapture of released juveniles in 2007, tagged/hatchery-bred juveniles were released to cages in Carbin Reef, Sagay Marine Reserve in Central Philippines to observe their behaviors and survival after release. The released juveniles tended to hide in crevices or seek shelter. High numbers of abalones (40%) were consistently found among corals during the period. Under cage condition, the survival on 180 days after release was 28%. These results will be useful for designing release strategy. Tagged abalone juveniles were also preliminarily released to wild condition in Carbin Reef to compare their growth and survival with those of the juveniles released in the cages.



Diet-tagged abalone (Haliotis asinina) (left); and diet-tagged abalone (H. asinina) for release in Carbin Reef, Sagay Marine Reserve (right)



Sampling for abalone in Sagay Marine Reserve

5. Post-harvest Technology and Safety of Fish and Fish Products

5.1 Quality assurance systems for Small and Medium-sized Fish Processing Establishments in ASEAN Member Countries

In Southeast Asia, traditional fish products represent a significantly large part of total fish utilization and are a major source of animal protein. These products are therefore vitally important to food security, particularly for the marginalized and poorer segments of the population. However, many small and medium-sized fish processing establishments in ASEAN Member Countries have difficulty in implementing quality assurance systems due to economic and technical constraints. The program was therefore implemented by the MFRD with the objective of developing quality assurance systems for traditional fish products processing establishments (TPEs) and pre-processing establishments (PPEs), for these establishments to be able to meet quality assurance of fish products which constitute a major source of animal protein in the Southeast Asian region.

The program aims to develop quality assurance systems for these SMEs that incorporate Good Manufacturing Practice (GMP) and Standard Sanitation Operating Procedures (SSOP) as a first step towards the implementation of HACCP and help them meet safety and quality assurance requirements. Manuals on GMP/SSOP guidelines will also be prepared and distributed to member countries to assist them to conduct national training programs. The program is also in line with Measure No 46 of the Roadmap for the Integration of the Fisheries Sector under the ASEAN Framework Agreement for the Integration of Priority Sectors.

In 2008, MFRD continued to compile the various GMP developed by each country for selected PPEs: crab meat (pickling) for Cambodia, fish meat/fillet (for surimi) for Indonesia, shrimp pre-processing (de-heading/peeling and or de-veining) & fish meat/fillet (for surimi/otoshimi) for Malaysia, (Shrimp pre-processing (de-heading/peeling and or de-veining) for Myanmar, shrimp salting (for shrimp paste) and crab meat (pickling) for the Philippines, shrimp pre-processing (de-heading/peeling and or de-veining) for Thailand, and shrimp pre-processing (de-heading/peeling and or de-veining) for Vietnam.

From 2 to 4 September 2008, MFRD also organized the End-of-Activity (EOA) Workshop on GMP for PPEs in the Philippines with participants from all ASEAN Member Countries. Presentations were made on the GMP developed by the seven ASEAN Member Countries for their selected PPEs; and study visits were made to two PPEs for shrimps in Manila. The handbook, "GMP for Small and Medium-Sized Pre-Processing Establishments in ASEAN" was published by MFRD and distributed to all ASEAN Member Countries during the Workshop.

For the TPEs, the ASEAN Member Countries (except Cambodia) in 2008 started their national projects to develop GMP for their selected TPEs: fermented shrimp paste (belacan) for Brunei Darussalam, Salted boiled fish (pindang) for Indonesia, fermented fish (prahok) and dried fish for Lao PDR, fish cracker (keropok lekor) & dried anchovies for Malaysia, fermented (pickled) fish and fish sauce for Myanmar, smoked milkfish & shrimp sauce for the Philippines, fish balls and fish cakes for Singapore, fish sauce & dried shrimp for Thailand, and fish sauce and fermented tiny shrimp paste for Vietnam. The handbook on GMP for selected TPE would be developed by MFRD based on these projects.

5.2 Chemical and drug residues in fish and fish products in Southeast Asia

The presence of chemical contaminants and drug residues in fish and fish products has serious implications to trade and on human health. As such, there is a need for the region to gain an understanding of current levels of such chemical and drug residues in fish and fish products in order to take appropriate action to manage the safety of fish and fish products. The program on “Chemical and Drug Residues in Fish and Fish Products in Southeast Asia” was therefore implemented by MFRD from 2004 to 2008 with the objectives to: 1) obtain an understanding of the levels of chemical contaminants in fish and fish products in Southeast Asia, and 2) transfer technology in chemical contaminant testing in the region through setting up of methodologies and human resource training.

In 2008, MFRD conducted four regional surveys on: 1) heavy metals (in Cambodia, Indonesia, Malaysia, Myanmar, Singapore, Thailand and Vietnam); 2) pesticide residues (in Cambodia, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam); 3) histamine (in Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam); and 4) drug residues (in Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam). A total of 186 species and/or products were studied with a total of 4,902 samples collected for analysis from 2004 to 2008 and the majority of the results were within regulatory limits.

From 22 to 24 October 2008, MFRD also conducted the “End-of-Project Meeting” for all Key Project Leaders (KPLs) to summarize the activities implemented under this program since 2004, i.e. the nine training courses

participated in by 106 fisheries officers from key laboratories of 9 ASEAN Countries, the surveys on heavy metals, pesticide residues, histamine and drug residues conducted from 2004-2008; identify the challenges faced in the implementation of the program; and deliberate the program/activities to be implemented in the future. In this regard, the program on “Biotoxins Monitoring in Fish and Fish Products in Southeast Asia” was proposed to be implemented from 2009 to 2012”.



The End-of-Project Meeting for the program on “Chemical and Drug Residues in Fish and Fish Products in Southeast Asia”

5.3 Other

During the year, MFRD shared the information and expertise in the area of post-harvest technology and food safety for fish and fisheries products at various events organized at national, regional and international levels.

The first event was the ASEAN Training Course on Post-Harvest Technologies on Aquaculture Fishery (16-27 June 2008 in Vietnam), where two Senior Research Officers from MFRD served as resource persons and presented lectures on ‘Fisheries Production and Consumption’ and ‘Situation of the Application of Post-Harvest Technologies in ASEAN’ and on ‘Seafood Safety and the Strategy for Seafood Safety Assurance in ASEAN’. In addition, a country report on the situation of fisheries post-harvest technology in Singapore was also presented by MFRD.

The second event was the Jiangnan University-Nanyang Polytechnic Joint Scientific Conference “Current Trends in Food Science, Food Safety & Product Development, (23-24 September 2008 in Singapore), where MFRD made presentation on “Surimi Seafood: Manufacturing, Market & Products” covered the amount of surimi traded in the world and showcased the various types of surimi-based products from Japan, Korea, USA and South-East Asia.

Lastly, during the Fifth World Fisheries Congress 2008 (20-24 October 2008 in Yokohama, Japan), MFRD presented a paper on “Maximizing Utilization of Fish Catch for Human Consumption” based on the Department’s work on the utilization of under-utilized marine and freshwater fish such as, selar scad, Indian mackerel and soldier river barb. The Congress also enabled MFRD to share its R&D efforts on the utilization of marine and freshwater fish with researchers from other countries.

6. Sustainable Aquaculture Development

6.1 Integrated mollusk production

Experiments were continued on the donkey’s ear abalone, *Haliotis asinina* that focused on refining the management and spawning techniques for captive broodstock; improving the seed production technology through environmental manipulations and enhancement of growth of natural food; assessing the nutritional requirements of juveniles; and developing viable technology packages for the intermediate nursery culture and marketable production.

Results showed that artificial lighting was not critical during the settlement period of rearing abalone. However, this was found significant in the latter part of rearing because it enhanced diatom propagation and the number of juveniles harvested. The effects of water management techniques and substrates during abalone hatchery operations were assessed. The settlement and survival rates of abalone reared in the UV-treated seawater and sand-filtered seawater were not significantly different during the first 10 days of postlarval rearing. However, the settlement and survival rates of abalone during the first 10 days of rearing in flow-through system were significantly lower than those held in stagnant water system.



Abalone (H. asinina) juveniles produced in AQD’s small-scale abalone hatchery (above); and His Excellency, Makoto Katsura, Ambassador Extraordinary and Plenipotentiary of Japan to the Philippines (center) visited AQD’s abalone hatchery. With him in photo are AQD Chief, Dr. JD Toledo and Deputy Chief, Dr. H. Ogata (below)

Simulated transport experiments on different stages of abalone showed that loading density of 50 thousand larvae/liter during trocophore larval transport and transport duration within 6 hours in oxygenated plastic bags at 20-22°C had better survival than those loaded at either 25 thousand or 100 thousand larvae/liter or when transported at higher temperatures (24-25°C). PVC pipes were also found more practical to use during transport of juveniles and adults than the plastic trays due to higher loading density.

Progress was also made in assessing the nutritional requirements of abalone juveniles. Dietary treatments containing high lipid content (8.92% and 11.54%) resulted in significantly better weight gains of juveniles than those given the lipid-free or low-lipid diets.

Hybridization trials aimed at developing tropical abalone hybrids that may be fast growing and have better meat quality were continued. Growth of juvenile hybrids (*H. asinina* female x *H. glabra* male) and pure species, *H. asinina* in tanks was compared and it was found that the former grew better than the latter. Techniques for nursery rearing of abalone both in land-based tanks and in floating net cages were also refined.

6.2 Mud crab and shrimp domestication

This program aims to develop viable technology for the production of good quality seed and captive broodstock of native species, particularly, *Penaeus monodon*, *P. indicus* and *P. merguensis* for shrimps and crabs *Scylla serrata*. With regard to shrimps, the program continued to monitor the status of *P. monodon* captive broodstock development and the possible impact of the introduction of *P. vannamei* in the Southeast Asian region. Malaysia, Thailand, Philippines and Vietnam have gone into the domestication of *P. monodon* but commercial scale breeding has been more challenging than the development of genetically improved and specific pathogen-free (SPF) *P. vannamei* broodstock. In the Philippines proactive monitoring of the presence of shrimp diseases in hatcheries and grow-out farms has been established.

Studies were continued to develop the technology to produce viable *P. monodon* and *P. indicus*/*P. merguensis* broodstock in captivity. In the Philippines, *P. monodon* broodstocks from the wild were examined to assess their genetic variation. Negros and Roxas (central Philippines) stocks had moderately high genetic variability levels with haplotype diversities at 0.820 and 0.775, respectively compared to the Bohol (also in central Philippines) stock.



Captive *Penaeus indicus* subadults (left); and Captive *P. monodon* broodstock with maturing ovary (right)

AQD formulated diets were developed and tested for their effectiveness to improve the maturation success of pond-reared broodstocks and growth of shrimp at various stages. Some aspects of the biology of the seaworm, *Perinereis nuntia*, were also investigated, including evaluation of its potential as substitute for fish meal, shrimp meal and squid meal in shrimp feeds. Based on dry matter, the seaworms contained 48% crude protein, 16% crude fat and 11% HUFA.

For mud crab, the activities focused on domestication, refinement of broodstock management and seed production techniques, and improvement of culture techniques during nursery and grow-out phases and in different production systems. Wild stocks collected from various sites in the Philippines were examined for genetic diversity and evaluation of reproductive performance. Growth and reproductive performance of their progeny were also evaluated. Since mud crabs are heavily dependent on trash fish, experiments were continued to develop the AQD formulated feed and explore alternative protein sources. Survival and growth rates of crabs fed diet with 45% protein were better than those fed with 38% protein diet.



Adult mud crab used as broodstock (above); and *S. serrata* crablets produced in AQD hatchery (below)

As part of the strategy to enhance technology adoption, a project was initiated in Northern Samar (eastern Philippines), one of the major suppliers of *S. serrata* crablets to pond growers in the Philippines, in building the capacity of fisherfolk communities on nursery and grow-out rearing. The project also includes assessment of the status of wild stocks of mud crab, and the socio-economic impact of adoption of mud crab farming technology.

6.3 Marine fishes

The program on marine fishes aims to refine the broodstock management, seed production, and grow-out technologies for marine fishes and promote marine fish hatcheries for livelihood in coastal areas. Studies were implemented to address the remaining technology gaps identified for groupers, the Asian sea bass, mangrove red snapper, rabbitfish, milkfish, and pompano.

In 2008, significant progress was made in the development of AQD formulated feed for various growth phases of the marine fishes. In milkfish, fortified larval diet, as well as emulsion to enrich the rotifer, reduced the incidence of deformities in post-larvae. Potential substitutes for brine shrimp (e.g. copepods, shrimp mysids) and for trash fish were also explored and tested for carnivorous marine fishes. Mysid was found to have good potential

as live food substitute for *Artemia* in grouper larval culture. During nursery rearing, the tryptophan-supplemented diet was found to reduce cannibalism in juvenile groupers and sea bass. Studies revealed that stocking larger marine fish for nursery rearing in cages and feeding with high protein SEAFDEC diet could result in improved growth and food conversion ratio.

Concerning the pompano, *Trachinotus blochii*, successful spawning induction and seed production trials were achieved for the first time in AQD. Spawning induction, seed production as well as nursery and grow-out trials are continuing activities under the Program. Another important accomplishment during the year was the identification of molecular markers that could be used for assessing egg quality in cultured marine fishes.

Experiments on the application of compensatory growth mechanisms for milkfish reared in cages found that the alternate 2-week starvation and re-feeding cycle might work. The use of SEAFDEC formulated diet was also evaluated in various marine fishes grown in ponds. SEAFDEC diet was comparable if not better than the commercial diet. In finding alternatives to fish meal in aquaculture feed, white cowpea at 20% replacement of fish meal in grouper diets could result in growth and survival that compares well with those obtained from a fish meal based diet. In grouper, immunostimulants such as ginger, onion, ascorbic acid, and beta-glucan were tested to improve the general health status of the fish and resistance to diseases.



(from top to bottom) Sea bass, *L. calcarifer*; Sea bass juveniles fed mysids (above) and the brine shrimp (below); and Harvest of market size sea bass fed SEAFDEC AQD artificial diet at Dumangas Brackishwater Station



Harvest of market-sized grouper, *E. fuscoguttatus*, fed SEAFDEC AQD artificial diet from marine floating net cages at Igang Marine Station

Verification studies were also conducted to evaluate the application of integrated pest management to control snail infestation in ponds.



Feeding milkfish (Chanos chanos) with artificial diet in floating marine net cages at AQD's Igang Marine Station (above); and Harvest of market-sized milkfish fed artificial diet from marine floating net cages at the Igang Marine Station's Marine Aquaculture Park (below)



6.4 Small-holder freshwater aquaculture

The Program focused on generating, verifying and disseminating science-based technology for breeding, hatchery and farming of selected freshwater aquaculture commodities.

Wild stocks of freshwater prawn were assessed in terms of their genetic variation and breeding and reproduction performance. Genetic variation based on haplotype diversity was highest for the Leganes (Panay Island) *Macrobrachium rosenbergii* stock and lowest, for the Liguasan Marsh (central Mindanao) *M. mamillodactylus* outgroup stock. Initial findings of the domestication and genetic stock evaluation experiment also showed that native stocks mature after one year and 10 months compared to *M. rosenbergii* dacqueti which takes only 4-6 months. This result is the first known local record of *M. rosenbergii* maturation in captivity.



*Experimental tanks used for rearing native freshwater prawn larvae at AQD (left); and Berried *M. rosenbergii* rosenbergii from Zarraga (Iloilo, Philippines) (right)*

Investigation on the use of green and clear water for rearing freshwater prawn was completed and showed that the use of green water could improve the freshwater prawn's production performance. Significantly higher production of post larvae, and shorter time for metamorphosis (larvae to post larvae) were observed in the green water culture system.

Results of trials to produce seedstock of *M. rosenbergii* larvae tolerant to reduced salinities showed that larvae could grow and metamorphose at 6 ppt and this had no effect on their subsequent performance in grow-out tanks and/or cages. Low-salinity tolerant seedstock also grew well in tanks and cages in Laguna Lake.

Assessment of the reproductive performance of bighead carps stocked in cages in Laguna de Bay (Philippines' largest lake near Metro Manila) at different densities and feeding regimes was continued. Fertilization, hatching and fry production were not influenced by the feeding regime used (i.e. whether broodstock were fed 3, 2 or 1 month before spawning). Generally lower fertilization rate and fry production were observed in the unfed broodstock.

Experiments were continued to improve the fillet yield in tilapia through farm-based selection. Progeny testing experiments showed higher growth of the selected strain than the control especially in the third generation. In a separate experiment, various feeding management strategies in Nile tilapias reared in cages in the lakes (Lake Bato, Lake Buhi in Bicol region, northeast of the Philippines) were tested and showed that the skip-feeding management with the low feeding rate was the most economically viable among the feeding management strategies used.

Studies on the reproductive biology and development of seed production techniques for important indigenous species - climbing perch and snakeskin gourami have been initiated. Research was also continued to verify the grow-out culture of Asian catfish *Clarias macrocephalus* in net cages in Laguna de Bay.



Harvest in Lake Buhi (top photo); and harvest in Lake Bato (bottom and right photo)

6.5 Seaweed strain improvement

Research was continued to produce 'new' and improved varieties of *Kappaphycus* through tissue culture, sporulation, and protoplast fusion techniques. Soluble Seaweed Extract Powder + Plant Growth Regulators (PGR) + colchicine improved production of young plants of *Kappaphycus*.

The carposporophyte progenies of *Kappaphycus* were observed to be good sources of young seedlings. Young plants from carpospore test planted in Guimaras Island (central Philippines) showed better resistance to adverse environmental conditions compared to the commercially farmed *Kappaphycus*, e.g. better heat resistance during the months of



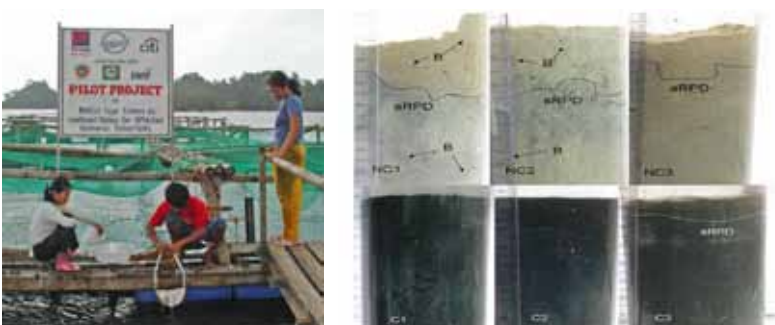
Outplanted Kappahycus alvarezii developed from tissue culture (left); and grown in small cages at AQR's Igang Marine Station (right)

April and May 2008 when crops suffered whitening due to extended exposure to heat. Carposporophyte progenies of *Kappahycus* are susceptible to 'ice-ice infection' but these surprisingly survived; hence, the plants are now propagated for experimental purposes.

6.6 Aquatic ecology

This program went full swing in its activities in 2008. AQR conducted studies which monitored the water quality in mariculture areas using chemical and biological indicators. Activities were also initiated to develop sediment quality assessment and monitoring protocols in mariculture areas. Persistent high levels of total suspended solids were observed from June to November, suggesting high organic loading mostly from uneaten feeds and fish excretion. The feeding and farm management practices within the mariculture altered the pre-existing water quality but changes appeared to be within the present cleansing capacity of the receiving system.

Results also showed that the presence of fishcages had significant effect on sedimentation rates in mariculture areas. In summary: 1) sedimentation rate in cage area immediately reflected the feeding regime; 2) hydrogen sulfide levels in sediments taken from cage area remained high even after the 3 months fallow period; and 3) there was higher redox potential and indications of faunal recovery during the fallow period.



Monitoring sediment quality in Igang Mariculture Park using a fabricated Ekman grab (left); and sediments in cage area (C) are black and sulfidic while no-cage area (NC) are brown in color, contain burrows (B) and aRPD (apparent Redox Potential Discontinuity layer) (right)

Experiments were also carried out to assess the ammonium uptake of *Gracilaria bailinae* and its impact on the combined culture with abalone, and *G. bailinae* in a recirculating system. Preliminary results showed that nitrogen uptake of *G. bailinae* increased with increasing concentrations of NH₄-N (0.5 to 40ppm) at 20 ppt and temperature range of 26-27°C. In another experiment, ammonium excretion rates of abalone fed formulated diet, abalone fed *Gracilaria* and big abalone fed *Gracilaria* peaked at 22 hours after feeding. However, excretion rates of these abalones dipped 23 hours after feeding.

Concerning the study which aims to evaluate the economic importance and ecological impact of the tangab (filter net) fishery in Iloilo Strait, a local workshop was convened to assess the status and identify issues on the subject. A revised booklet on tangab fishery was also printed.



Typical tangab catch from Calumpang, Iloilo (above); and the cage and no-cage areas located in AQD's Igang Marine Station, Guimaras (below)

6.7 Other R&D Activities

Institutional Capacity Development on Sustainable Aquaculture (ICDSA). The year 2008 saw greater focus on initiatives that would facilitate the transfer of viable aquaculture technologies developed by AQD. The ICDSA activities which include training, technology demonstration and research have achieved significant progress and are now on-going in the five provinces of the Philippines (Antique, Capiz and Guimaras in central Philippines; Northern Samar in eastern Philippines; and Misamis Occidental in northern Mindanao). The participating five provinces have benefited from several season long training courses and actual production and demonstration runs conducted in these sites for the farming of important commodities (i.e. seabass, grouper, milkfish, mud crab, abalone, freshwater fishes).

Apart from the on-going projects, potential aquaculture sites in Oriental Mindoro (South of Manila), Davao Oriental (southeastern part of Mindanao) and Aurora Provinces (northeastern part of the Philippines) were visited and assessed by the SEAFDEC team. Reports have also been prepared and these will form the basis for preparing formal agreements with the respective local government units.

ABOT AquaNegosyo. The ABOT AquaNegosyo (Agree-Build-Operate-Transfer-Aquabusiness) initiative provided technical assistance to a total of 15 clients in 2008. Technical assistance rendered included initial farm site assessment, assessment of existing culture system,

Farmers in local community of Dumarao, Capiz during the stocking of tilapia fingerlings in cages. Activity was part of the on-site aquaculture technology demonstration under ICDSA project. Success stories will be duplicated in SEAFDEC Member Countries.



preparation of facility design and project feasibility, supervision of facility construction, transport & stocking of fish, and monitoring of culture system and stocks. Five of these clients had already signed formal agreements with SEAFDEC AQD to avail of aquaculture business packages for tilapia hatchery, milkfish grow out in ponds, and multi-species pond grow out. The project also promoted AQD's aquaculture business packages through two separate fora organized for Overseas Filipino Workers.

The project also responded to queries of at least 80 clients in the Philippines and a few from other SEAFDEC non-Member Countries such as Tobago, Maldives, Greece and Ecuador. As part of the preparations for a planned project by a private company in Maldives on marine fish breeding, hatchery and cage culture, the SEAFDEC team conducted site assessments of the proposed areas in November 2008.

Training and Information Dissemination. Significant efforts were made in improving the overall visibility of SEAFDEC/AQD. In 2008, AQD researchers published 23 scientific papers in journals and books. Apart from this, information on AQD's work were disseminated through the following multi-media materials: (i) annual report, AQD Highlights 2007; (ii), 7 issues of the AQD Matters newsletter, (iii) 4 manuals, (iv) 1 handbook for training, (v) 1 pamphlet, (vi) 2 CD-DVDs, (vii) 3 videos, (viii) 6 flyers, (ix) 11 large-format posters, and (x) 1 postcard set of 11 commodities/programs.

The main AQD website was also updated 14 times and the number of unique website visitors rose to 3,158 per month, about 70% higher than the 2007 figure. Significant media coverage about AQD was also made during the year and these included 28 media appearances, publication of over 20 newspaper articles and creation of web/blog sites. In addition, AQD also participated in 11 aquaculture fairs and exhibits in Luzon and Visayas.

Capacity building is another continuing activity that achieved significant progress. Overall, 38 training sessions were conducted in 2008, a marked 43% increase from the 2007 figure. Twenty eight percent of these sessions had funding support from the Government of Japan and other international donor agencies. In terms of persons trained, over 700 national and foreign participants, representing various stakeholder groups (government officers, fish farmers, fisherfolks, students and private sector practitioners) completed the training courses.

6.8 Development of technologies and human capacity building for sustainable aquaculture

This program comprises: (i) freshwater aquaculture of indigenous species; (ii) integrated aquaculture system; (iii) coastal aquaculture and mariculture; and (iv) captive broodstock development and seed production. Although the activity components remained principally the same as in 2007, the following activities were newly included and implemented in 2008: (1) Development of tissue culture techniques for mass production of plantlets of 'new and improved' strains of *Kappaphycus*, and (2) Socioeconomic impact on the adoption of sustainable aquaculture technologies in fisherfolk communities.

Significant milestones were achieved in the implementation of the program during 2008. In giant freshwater prawn *Macrobrachium*, a mtDNA-RFLP analysis showed that the degree of genetic variation was different among the local stocks. This result will be useful for assessing genetic traits during the domestication program as a basic genetic information. A manual on the identification of commercially important freshwater prawns was published in 2008. With regards to the activity aimed at promoting the seed production of commercially important aquatic species in the coastal areas, the study showed that a slight manipulation of water temperature improves gametogenesis and consequently spawning even in tropical fish (Asian sea bass), suggesting that "climate change (global warming)" affects potentially the reproduction of tropical fish. Concerning the domestication programs on *Penaeus monodon* and mud crab, offspring (1st and 2nd generations) from wild/virus-negative broodstock has been continuously produced. There was also progress in the study on genetic variation of the shrimps and mud crab.

As part of the activity to transfer the viable technologies, three international courses were conducted in SEAFDEC/AQD and these are as follows: (i) 37-day course of International Training Course on Marine Fish Hatchery (4 of the 9 participants had Japan Trust Fund-JTF fellowship grant, May 20 - June 25, 2008); (ii) International Training Course on Abalone Hatchery (4 of the 9 participants were funded by JTF, May 07-27, 2008); and (iii) International Training Course on Crab Seed Production (One of the 4 participants funded by JTF, June 10 to July 1, 2008).



Participants of the Marine Fish Hatchery Training during the practical sessions of the Training Course (above); and Participants of the international training course on Abalone Hatchery and Grow-out held at AQD on 07-27 May 2008 (below)

Visit of AQD researchers to the soft-shell farm of Mr. Aung Naing in Kyauk Tan Tsp, Yangon with the staff and officers of Department of Fisheries and Myanmar Fisheries Federation



The training program and the publication of the above-mentioned manual also facilitated the packaging and sharing of the successful experiences between institutions or countries in the region on viable aquaculture technologies. As part of the activity in integrated aquaculture system, dissemination of rice-fish aquaculture system was further promoted by expanding activity sites in rural areas of Cambodia. The farmers involved in the activity have recognized the benefits that can be achieved from the rice-fish system. With regard to the project involving mud crab farming demonstration in Myanmar, although the project site was seriously damaged by the Cyclone Nagris and the implementation of the activities was temporarily postponed, the project was initiated in October 2008.

6.9 Establishment of disease surveillance system of aquatic animals

AQD in 2008 implemented activities, aiming to develop a surveillance system for diseases of aquatic animals in Southeast Asia through establishment of resources and facilities for fish health diagnosis and human capacity building, as follows:

R&D on refinement of diagnostic methods and development of new prevention methods for aquatic animal diseases

Recognizing that viral diseases pose a big problem in the aquaculture industry, AQD developed immunological preventive methods. Results indicate the potential of the inactivated vaccine against viral nervous necrosis (VNN) of Asian sea bass. In vaccine development of white spot syndrome (WSS) in shrimps, AQD has challenged large-scale vaccine preparation using a recombinant protein of WSS virus. The efficacy of recombinant vaccine will be assessed in 2009 under laboratory and field conditions.

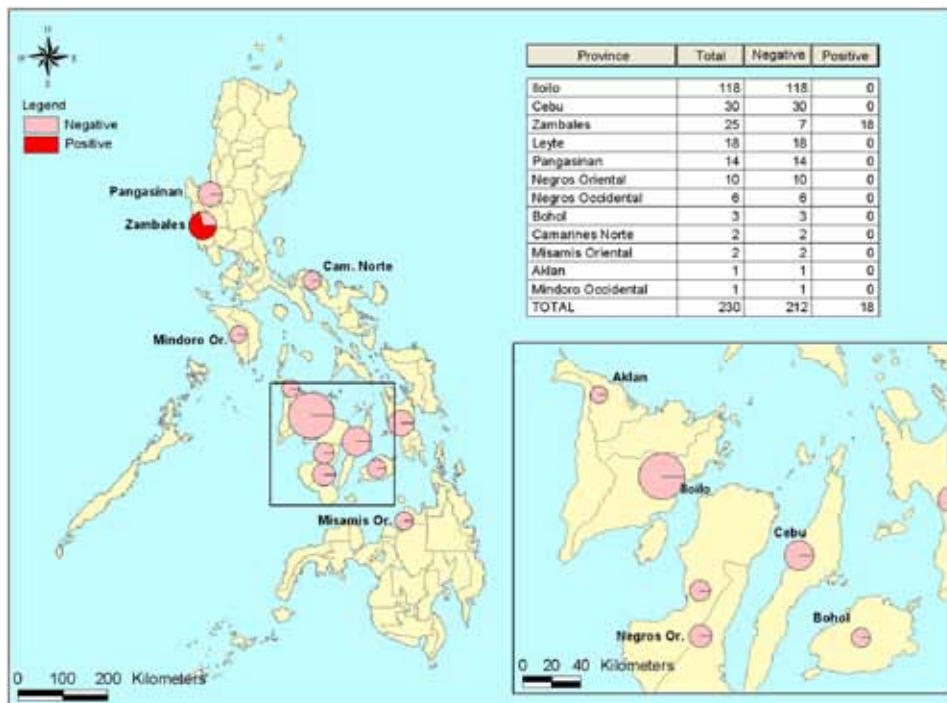
Surveillance for important viral diseases of fish and shrimps in the region, and mobile clinics

With regards to the surveillance activities of shrimps and crabs, samples of *Penaeus monodon*, *P. vannamei*, freshwater prawn (*Macrobrachium rosenbergii*) were collected from various Philippine sites. White spot syndrome virus (WSSV), infectious hypodermal and hematopoietic necrosis virus (IHHNV), Taura syndrome virus (TSV), and infectious myonecrosis virus (IMNV) were monitored for penaeid shrimps. For freshwater prawn, white tail disease (WTD) and WSSV were surveyed. Virus positive samples were obtained at 7.8 % for IHHNV and 7.6 % for WSSV, respectively. However, all samples analyzed for TSV, IMNV, and GAV, and WTD are negative. Thus, the viral diseases TSV, IMNV and WTD are still

presumed exotic to Philippines because all samples obtained from surveillance activities were tested negative for these viruses. In other Member Countries, survey of viral diseases (TS and IMN) of the Pacific white shrimp (*P. vannamei*) and surveys of giant freshwater prawn viral diseases (MrNV) were respectively implemented in Indonesia and Thailand in 2008.

Surveillance activities of emerging fish viral pathogens of KHV, SVCV and GCHV have been continued for samples of koi carp, common carp, grass carp and silver carp collected in Cambodia, Lao PDR, Myanmar, Philippines and Vietnam. To date, these fish viruses were not detected from the samples. The activity also provided mobile clinic services for Lao PDR and Philippines.

Same-age *Penaeus vannamei* from grow-out ponds in Luzon showing wide size variation typical of shrimps infected with infectious hypodermal and hematopoietic necrosis virus (IHNV)



Species: All Species; Disease: IHNV; Country: Philippines Year: 2008 Stage: All Stages Source: Hatchery/Pond/Wild

GIS map of shrimp samples analyzed for Infectious Hypodermal and Hematopoietic Necrosis Virus (IHNV) from January to September 2008

E-learning and Hands-On Training

Fish disease experts of SEAFDEC/AQD visited Cambodia and conducted the following courses: (i) On-site basic training on freshwater health management (held in Phnom Penh on 22-24 September 2008 and attended by 16 participants) and (ii) On-site basic training on marine fish health management (held in Sihanoukville on 25-27 September 2008 and attended by 14 participants). The training courses focused on basic diagnostic methods.

In addition, E-Learning course on “Principles of Health Management in Aquaculture” was conducted by SEAFDEC/AQD on July 29 to December 14, 2008. Fourteen participants were involved in the course, 7 of whom were funded by the Government of Japan Trust Fund fellowship grant.



Trainees performing the actual dissection of freshwater fish during the On-site Basic Training on Freshwater Fish Health Management held at the Inland Fisheries Research and Development Institute (IFReDI) Phnom Penh, Cambodia on 22-24 September 2008. Two AQD scientists of the Fish Health Section served as resource persons (left); and AQD Scientist and participants during the On-site Basic Training on Marine Fish Health Management held at Inland Fisheries Research and Development Institute in Cambodia on 25-27 September 2008 (right)

7. Fisheries for Food Security and Poverty Alleviation

In the Southeast Asian region, the disparity of the social and economic well-being among/within the Member Countries, particularly in the rural areas, is one of the serious development constraints. SEAFDEC therefore mobilized the regional expertise to promote the use of fisheries activities to alleviate poverty and contribute to food security in the rural areas of ASEAN countries, by providing HRD activities, covering 5 thematic areas: 1) local/indigenous institution and co-management, 2) responsible fishing technologies, 3) backyard fishery post-harvest technology, 4) rural aquaculture, and 5) inland fisheries development.

From 13 to 15 July 2008, the First Regional Technical Consultation on Fisheries Human Resources Development (HRD) for Poverty Alleviation was organized. The regional policy on the role of fisheries for the poverty alleviation was developed and the project sites for the implementation of appropriate on-site HRD activities were identified. Based on the discussion and recommendations from the Consultation, before the year end, two training courses was organized, i.e. the Training of the Trainers on Rural Aquaculture by AQD from 10 to 19 November; and the Training Course on Responsible Fishing Technology by TD from 18 to 27 November 2008.



Participants from ASEAN countries during the HRD Training on Responsible Fishing Technologies (left) and Rural Aquaculture (right)

SEAFDEC also supported the activities to introduce and promote “One Village, One Fisheries Product” or FOVOP in order to improve fisheries livelihood, enhance the role of women in the fishing community, and eventually alleviate the over-fishing capacity situation in the ASEAN Member Countries. From 24-27 March 2008, the 1st Regional Technical Consultation (RTC) on FOVOP was organized to introduce the project concept and exchange experiences from Japan on the development of One Village, One Product, (OVOP), Thailand on the “One Tambol, One Product, (OTOP)” and other ASEAN countries. Following the RTC, the Regional HRD Workshop on Identification of Potentials and Problem Areas for the Promotion of FOVOP in the ASEAN Region was organized from 18 to 22 August, and the “Regional Strategy for the Promotion of FOVOP in the ASEAN Region” as well as the Reference document on “Potential FOVOP Products and Services in the ASEAN Region” were developed. Individual countries also developed their respective National Proposal for the case study on the promotion of FOVOP to be implemented in 2009.



Freshwater aquaculture also plays multi-functionality important roles particularly in the remote rural areas of Southeast Asia. The need to balance socio-economic and environmental dimensions in the development of freshwater aquaculture particularly for the poor is important. Since 2007, SEAFDEC therefore promoted a program on sustainable freshwater aquaculture for rural communities through human capacity building for the Member Countries via the introduction of appropriate aquaculture technologies which are applicable for the remote, rural areas of countries in the region in order to provide a source of food



The Regional Technical Consultation (RTC) on FOVOP (above); and the Regional HRD Workshop on Identification of Potentials and Problem Areas for the Promotion of FOVOP in the ASEAN Region (below)

and better livelihood, and alleviate the poor socio-economic conditions of people living in the areas. In 2008, the 2nd Joint Regional Training on Community-based Aquaculture for Remote Rural Areas of Southeast Asia was conducted from 1 to 14 September in Lao PDR. The training comprises lectures, practical sessions, demonstrations, study visits and group discussions mobilizing knowledge and experiences of the partner agencies, i.e. the Department of Livestock and Fisheries (DLF) of Lao PDR, the Department of Fisheries (DOF) of Thailand, Mekong River Commission Fisheries Programme (MRC-FP), the World Wide Fund for Nature (WWF) in Lao PDR, and the Asian Institute of Technology (AIT).



The 2nd Joint Regional Training on Community-based Aquaculture for Remote Rural Areas of Southeast Asia

8. Activities in Response to the Emerging Needs and Concerns

SEAFDEC starting from 1999 has been supporting the Member Countries in reviewing the emerging international fish trade related issues and problems that may affect fisheries activities in the region, and in developing joint/harmonized approaches to address the issues. From 12 to 14 February 2008, SEAFDEC hosted the ASEAN-SEAFDEC RTC on International Fisheries Related Issues 2008 in Thailand to review and discuss the identified important international fisheries related issues relevant to the region, i.e. Legally-binding Instrument on Port State Measures, Traceability, Certification and Labelling, Small-scale Fisheries Issues, Fisheries Subsidies, Endangered Aquatic Species under CITES, Climate Change and Fisheries, and Welfare of Fishing Crew and Fishing Labour. SEAFDEC also developed the 'Executive Summary on International Fisheries Related Issues 2007-2008'.



Another RTC was organized from 15 to 16 July 2008, to review and discuss important issues relevant to emerging fisheries policies of the region especially climate changes and its impact to fisheries and aquaculture, and the market driven measures and food security through the promotion of fish trade. The Consultation was able to come up with the recommendations and future activities of both issues



The first and second RTC organized in 2008 to discuss the international fisheries related issues

specifically the measures and activities to mitigate the impacts of climate change to be undertaken by SEAFDEC and agencies responsible for fisheries in the Member Countries.

SEAFDEC, considering the socio-economic importance and multi-functionality of small-scale fisheries to food security and local development, has long been implementing issues to support sustainable small-scale fisheries. As the global concerns which were previously focused to ensure sustainable development of the high seas and commercial fisheries have been recently expanded to also address the issues related to small-scale fisheries; SEAFDEC from 29 April to 2 May 2008 organized the Regional Technical Consultation on Small-Scale Fisheries in Southeast Asia, and the “Coordinated Position for the Promotion of Sustainable Small-scale Fisheries in Southeast Asia” was adopted by the countries in the region as a regionally harmonized approach for sustainable development of small-scale fisheries. This regional initiative was also presented during the Global Conference on Small-scale fisheries subsequently organized by FAO from 13 to 17 October 2008 in Thailand.

9. Enhancing SEAFDEC Visibility and Human Capacity Development

Since its establishment, SEAFDEC has undertaken various activities and regularly developed information materials to support sustainable development of fisheries in Southeast Asia. The common policy framework for information-related activities of the organization is the Information Strategies for Enhancing SEAFDEC Visibility and Communication, endorsed by the SEAFDEC Council in 2006. The Information Strategies envisions that: “SEAFDEC shall be a sustained and unified Centre of Excellence for Tropical Fisheries Information, accessible to all committed to sustainable fisheries development and food security, working for the benefit of its Member Countries, in close collaboration with the ASEAN and fishery related organizations regionally and globally.” Eight Strategies were identified: 1) Production of relevant, timely, and useful information materials to meet the requirements of the target audience; 2) Capacity development of information staff at all levels; 3) Enhance the accessibility of SEAFDEC information to target groups; 4) Strengthen cooperation and networking with other organizations; 5) Enhance internal communication and information sharing; 6) Raising SEAFDEC image at international, regional and national levels; 7) Sustainability of financial support for information and communication activities; and 8) Regular monitoring and evaluation of information activities. From 30 October to 1 November 2008, the 9th SEAFDEC Information Staff Exchange Program (ISEP) Meeting was organized to review the annual information activities of SEAFDEC, review the implementation of the Information Strategies, and provide capacity building opportunity for the information officers in the related fields.

The activities implemented in 2008 that contributed to the promotion of SEAFDEC activities and visibility are:

- Production and dissemination of information materials (SEAFDEC publications, and articles published in other scientific journals/proceedings)
- Establishment and administration of websites (SEAFDEC and Departmental websites)
- HRD activities, e.g. through training courses and the HRD session during the ISEP Meeting, etc.
- Provision of library services, on-line information services, and other services
- Arrangements of exhibition and promotional events
- Enhancement of internal communications and information sharing through the use of e-mail communication and e-groups

- Implementation of collaborative activities to strengthen cooperation and networking with other organizations
- Raising SEAFDEC image at international, regional and national levels through the organization of meetings, trainings, the active participation at events organized by other organizations, the development of Press Statements for SEAFDEC regional events, and the development of common/coordinated position of the region reflected at the international fora.



Some of the information-related activities undertaken by SEAFDEC Secretariat and departments

Regional Advisory Committee for Fisheries Management in Southeast Asia (RAC)

With the endorsement of the SEAFDEC Council during its 40th Meeting in April 2008, the Regional Advisory Committee for Fisheries Management in Southeast Asia or RAC was established as a subsidiary body of the SEAFDEC Council to assist the SEAFDEC Member Countries in achieving the sustainable utilization of fisheries resources and provide technical/scientific advice to the SEAFDEC Council. The First Meeting of RAC was organized From 22 to 24 September 2008, with the participation of the RAC standing members and representatives from the ASEAN-SEAFDEC Member Countries. During the first RAC Meeting, important issues raised for discussion include: the Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating Illegal, Unreported and Unregulated (IUU) Fishing in the Region; Fisheries Licensing in the Southeast Asian region; Offshore Fisheries Management in the Southeast Asian Countries; Data and Information related issues; Aquaculture Feeds and Utilization of Fishery Resources; Utilization of the M.V. SEAFDEC 2 for Sub-regional Fisheries Survey; and the Coastal Fisheries Management concept and approach as undertaken in Japan.



Based on the presentations and discussions on the issues and initiatives relevant to fisheries management in the region, the Committee developed and adopted the Regional Policy Recommendations to Improve Fisheries Management in Southeast Asia (2008). The outcomes and recommendations were shared with the SEAFDEC Member Countries during the 31st Meeting of SEAFDEC Program Committee Meeting for information, and will be submitted to the forthcoming Meeting of the SEAFDEC Council in early 2009 for consideration and endorsement.



The First RAC Meeting held in 2008

Cooperation with Donors and Partner Organizations

ASEAN Foundation

SEAFDEC started the close collaboration with the ASEAN Foundation in 2000 during the preparation for the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People” (2001), of which the Resolution and Plan of Actions were developed and are still being used as the policy framework and priority actions for fisheries development programs/projects of the region. In 2008, collaboration between SEAFDEC and the ASEAN Foundation was carried out through the programs on: 1) Promotion of “One Village, One Fisheries Products (FOVOP)” System to Improve the Livelihood for the Fisheries Communities in ASEAN Region (2007-2009), and 2) Human Resource Development (HRD) on Poverty Alleviation and Food Security by Fisheries Intervention in



the ASEAN Region (2008-2010), which are financially supported by the ASEAN Foundation and implemented by SEAFDEC Secretariat and Departments.

Signing of the contract for the project supported by ASEAN Foundation on “HRD on Poverty Alleviation and Food Security by Fisheries Interventions in the ASEAN Region”

Asia-Pacific Fisheries Commission

From 6-9 August 2008, representatives from SEAFDEC participated in the Asia-Pacific Fisheries Commission (APFIC) Regional Consultative Forum Meeting, Manado, Indonesia, which was organized to synthesize, analyze, and agree on actions needed to “adapt to emerging challenges, promoting effective managing fisheries and aquaculture in the Asia-Pacific region”. The Meeting reviewed the policy and action plans to address the key issues, namely: the certification of fisheries and aquaculture, and addressing fisheries overcapacity and IUU fishing; the success in the implementation of activities by regional organizations; and explored the future works to be conducted, e.g. the use of ecosystem approach in the implementation of the CCRF, the use of market linkages, trade and finance to reduce vulnerability and increase resilience of livelihood. In addition, SEAFDEC also made a presentation on “Opportunities for a regional management mechanism in the SEAFDEC-ASEAN sub-region.

SEAFDEC Secretary-General and other SEAFDEC representatives participated in the 30th Session of APFIC from 11-13 August 2008 to provide inputs to the APFIC Session on SEAFDEC’s efforts and achievements under its program of activities in addressing issues relevant to APFIC’s strategy and promotion of regional initiatives for more effective fisheries management, including the ASEAN Regional Fisheries Development and Management Mechanism and new Framework for Fishery Statistics of Southeast Asia; as well as to the regional themes: Certification in fisheries and aquaculture; Capacity management and combating IUU fishing; Policy, emerging issues and implementation of CCRF; and

Small-scale fisheries. In addition, SEAFDEC also agreed to continue working closely with APFIC in promoting the proper utilization of living aquatic resources through sustainable development and management in the ASEAN region.

Association of the Southeast Asian Nations

Since 1998, technical cooperation between ASEAN and SEAFDEC towards sustainable fisheries development has been initiated under the regional ASEAN-SEAFDEC Fisheries Consultative Group Mechanism (FCG) framework. To assure that the efforts of ASEAN and SEAFDEC in tackling a number of challenges that have impacts on the development and management of the fisheries sector are sustained, and in support of various activities for the benefit of Member Countries, the ASEAN-SEAFDEC Strategic Partnership (ASSP) was formalized in 2007 in Bangkok, Thailand. From such partnership, 21 programs were implemented under the ASEAN-SEAFDEC ASSP-FCG framework. It is envisaged that the ASEAN-SEAFDEC fisheries cooperation would lead to the sustainable development of fisheries, and the upliftment of the well-being of people in the Southeast Asian region.

In addition to the technical programs, the areas of cooperation between ASEAN and SEAFDEC also covered: the cooperation in the Implementation of the ASEAN Roadmap for Integration of the Fisheries Sector; the establishment of ASEAN Regional Fisheries Management Mechanism (ARFMM); the ASEAN Shrimp Alliance (ASA); and the establishment of the ASSP Portal Website (under development process). SEAFDEC also participated in the 16th Meeting of ASEAN Sectoral Working Group on Fisheries (21-23 May 2008, Bangkok, Thailand) and the Special SOM 29th AMAF (5-7 August 2008, Chiangmai, Thailand), where the progress of the ASEAN-SEAFDEC collaborative programs as well as other areas of cooperation were reported and discussed.

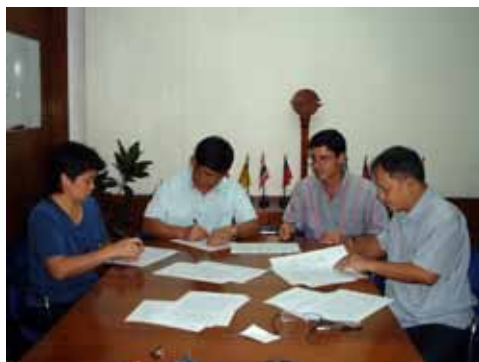
Australian Centre for International Agricultural Research

SEAFDEC/AQD entered into a Contract of Agreement with the Commonwealth of Australia represented by the Australian Centre for International Agricultural Research (ACIAR) last January 2008 to provide technical services on abalone. These services include undertaking an assessment mission to Eastern Indonesia to provide recommendations to ACIAR on R&D investment opportunities which could enhance the production and profitability of their abalone industry. Such assessment will take into account the smallholder agribusiness development initiative of ACIAR in Indonesia.

Ecuador's National Institute of Fisheries

SEAFDEC/AQD signed an Agreement with Ecuador's National Institute of Fisheries on 3 December 2008 for a 2-year collaboration, which involves the evaluation of endogenous marine finfish in Ecuador for aquaculture and the feasibility of establishment of multi-species marine

Officials of SEAFDEC/AQD and Ecuador National Institute of Fisheries during the signing of Contract of Agreement



fish hatchery; provision of technical assistance in the establishment of demonstration facilities for seed production (hatchery and nursery) and grow-out (ponds and cages) of multi-species marine fishes; and implementation of training programs on marine fishes in Ecuador.

Faculty of Fisheries, Kagoshima University of Japan

With the aim of retaining the objectives of the original SEAFDEC and KUFF collaboration signed in 2003, which are to: 1) sustain the development of fisheries in the Southeast Asian region; 2) build significant channel for exchange programs on educational and training for staff members and students; and 3) look for means of exchanging data from researches, SEAFDEC Secretariat and KUFF have agreed to continue the cooperation and extend the Arrangement for another five years in order to promote academic and educational cooperation and research in the area of mutual interest. Considering that the original Arrangement was signed on 3 December 2003 and after five years of the cooperation, SEAFDEC and KUFF have achieved fruitful success in their goals and mutual benefits, and since the first five-year Arrangement terminated in 2008, the two organizations considered and decided to continue the cooperation and extend the Arrangement for another five years. The renewal of the Arrangement was signed on 24 December 2008.

Food and Agriculture Organization of the United Nations

In 2008, SEAFDEC participated in the meetings organized by FAO: the Regional Stakeholders Workshop in Asia on Statistical Programme (9 May 2008, at FAO RAP, Bangkok, Thailand), the 11th Session of the Sub-Committee on Fish Trade and the Resumed Session of the Technical Consultation for Technical Guidelines for Responsible Fish Trade, (2-6 June, Bremen Germany), the Technical Consultation to Draft a Legally-binding Instrument on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (23-27 June 2008, Rome, Italy); and the COFI - 4th Session of the Sub-Committee on Aquaculture (6-10 October 2008, Puerto Varas, Chile). In addition, SEAFDEC also took part in the Global Conference on Small-Scale Fisheries (13-17 October 2008, Bangkok, Thailand) as one of the co-organizers.

In 2008, three Letter of Agreements were signed for the conduct of collaborative activities between SEAFDEC Training Department and FAO for: 1) the Support to the "Workshop on Assessment and Management of the Offshore Resources of South and Southeast Asia"; 2) the support of the FAO Regular Program on "Safety at Sea Measure"; and 3) the support of GEF Project on "Guidelines and advice for harvesting technologies in deep waters and environmentally sensitive areas".

The "Workshop on Assessment and Management of the Offshore Resource of South and Southeast Asia" was jointly organized by TD and FAO in June 2008, aiming to review and synthesize the existing information on the status of offshore resources in South and Southeast Asia, and evaluate the feasibility of developing new fishing activities targeting the offshore resources. Also in June 2008, FAO through its Regular Program agreed to provide technical assistance to TD for the development of Safety at Sea Measures through a case study on the relationship between Safety at Sea and Fisheries Management in the purse seine fishery and the trawl fisheries in Thailand. The survey was conducted in southern part of Thailand, and the report has been prepared and presented during a related workshop.

This case study was a part of the international study on the effects and inter-relationship between Safety at Sea and Fisheries Management regimes.

In October 2008, FAO and TD cooperated for the development of Guidelines and advice for harvesting technologies in deep water and environmentally sensitive areas. The activities of this collaboration included the preparation of annotated drawings rendered in three dimensional illustrations of commercial fishing gears in electronic format and preparation of thirteen re-drawn annotated three dimensional illustrations of commercial fishing gears based on illustrations provided by FAO.

Coordinating Working Party on Fishery Statistics (CWP) and Fisheries Resources Monitoring System (FIRMS)

SEAFDEC has been actively participating member of CWP and has played important roles in developing standards and norms on fishery statistics including aquaculture to reflect regional specificity of the region at global level. In 2008, SEAFDEC has made continuous support and substantial contribution toward establishment of International mechanism for standard setting and coordination for aquaculture data and information for development and improvement of aquaculture statistics (developing standards and classification of Aquaculture Statistics at global and regional level; and promotion on the implementation of Strategy STA (Aquaculture) for usage of Statistics for assessment and management), through the participation at the Expert Meeting in Nakon Nayok, Thailand in January 2008; and the First Meeting of CWP on Aquaculture held in Puerto Varas, Chile, from 3-4 October, 2008, in conjunction with the 4th COFI Sub-Committee of Aquaculture (COFI/AQ/IV).

Besides, from 7-9 July 2008, SEAFDEC participated in the Inter-sessional Meeting of the Coordinating Working Party on Fishery Statistics (CWP) 2008 and the Inter-Sessional Meeting of FIRMS Steering Committee, hosted by Northwest Atlantic Fisheries Organization (NAFO) Head Quarter in Halifax, Canada. The Meeting discussed many of the issues related to fishery statistics and information that are of regional importance and identified as high priority e.g. proposed revised demarcation of the boundary between FAO Major Fishing Areas 57 and 71, International Standard Statistical Classification of Fishing Gear (ISSCFG), and Vessels (ISSCFV); New Data Requirement and New Data Sources, including standardization and harmonization of format, criteria and definition for MCS-related data including VMS information and VMS combining with other information (e.g. Catch report), incidental catch data collection, socio-economic information, and data in relation to area closers, and consolidation of global records; review the criteria used to decided for listing as IUU; Type of data useful for Ecosystem management approach including its standard; Tuna Catch Statistics for Southeast Asia; Regional development on national STF in Southeast Asia that in line with FishCode-STF, and SEAFDEC's input on development of Inventory on Marine Resources and Fisheries; and FIRMS Website.

Japan International Cooperation Agency (JICA)

At MFRD, the MFA-JICA Seafood Safety Management Course was successfully conducted, from 14 January to 1 February 2008. The course was sponsored by Singapore's Ministry of Foreign Affairs (MFA) and the Japan International Cooperation Agency (JICA) and organized by Agrifood Technologies Pte Ltd (ATP) in collaboration with the Agri-Food and Veterinary Authority of Singapore (AVA). During the course, a Japanese expert was supported by JICA to

conduct lectures on the microbiological aspects of the course; while technical officers from MFRD also involved in conducting the lectures and practical sessions together with two senior officers from the AVA.

The objectives of the course were to provide government management and laboratory officers with an overview of seafood safety requirements and to train the officers in the various elements of seafood safety and in the analysis of various chemical contaminants as well as in the application of the Hazard Analysis Critical Control Point (HACCP) quality assurance system. A total of 19 trainees from 11 different countries, namely, Brunei, Cambodia, Madagascar, Maldives, Myanmar, Philippines, Samoa, Sri Lanka, Timor Leste, Tonga and Vietnam, attended the course.



Participants of the MFA-JICA Course

National Fisheries University of Japan

The collaboration between SEAFDEC and the National Fisheries University (NFU) of Japan was established since 2005 to assist Member Countries on fisheries resources survey in collaboration with NFU. From 6 to 10 June 2008, SEAFDEC in collaboration with the NFU and in cooperation with the Department of Fisheries of Thailand conducted a joint Fisheries Resources Survey in the Central Gulf of Thailand using the NFU research vessel, the “TENYO MARU”. The survey aimed to assess the distribution and abundance of demersal and pelagic fishery resources through hydro-acoustic survey. In addition, to support the hydro-acoustic surveys, biological samplings using bottom trawl, Isaacs-Kidd Mid-water Trawl (IKMT), MTD net, and oceanographic survey using the CTD sensors were also undertaken.

Under the SEAFDEC-NFU collaboration framework, the Collaborative Research Program between the NFU and the RIMF of Vietnam was also discussed; and the joint survey for small pelagic fisheries resources in the central part of Vietnam was carried out from 7 to 18 November 2008, using the “KOYO MARU” of the NFU. The project aimed to assess the distribution and abundance of small pelagic fisheries resources by means of hydro-acoustic survey in the EEZ, particularly in the central part of Vietnam. Also, biological samplings by mid-water trawl and oceanographic survey using the CTD will be taken to support the hydro-acoustic survey.

North Carolina State University (USA)

SEAFDEC/AQD continued its partnership arrangement with North Carolina State University for the implementation of the Philippine portion of the USAID-funded cooperative research program entitled ‘Improved Cost Effectiveness and Sustainability of Aquaculture in the Philippines and Indonesia’. Under this partnership arrangement, AQD is responsible for conducting a 3-year research project on the “Alternative Feeding Strategies to Improve Milkfish Efficiency in the Philippines”. The project involves evaluating the efficacy of feed schedules that incorporate different increments of feed restrictions and re-feeding on

milkfish production characteristics and the compensatory (catch-up) growth response in marine and brackishwater tanks, and the efficacy of alternate feed schedules on full grow-out trials in brackishwater ponds and fish cages in marine environment.

Swedish International Development Cooperation Agency

Collaboration between SEAFDEC and the Swedish International Development Cooperation Agency (Sida) in 2008 was extended from the activities of 2007 and focused primarily on the program on “Support the implementation of the Code of Conduct for Responsible Fisheries”. The programs comprise components on supporting the establishment of regional fisheries management body/mechanism in Southeast Asia; improving the capacity for the management of fisheries and important coastal fisheries (refugia) and the protection against natural hazards; and understanding on the size and structure of large-scale (or industrial) fisheries and capacity strengthened to monitor and record active fishing efforts in coastal fisheries.

In 2008, the highlighted activities and achievements include the support to the establishment of the ASEAN Regional Fisheries Management Mechanism (ARFMM) under the ASEAN framework, the ASEAN-SEAFDEC Consultation on the ASEAN Roadmap for the Integration of the Fisheries Sector; and the SEAFDEC involvement in the “Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating Illegal, Unreported and Unregulated (IUU) Fishing in the Region”. In addition, a new program on Support to Tsunami Rehabilitation of Affected Countries in the ASEAN Region is being proposed by SEAFDEC to Sida for consideration and funding support.

United Nations Environmental Programme/Global Environmental Facility

TD collaborated with the UNEP/GEF on the organization of the “Advanced Regional Training Workshop on Larval Fish Identification and Fish Early Life History Science” from 26 May to 15 June 2008 at the Training Department in Samut Prakan, Thailand. The Regional Training Workshop was aimed at providing practical experiences on fish identification to the participants (eighteen fish larval researchers from Cambodia, Indonesia, Malaysia, the Philippines, Thailand and Vietnam). The participants were provided with advanced lessons and skills on fish larvae identification to the genus/species level and illustration of the fish larvae. The guide book “Early Stages of Marine Fishes in Southeast Asian Region”, was drafted as an outcome of the workshop, and was expected to be a useful reference for future fish larvae studies in the Southeast Asian region.

From 2-5 June 2008, SEAFDEC also participated in the 10th Meeting of Regional Working Group for Fisheries Component of the UNEP/GEF Project: “Reversing environmental degradation trends in the South China Sea and Gulf of Thailand” (Busuanga, Palawan, Philippines) to discuss the possible joint program of activities between SEAFDEC, particularly under the SEAFDEC-Sida collaboration, and the future UNEP/GEF fisheries refugia project.

SEAFDEC Programs in the Year 2009

In the Year 2009, SEAFDEC would continue most of the programs implemented in 2008, in line with the region's priority areas identified by the SEAFDEC Program Committee and the directives given by the SEAFDEC Council and the ASEAN-SEAFDEC Strategic Partnership (ASSP) Fisheries Consultative Group (FCG) Mechanism. SEAFDEC would continue the development of fisheries and aquaculture technologies to support sustainable development of the fisheries sector; while priority would particularly emphasize on: responsible fisheries in line with the Code of Conduct for Responsible Fisheries, the contribution from fisheries to food security, and poverty alleviation. In this connection, the linkages between fisheries and the environment, as well as the introduction/provision of fisheries-related technologies that are applicable for small-scale fishers and rural communities would be given special emphasis. In addition, SEAFDEC would continue to discuss: the global emerging issues and situation including the requirements for food safety and the region's compliance with the regulations imposed by the major importing countries to ensure sustainability of fisheries; the environmental-related issues and requirements for conservation and management of marine species, and adaptation of impacts from climate change; and the global economic situation which would impact all production sectors of the world including the fisheries sector of the Southeast Asian region.

SEAFDEC Program in the Year 2009

SEAFDEC Programs of activities proposed for 2009 were scrutinized by the 31st SEAFDEC Program Committee and would be further proposed to the 41st SEAFDEC Council, for consideration and endorsement. The programs include:

Departmental Programs

1. Center-wide Information Network (Secretariat)
2. Information and Communications Technology (TD)
3. Tailor Made Training and Study Tour (TD)
4. Integrated Mollusc Production (AQD)
5. Mud Crab and Shrimp Domestication (AQD)
6. Marine Fish (AQD)
7. Small-holder Freshwater Aquaculture (AQD)
8. Seaweed Strain Improvement (AQD)
9. Aquatic Ecology (AQD)
10. Other R&D Activities (AQD)

ASEAN-SEAFDEC ASSP-FCG-Programs

1. Support to the Implementation of Code of Conduct for Responsible Fisheries (Secretariat)
2. Assistance for Capacity Building in the Region to Address International Trade Related Issues (Secretariat)
3. Promotion of Rights-based Fisheries and Co-management towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management (TD)
4. Improvement of Fishery Statistics and Information for Planning and Management of Fisheries in the ASEAN Region (Secretariat)
5. Responsible Fishing Technologies and Practices (Fishing in Harmony with Nature) (TD)
6. Sustainable Utilization of Potential Fisheries Resources and Reduction of Post-harvest Losses (TD)

7. Development of Technologies and Human Capacity Building for Sustainable Aquaculture (AQD)
8. Quality Assurance Systems for Small and Medium-sized Fish Processing Establishments in ASEAN Member Countries (MFRD)
9. Environmental Related Tasks in Southeast Asia (Secretariat)
10. Establishment of Disease Surveillance System of Aquatic Animals (AQD)
11. Chemical and Drug Residues in Fish and Fish Products in Southeast Asia (MFRD)
12. Research and Development (R&D) of Stock Enhancement of Species under International Concerns (AQD)
13. Research for Stock Enhancement of Sea Turtles (MFRDMD)
14. Capacity Improvement of Fisheries Community for Fisheries Management and Alleviation of Poverty (TD)
15. Support to Tsunami Rehabilitation of Affected Countries in the ASEAN Region (Secretariat)
16. Fisheries Resource Survey and Operational Plan for M.V. SEAFDEC 2 (TD)
17. Deep Sea Fisheries Resources Exploration in the Southeast Asia (TD)
18. Tagging Program for Economically Important Pelagic Species in the South China Sea and Andaman Sea (MFRDMD)
19. Promotion of "One Village, One Fisheries Products (FOVOP)" System to Improve the Livelihood for the Fisheries Communities in ASEAN Region (Secretariat)
20. Information Collection of Highly Migratory Species in Southeast Asia Waters (TD)
21. Development of Regional Database for Fishery Management (TD)
22. Human Resource Development (HRD) for Poverty Alleviation and Food Security by Fisheries Intervention in the ASEAN Region (Secretariat)

Non-funded ASEAN-SEAFDEC FCG-ASSP Programs

1. Rehabilitation of Fisheries Resources and Habitats/Fishing Grounds through Resource Enhancement (TD)
2. The Use of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region (MFRDMD)
3. Development of Integrated Inland Fisheries Management in ASEAN Countries (TD)
4. Utilization of Freshwater Fish in ASEAN Member Countries (MFRD)
5. Good Laboratory Quality Management in ASEAN Member Countries (MFRD)

Other Programs

1. Promotion of Set-Net: an Eco-friendly Fishing Gear of Sustainable Coastal Fisheries Management (TD)
2. Information Collection for Economical Important Species: as Surimi Raw Materials (TD)
3. Cetacean Research in Southeast Asian Waters: Cetacean Sighting Program (TD)
4. Promotion of Sustainable Freshwater Aquaculture for Rural Communities (Secretariat)
5. Promotion of Inland Small-scale Fisheries Management through Rights-based Fisheries and Co-management Towards Institutional Building and Participatory Approaches (TD)

The challenge that lies ahead is therefore how SEAFDEC, in close collaboration with partner agencies, could help the Member Countries in balancing the contributions from fisheries to national economy development and food security, and alleviation of the livelihood particularly for the disadvantaged groups of people; while safeguarding the Member Countries' interests and welfare against the possible unfair treatment within the emerging global concerns and requirements by the international society.

SEAFDEC Visibility

In order to enhance SEAFDEC visibility, the SEAFDEC Council endorsed the Information Strategy for Enhancing SEAFDEC Visibility and Communication” in 2006. Under the Information Strategy, it is envisioned that “SEAFDEC shall be a sustained and unified Centre of Excellence for tropical Fisheries Information, accessible to all committed to sustainable fisheries development and food security, working for benefit of its Member Countries, in close collaboration with the ASEAN and fishery related organizations regionally and globally;” and eight Strategies were identified. In the year 2008, activities implemented in-line with each Strategy could be summarized as follows:

Strategy 1: Production of relevant, timely, and useful information materials to meet the requirements of the target audience

- Production of SEAFDEC Information Materials:
 - o 78 titles/issues of promotional materials (with 44,706 copies produced and 36,581 copies distributed)
 - o 60 titles of technical materials (with 10,305 copies produced and 6,094 copies distributed);
 - o 24 papers/articles published in scientific journal/proceedings.
- Establishment and administration of SEAFDEC Websites (SEAFDEC Integrated Homepage and Departmental websites) with a total of 96,753 unique visitors, 275 links from other websites, and 12,701 annual download.

Strategy 2: Capacity development of information staff at all levels

- Provision of HRD activities for SEAFDEC information-related staffs based on requirement, and during the annual ISEP Meeting
- Obtaining library materials in SEAFDEC Secretariat and departmental libraries which also help enhancing the capacity of SEAFDEC staff. A total of 1,283 issues of Newsletter and serial publications, 534 titles of books, reports and technical publications, and 222 Audio-visual materials were added up in the libraries during the year

Strategy 3: Enhance the accessibility of SEAFDEC information to target groups

- Provision of library services, and on-line information services
- Establishment of networking with a total of 360 libraries within and outside the region
- Distribution of a total of 9,553 copies of publications to target group
- Provision of a total of 174 downloadable materials in the Websites
- Arrangement of exhibition: A total of 22 exhibitions were conducted to display the activities of SEAFDEC, with the total number of visitors of 45,510 persons to the booth.
- Visitors to SEAFDEC: 12089 visitors directly visited SEAFDEC Secretariat and Departments

Strategy 4: Strengthen cooperation and networking with other organizations

- Establishment of collaborative agreement/ implementation of collaborative activities with 32 fisheries-related organizations at national, regional and international levels
- Receiving a total of USD 2,398,102 from non-regular sources for the implementation of programs/activities

- Establishment of Regional Fisheries Policy Network (RFPN) (members stationed at the Secretariat and virtual members) to enhance coordination between SEAFDEC and Member Countries on technical/policy matters

Strategy 5: Enhance internal communication and information sharing

- Establishment of e-mail and e-group communication systems (all Departments)
- Production of regular internal Newsletter (TD and AQD)

Strategy 6: Raising SEAFDEC image at international, regional and national levels

- Organization of events:
 - o Regional/International meetings, seminar, workshop (26 meetings with 932 participants)
 - o National/local meeting, seminar, workshop, consultation, etc. (5 meetings with 135 participants)
 - o International/regional training course (27 courses with 409 trainees)
 - o National, On-site training courses (29 course with 648 trainees)
 - o Study tour (26 program with 280 trainees)
 - o Internship (59 persons)
 - o On-the-Job training (34 college with 188 students)
- Participation to events organized by other organizations
 - o Meeting at regional/international level (43 meetings, with 83 participants from SEAFDEC)
 - o Meeting at national/local level (49 meetings with 123 participants from SEAFDEC)
- Sending mission to visit member countries (2 missions, with 11 staffs)
- Production of Press Statements (20); while the appearance in press was also monitored (314)
- Preparation of common/coordinated position of the region reflected at the international for a (2)
- Development of questionnaire to evaluate SEAFDEC image at international, regional and national levels (to be used in 2009)

Strategy 7: Sustainability of financial support for information and communication activities

- Selling of technical publications and souvenir items under a cost recovery basis
- Regularly reviewing the mailing list of SEAFDEC publications
- Digitizing publications and making them available for download from the websites.

Strategy 8: Regular monitoring and evaluation of information activities

- Organization of the Ninth SEAFDEC Information Staff Exchange Program (ISEP) Meeting to monitor the implementation of information activities and visibility of SEAFDEC

SEAFDEC Incomes and Expenses in the Year 2008

Un-Audited Abridged Consolidated Financial Statements for the Year 2008 (In US\$)

| | 2008 (Un-audited) | 2007 |
|-------------------------------------|-------------------------|-------------------------|
| INCOME | | |
| Contributions from :- | | |
| Member governments | 5,971,967 | 6,269,324 |
| Other sources | 843,487 | 721,866 |
| Total Income | 6,815,454 | 6,991,190 |
| EXPENDITURES | | |
| Operating and Capital Expenditures | | |
| Research | 809,549 | 875,186 |
| Training | 587,426 | 675,624 |
| Information | 692,010 | 725,788 |
| Collaborative | 152,115 | 151,041 |
| Administrative | 4,644,079 | 4,626,685 |
| Total Expenditures | 6,885,179 | 7,054,324 |
| SURPLUS (DEFICIT), For the year | (69,725) | (63,134) |
| FUND BALANCE, Beginning of year | 4,845,141 ^{1/} | 5,217,107 |
| FUND ADJUSTMENT | 0 | (7,363) |
| FUND BALANCE, End of year | 4,775,416 | 5,146,610 ^{1/} |
| REPRESENTED BY : | | |
| Cash at Bank | 4,499,986 | 4,954,066 |
| Receivables | 149,741 | 167,026 |
| Advances and Deposits | 162,138 | 157,820 |
| Supplies Inventory | 67,782 | 51,590 |
| Fuel oil for vessels | 54,020 | 67,794 |
| Prepayments | 16,378 | 18,858 |
| Total Current Assets | 4,950,045 | 5,417,154 |
| Termination indemnity fund | 1,526,464 | 1,552,274 |
| Other assets-Net | 7,798 | 196,271 |
| Total Assets | 6,484,307 | 7,165,699 |
| Less : Liabilities | | |
| Accrued payables | 182,427 | 293,595 |
| Fund held in trust | 0 | 173,220 |
| Provision for termination indemnity | 1,526,464 | 1,552,274 |
| Total Liabilities | 1,708,891 | 2,019,089 |
| NET ASSETS | 4,775,416 | 5,146,610 |

Remark:

^{1/} The difference of US\$ 301,469 is a result of the varying exchange rates of the US\$.

Un-audited contribution received by SEAFDEC from Member Countries and other sources of funds for the year 2008 (In US\$)

| Sources | Secretariat | TD | MFRD | AQD | MFRDMD | Total | |
|-----------------------------|----------------|------------------|--------------|------------------|----------------|------------------|------------|
| | | | | | | In US\$ | % |
| Brunei | 7,000 | | | | | 7,000 | 0.1 |
| Cambodia | 6,000 | | | | | 6,000 | 0.1 |
| Indonesia | 26,000 | | | | | 26,000 | 0.4 |
| Japan | 280,000 | | | | | 280,000 | 4.1 |
| Lao P.D.R. ^{1/} | 4,000 | | | | | 4,000 | 0.1 |
| Malaysia | 10,000 | | | | 889,464 | 899,464 | 13.2 |
| Myanmar | 10,000 | | | | | 10,000 | 0.1 |
| Philippines | 15,000 | | | 2,696,917 | | 2,711,917 | 39.8 |
| Singapore | 8,000 | | 0 | | | 8,000 | 0.1 |
| Thailand | 20,000 | 1,985,586 | | | | 2,005,586 | 29.4 |
| Vietnam | 14,000 | | | | | 14,000 | 0.2 |
| Sub-total | 400,000 | 1,985,586 | 0 | 2,696,917 | 889,464 | 5,971,967 | 87.6 |
| Other Sources ^{2/} | 9,329 | 189,668 | 7,629 | 636,861 | | 843,487 | 12.4 |
| Total | 409,329 | 2,175,254 | 7,629 | 3,333,778 | 889,464 | 6,815,454 | 100 |

Remarks :

1/ The Secretariat has not yet received MRC from Lao P.D.R. amounting to US\$ 4,000.

2/ Including contribution from non-member governments, international organizations/agencies and miscellaneous receipts.

Other sources of contribution received by SEAFDEC in the year 2008 (In US\$)

| Sources | Amount in US\$ ^{1/} |
|--|------------------------------|
| Fisheries Agency-Japan(TF-II) | 788,672 |
| Fisheries Agency-Japan (TF-IV) | 743,862 |
| Swedish International Development Cooperation Agency (Sida) | 141,791 |
| ASEAN Foundation | 324,686 |
| Food and Agriculture Organization of the United Nations (FAO) | 16,258 |
| United Nations Environmental Programme/ Global Environmental Facility (UNEP/GEF) | 42,202 |
| Others | 843,487 |

Remark :

1/ Other sources of contribution include funds received from non-member governments, international organizations/agencies and miscellaneous receipts.