

PROCEEDINGS VOLUME II: TECHNICAL REPORT
ASEAN-SEAFDEC CONFERENCE

on Sustainable Fisheries for Food Security in the New Millennium



"FISH FOR THE PEOPLE"

19-24 November 2001
Bangkok, Thailand

Jointly organized by:

Association of Southeast Asian Nations (ASEAN)

Southeast Asian Fisheries Development Center (SEAFDEC)

in collaboration with:

Food and Agriculture Organization of the United Nations (FAO)

and hosted by:

Department of Fisheries, Thailand (DOF)



PROCEEDINGS VOLUME II: TECHNICAL REPORT

*Including the Joint Press Release, Resolution and Plan of Action,
consolidated Conclusions and Recommendations of the Technical Session,
and Addendum to the Technical Document*

for the



ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People”



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PREPARATION AND DISTRIBUTION OF THIS DOCUMENT

The Proceedings of the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People” was prepared by the Southeast Asian Fisheries Development Center (SEAFDEC), in collaboration with the Association of Southeast Asian Nations (ASEAN), the Food and Agriculture Organization of the United Nations (FAO), and the Department of Fisheries, Thailand (DOF). The Document is distributed to participants of the Conference, the ASEAN and SEAFDEC Member Countries and all collaborative Organizations.

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PROCEEDINGS
OF THE ASEAN-SEAFDEC CONFERENCE ON SUSTAINABLE FISHERIES
FOR FOOD SECURITY IN THE NEW MILLENNIUM: “FISH FOR THE PEOPLE”

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JOINT PRESS RELEASE

AND

RESOLUTION & PLAN OF ACTION

ON SUSTAINABLE FISHERIES FOR FOOD SECURITY
FOR THE ASEAN REGION



The ASEAN-SEAFDEC Ministers during the Ministerial Session of the Conference

JOINT PRESS RELEASE

*H.E. Mr. Shucheeep Hansaward
Minister of Agriculture and Cooperatives, Thailand*

(Statement from the Chairman of the Ministerial Session)

1. His Excellency Mr. Shucheeep Hansaward, Minister of Agriculture and Cooperatives of the Kingdom of Thailand officially opened and delivered the Opening Address for the Ministers of the ASEAN-SEAFDEC Member Countries who are responsible for fisheries on the occasion of the Ministerial Session of *The ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People" (the Millennium Conference)*, in Bangkok, Thailand on 24 November, 2001. The Ministerial Session was attended by:

H.E. Mr. Idris Belaman, Permanent Secretary representing the Minister of Industry and Primary Resources, Brunei Darussalam

H.E. Mr. May Sam-Oeun, Secretary of State of Ministry of Agriculture, Forestry and Fisheries, Cambodia

H.E. Dr. Rokhmin Dahuri, Minister of Marine Affairs and Fisheries, Indonesia

H.E. Mr. Takeshi Noma, Senior Vice Minister of Agriculture, Forestry and Fisheries, Japan

H.E. Mr. Singkham Phonvisay, Senior Representative of the Government of Lao PDR

H.E. Dato' Seri Haji Mohd. Shariff b.Hj. Omar, Deputy Minister of Agriculture, Malaysia

H.E. U Aung Thein, Deputy Minister of Livestock and Fisheries, Myanmar

H.E. Mr. Cesar M. Drilon Jr., Undersecretary of Department of Agriculture, Philippines

H.E. Mr. Calvin Eu, Ambassador of Singapore in Thailand representing the Minister for National Development, Singapore

H.E. Mr. Shucheeep Hansaward, Minister of Agriculture and Cooperatives, Thailand

H.E. Dr. Ta Quang Ngoc, Minister of Fisheries, Vietnam

Honorable Dr. Azmi Mat Akhir, Director, Bureau of Functional Cooperation, the ASEAN Secretariat, and their respective delegations

2. The Ministers of the ASEAN-SEAFDEC Member Countries who are responsible for fisheries, met for the first time, under the chairmanship of H.E. Mr. Shucheeep Hansaward, Minister of Agriculture and Cooperatives, Thailand.

3. The Ministers recognized the growing demand for fish and fishery products and the need to obtain sustainable fish supplies for food security as well as the increasing pressure on ASEAN's aquatic environment and fisheries resources. The Ministers underlined the

increasing role of fisheries including aquaculture that could play in supporting food security primarily as source of animal protein, expanding job opportunities, improving the incomes of small-scale fishermen and fish-farmers families and to the better attainment of economic growth as a whole, and should be further promoted in a sustainable manner.

4. The Ministers emphasized the importance of *the Millennium Conference* and their first ministerial Meeting in opening up the new venues for dialogue on fisheries issues at the ASEAN-SEAFDEC ministerial level with the aim to promoting and enhancing cooperation in the region for food security and the livelihoods and well-being of the ASEAN people.

5. The Conference theme is “Sustainable Fisheries for Food Security”, and this reflects the ASEAN Vision 2020 of “*sustainable and equitable growth ... in an ASEAN where hunger, malnutrition, deprivation and poverty are no longer basic problems*”. The Conference also draws on the Hanoi Plan of Action to “*enhance food security and global competitiveness of ASEAN’s food products*”, while “*protecting the environment and promoting sustainable development*”.

6. During the Conference, problems of fisheries resource decline were discussed and analyzed to formulate harmonized regional policies to achieve the goal of sustainable fisheries production. The Technical Session of the Conference dealt on issues related with fisheries management, aquaculture and utilization of fish and fishery products focusing on the unique context and nature of the region’s fisheries in interpreting global fisheries issues and identifying appropriate regional responses.

7. Preceded and reported by the ASEAN-SEAFDEC Senior Official Meeting, held on 22 November 2001, and the Technical Session, held for five days on 19- 23 November 2001, the Ministers considered the outcomes of the two meetings which were used as a basis for the development of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region.

8. Having considered the conclusions and technical recommendations, deliberated through series of national and regional participatory processes in preparation for *the Millennium Conference*, together as a result of the deliberations in the Ministerial Session on 24 November 2001, the Ministers agreed to adopt a ***Resolution on Sustainable Fisheries for Food Security for the ASEAN Region***, for implementation, through individual and collective efforts, among ASEAN-SEAFDEC Member Countries to promote sustainable fisheries in the region.

9. The Ministers calls for due attentions and collaborations of all concerned parties to give full effect to the Resolution, and tasked the ASEAN-SEAFDEC Senior Officials to proceed with the implementation of the ***Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region***, adopted on 24 November 2001, in Bangkok, Thailand, as a guideline for formulating and implementing programs, projects, and activities through appropriate ASEAN-SEAFDEC mechanisms.

10. The Ministers expressed appreciation to Japan for her continuing support for the fishery development in the region. Since the establishment of SEAFDEC in 1967, Japan has been closely involved with the fishery development in the region and has provided generous support and technical expertise for all its Members.

11. The Ministers recognized the importance of this event and commended the collaboration between ASEAN and SEAFDEC for the success of the Conference. The importance of collaboration between ASEAN and SEAFDEC has long been realized by the AMAF, and the initiative to organize this Conference arose during the 2nd Meeting of the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) to ensure sustainable fisheries production and promote collaboration on the global initiatives.

12. The Ministers expressed appreciation to the support and assistance given by the various international and regional organizations including the Food and Agriculture Organization of the United Nations (FAO), as well as the technical experts from within and outside the region who have conducted series of preparatory work leading to this successful *Millennium Conference*. Special thanks were extended to the ASEAN Foundation who is a major financial support for the organization of this event.

13. The delegations of Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Viet Nam, and the ASEAN Secretariat expressed their appreciation to the Government and the people of Thailand, especially the Department of Fisheries of Thailand for the warm hospitality accorded them and the excellent arrangements made for the Meeting.

Attachment:

The adopted 'Resolution on Sustainable Fisheries for Food Security for the ASEAN Region'

**RESOLUTION ON SUSTAINABLE FISHERIES FOR
FOOD SECURITY FOR THE ASEAN REGION**

We, the Ministers of ASEAN-SEAFDEC Member Countries who are responsible for fisheries, met in Bangkok, Thailand on the occasion of *The ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People”*, on 24 November, 2001,

Recalling the principles of the ASEAN Vision 2020 and the initiatives agreed upon by the ASEAN Member Countries under the Hanoi Plan of Action;

Recognizing the importance of sustainable fisheries for food security and the livelihoods and well-being of the ASEAN people;

Noting the provisions of international declarations and instruments on food security, fisheries, ocean governance, trade, and the aquatic environment;

Conscious of the growing demand for fish and fishery products and the need to secure sustainable fish supply for food security for each ASEAN Member Country;

Aware of the increasing pressures on ASEAN’s aquatic environment and fisheries resources from fisheries and non-fisheries activities, that may negatively impact on the livelihoods of the ASEAN people, in particular the poor and disadvantaged segments of society;

Considering the benefits of current and future fisheries cooperation among ASEAN-SEAFDEC Member Countries to promote sustainable fisheries in ASEAN Member Countries; and,

Deciding that the issues identified through the national and regional participatory processes in preparation for the above Conference and those identified at the Conference should be given priority;

DO HEREBY RESOLVE, without prejudice to the sovereign rights, obligations, and responsibilities of our countries under relevant international laws and arrangements, to:

1. Formulate regional guidelines to implement the Code of Conduct for Responsible Fisheries, taking into account the specific social, economic, cultural, ecological and institutional contexts and diversity of ASEAN fisheries;
2. Cooperate to identify constraints and enhance collaboration among government agencies, which have responsibility for fisheries and fisheries-related issues, in order to harmonize policies, plans and activities which support sustainable fisheries at the national and regional levels;
3. Acknowledge the need for enhanced human resource capabilities at all levels and encourage greater involvement by stakeholders to facilitate consensus and compliance in achieving sustainable fisheries;
4. Mobilize regional technical cooperation to reduce disparities and promote solidarity among ASEAN Member Countries;
5. Encourage effective management of fisheries through delegation of selected management functions to the local level;
6. Recognize the need to progressively replace “open access” to fisheries resources with “limited access regimes” through the introduction of rights-based fisheries which may

also facilitate the management of fishing capacity and promote the use of responsible fishing gears and practices;

7. Strengthen national fishery statistical systems and maximize their use for fisheries planning and management and develop standard definitions and classifications to facilitate regional fishery statistics and information exchanges;
8. Emphasize the importance of inland fisheries and aquaculture in planning and policy formulation to improve food security and the livelihoods of rural people;
9. Work towards the conservation and rehabilitation of aquatic habitats essential to enhancing fisheries resources;
10. Mitigate the potential impacts on the environment and biodiversity, including the spreading of aquatic animal diseases, caused by the uncontrolled introduction and transfer of non-indigenous and exotic aquatic species;
11. Promote the maximum utilization of catch, including the reduction of discards and post-harvest losses to increase fish supply and improve economic returns;
12. Increase aquaculture production in a sustainable and environment-friendly manner by ensuring a stable supply of quality seeds and feeds, effectively controlling disease, promoting good farm management and transferring appropriate technology;
13. Promote aquaculture for rural development, which is compatible with the rational use of land and water resources, to increase fish supply and improve the livelihoods of rural people;
14. Improve post-harvest technologies to ensure fish quality assurance and safety management systems, which are appropriate for small and medium-sized enterprises in the region, taking into account the importance of traditional fish products and food security requirements;
15. Strengthen the joint ASEAN approaches and positions on international trade in fish and fishery products indigenous to the region by harmonizing standards, criteria and guidelines; and
16. Increase the participation and involvement of ASEAN Member Countries in international fora to safeguard and promote ASEAN interests;

AND DO HEREBY DECIDE,

That the Resolution be implemented as soon as possible and use the *Plan of Action* adopted by the ASEAN-SEAFDEC Senior Officials as a result of the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People”, held November 19-24, 2001, in Bangkok, Thailand, as a guideline for formulating and implementing programs, projects, and activities through appropriate ASEAN-SEAFDEC mechanisms.

PLAN OF ACTION ON SUSTAINABLE FISHERIES FOR FOOD SECURITY FOR THE ASEAN REGION

On the occasion of the *ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People"*, the Senior Officials of ASEAN-SEAFDEC Member Countries met in Bangkok, Thailand on 24 November 2001.

Guided by the Resolution on Sustainable Fisheries for Food Security for the ASEAN Region, and the need to formulate regional guidelines for the Code of Conduct for Responsible Fisheries, the Senior Officials adopted the following Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region to be used as a guideline to develop programs, projects and activities for the implementation of the Resolution.

A. FISHERIES MANAGEMENT

1. Establish and implement comprehensive policies for innovative fisheries management, such as the decentralization of selected fisheries management functions to the local level, the progressive introduction of rights-based fisheries management through licensing and community fishing rights, the improvement of vessel registration systems and the development of supporting legal and institutional frameworks.
2. Ensure local consensus building on innovative management measures through consultative processes and create close monitoring mechanisms to support and implement these measures.
3. Take measures to prevent unauthorized fishing and eliminate the use of illegal and destructive fishing gears and practices by building awareness of their adverse impacts, the development and promotion of responsible and selective fishing gears and practices, enforcing regulations and encouraging alternative means of livelihood.
4. Optimize the use of inshore waters through resource enhancement programs such as promoting the installation of artificial reefs and structures, encouraging coordinated and effective planning for coastal fisheries management programs, undertaking environmental impact assessment studies, restocking of commercially important fish species and developing human resources for the implementation of such programs.
5. Review the issue of excess fishing capacity at the national level and recommend where appropriate, measures to improve the registration of fishing vessels, the introduction of rights-based fisheries and the reduction in the number of fishing boats and level of fishing effort using government incentives.
6. Formulate guidelines to promote the use of practical and simple indicators for multi-species fisheries as a substitute for classical fisheries management models within the national fisheries management framework, with particular regard to facilitating timely local level fisheries management decisions.
7. Investigate the potential of under-utilized fisheries resources and promote their exploitation in a precautionary manner based upon analysis of the best available scientific information under rights-based fisheries regimes.
8. Develop and maintain freshwater fisheries through inter-agency coordination of multiple-use water resources and trans-boundary inland fisheries management, promoting awareness of the importance of freshwater fisheries for local food security, rehabilitating and restoring habitats for migratory freshwater fish, restocking indigenous fish species to

enhance productivity and encouraging culture-based freshwater fisheries where appropriate.

9. Coordinate and decentralize the collection and use of fisheries related statistical data between the national fisheries and other authorities including those responsible for food security, trade, vessel registration, aquaculture and rural development.
10. Maximize the use of national fisheries statistical systems by focusing on clear objectives and timely results directly related to fishery management decision-making and planning processes.
11. Apply, where appropriate, regionally standardized definitions and classifications for statistical data to facilitate regional compilation, analysis and data exchange.
12. Develop national statistical mechanisms on inland fisheries and aquaculture in order to provide a basis for their development and the exchange of statistical data and related information, with particular emphasis on the catchment approach in international river basins.

B. AQUACULTURE

1. Ensure that national policies and regulatory frameworks on aquaculture development are directed toward sustainability and avoidance of conflicts by incorporating consultations with stakeholder groups, implementing aquaculture zoning, considering social and environmental impact, and also regulating rights of access to, and use of, open water sites for mariculture.
2. Ensure production of high quality seeds on a consistent and sustainable basis by providing government support for public and private hatchery development and research, developing domesticated broodstocks and fish reproductive technologies, and promoting responsible collection and use of wild broodstock and seed.
3. Promote good farm management practices that reduce effluent pollution load and comply with relevant effluent standards through appropriate treatment.
4. Reduce the risks of negative environmental impacts, loss of biodiversity, and disease transfer by regulating the introduction and transfer of aquatic organisms in accordance with the Regional Guidelines on the Responsible Movement of Live Aquatic Animals and Plants.
5. Improve the efficient use of aquatic feeds by regulating the quality of manufactured feed and feed ingredients, providing guidelines on farm-level food conversion ratios and levels of aquaculture effluents, and supporting research into developing suitable alternative protein sources to reduce dependence on fish meal and other fish based products.
6. Improve capabilities in the diagnosis and control of fish diseases within the region by developing technology and techniques for disease identification, reliable field-side diagnostics and harmonized diagnostic procedures, and establishing regional and inter-regional referral systems, including designation of reference laboratories and timely access to disease control experts within the region.
7. Formulate guidelines for the use of chemicals in aquaculture, establish quality standards and take measures to reduce or eliminate the use of harmful chemicals.

8. Build human resource capabilities for environment-friendly, healthy, wholesome and sustainable aquaculture through closer public and private sector collaboration in research and development, paying particular attention to the emerging need for skills in biotechnology, and effectively implementing aquaculture education and extension services.
9. Promote aquaculture as an integrated rural development activity within multiple-use of land and water resources available through inter-agency coordination in policy formulation, project planning and implementation, stakeholder consultation, extension services and technology transfer.

C. SUSTAINABLE UTILIZATION OF FISH AND FISHERY PRODUCTS

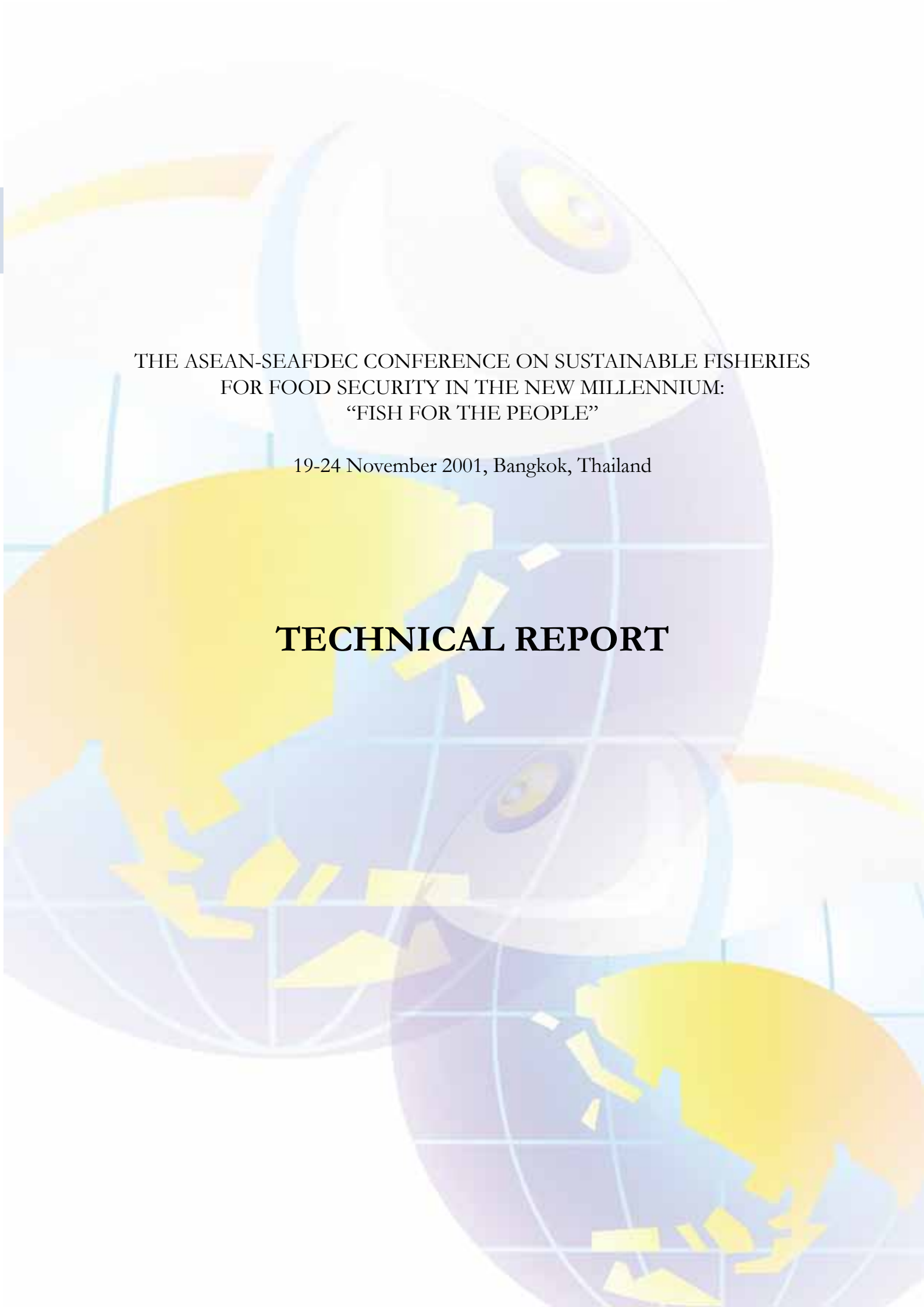
1. Introduce and provide support for the development of technologies to optimize the utilization of catch and reduce post-harvest losses, wastes and discards in industrial and small-scale fisheries and processing operations through improved processing facilities, on-board and on-shore handling, storage and distribution of fish and fishery products.
2. Promote the production and preserve the diversity of traditional fish products by assisting producers to secure stable supplies of quality raw materials, to meet food safety requirements and to improve product identity, nutritive value and marketing.
3. Encourage relevant control agencies to coordinate their activities at all levels in applying appropriate legislation regarding the quality and safety of fish and fishery products.
4. Develop and apply fish quality and safety management systems that ensure food safety and support the competitive position of ASEAN fish products on world markets through the implementation, validation and verification of Hazard Analysis and Critical Control Point (HACCP) based systems and improved laboratory practices, and adapting quality and safety management systems so that they may be applied to small and medium enterprises in the ASEAN region.
5. Promote and conduct training programs to upgrade the technical skills and competencies of personnel in the public sector and the fish processing industry in the ASEAN region.

D. FISH TRADE

1. Strengthen ASEAN trade policy on fish and fishery products through regional collaboration by harmonizing product standards and sanitary measures with international standards wherever appropriate, working towards harmonized guidelines for fish inspection and quality control systems among ASEAN Member Countries, strengthening fish inspection and quality control systems with regard to food safety and exchanging information on risk analysis.
2. In collaboration with international technical organizations such as the Food and Agriculture Organization of the United Nations (FAO) and the World Trade Organization (WTO), assess the impact of government subsidies on fisheries, particularly on the needs of small-scale fisheries in the ASEAN region and sustainable fisheries.
3. Anticipate and address the potential impacts of eco-labelling of ASEAN fish and fishery products.

E. REGIONAL AND INTERNATIONAL POLICY FORMULATION

1. Enhance regional collaboration by developing guidelines, criteria and standards on important fisheries issues to strengthen ASEAN policies and positions and harmonize them with international initiatives and arrangements.
2. Increase participation and involvement of ASEAN Member Countries in international fora and technical committees such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Codex, FAO, Office International des Epizooties (OIE), Regional Fisheries Bodies, and WTO to safeguard and promote ASEAN interests, recognizing that international fisheries policies are increasingly discussed and agreed upon at the global level.



THE ASEAN-SEAFDEC CONFERENCE ON SUSTAINABLE FISHERIES
FOR FOOD SECURITY IN THE NEW MILLENNIUM:
“FISH FOR THE PEOPLE”

19-24 November 2001, Bangkok, Thailand

TECHNICAL REPORT

TECHNICAL REPORT

INTRODUCTION

The Technical Report of the Conference contains the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region and the Conclusions and Recommendations of the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People”, held on 19-24 November, 2001, in Bangkok, Thailand. It also provides a record of the presentations made during the Plenary 2 Session on Fisheries Cooperation (Annex 1), and an acknowledgement of the efforts of those who contributed to the Technical Sessions (Annex 2).

The Resolution on Sustainable Fisheries for Food Security for the ASEAN Region is a sixteen point resolution prepared for adoption by the Ministers responsible for fisheries from the ASEAN/SEAFDEC Member Countries. The Resolution provides the *regional policy framework* for achieving sustainable fisheries.

The Plan of Action on Sustainable Fisheries For Food Security For The ASEAN Region is a five part plan of action covering Fisheries Management, Aquaculture, Sustainable Utilization of Fish and Fishery Products, Fish Trade, and Regional and International Policy Formulation. The plan was approved by the Senior Officials of the ASEAN-SEAFDEC fisheries-related agencies. It identifies thirty-one *priority actions* for achieving sustainable fisheries.

The **Conclusions and Recommendations** of the two Plenary Sessions and the four Technical Panel Sessions have been compiled from **two** sources – the Technical Document (see below), which was prepared **before** the Conference, and the Conclusions and Recommendations prepared as a result of the discussions held **during** the Technical Sessions of the Conference. The latter sets of Conclusions and Recommendations are cited as an ‘Addendum’ to each set of Conclusions and Recommendations which has been extracted from the Technical Document. Each addendum places a particular emphasis on conclusions and recommendations that **have not already** been identified in the Technical Document.

The Technical Report of the Conference contained in this Volume II provides an opportunity to present the views of conference participants, including representatives from the ASEAN/SEAFDEC member countries, representatives from international organizations, and other fisheries experts who attended the conference from Southeast Asia and around the world. It is intended that the Technical Report be used in association with the Technical Document, both of which will be an important *general technical guideline* for countries to use when implementing the Plan of Action. For this reason much of the technical matter of the Proceedings has been placed in a separate Volume II.

The **Technical Document** for the **ASEAN/SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People”** contains the full texts of presentations made at the conference and conclusions and recommendations for the three conference topics – Fisheries Management, Aquaculture, and Sustainable Utilization of Fish and Fishery Products. The Technical Document was prepared for the Conference over a two-year period. It reflects the views expressed by hundreds of participants who attended 10 regional technical consultations and 10 national seminars which were held for the purpose of

developing the technical program for the Millennium conference. The Technical Document is an important *general technical guideline* for countries to use when implementing the Plan of Action.

EXECUTIVE SUMMARY

The technical sessions of the Conference were based on a collaborative process between ASEAN Member Countries over the previous two years. The Resolution and Plan of Action and the Technical Document were the result of a series of National and Regional Consultations and Seminars and meetings of Senior Officials organized with a view to achieving sustainable fisheries and increasing supplies of fish and fishery products in the ASEAN region.

The specific objectives of the Conference were achieved, namely:

1. To discuss and analyze issues critical to the achievement of sustainable fisheries, recognizing its importance to food security for the ASEAN region;
2. To create a climate of cooperative and integrated efforts among ASEAN Member Countries to achieve sustainable fisheries;
3. To emphasize the importance of such efforts in dealing with socio-economic issues, especially for the disadvantaged people of the region; and
4. To formulate appropriate regional fisheries policy and identify and prioritize implementable actions by the fisheries sectors in the ASEAN region.

The Plenary 1 session examined the global and regional outlook for fish supply and demand. In response to economic and population growth, global supply and demand has continued to increase during the past decade. ASEAN produces about 12% of global fish production, and fish plays an important role in the ASEAN region, as a food item, as a foreign exchange earner, and for employment creation and income generation. Future growth in demand for fish in ASEAN is likely to outpace future supply, in particular supplies produced by Member Countries. This projected gap between supply and demand implies a reduction in food security, which may impact, in particular, on the poor and less advantaged in society. A range of other impacts can be foreseen on approximately 12 million workers in ASEAN’s fisheries, which are worth over US\$12 billion to ASEAN economies. Urgent action is needed to ensure that the production from the region’s fisheries resources will continue to contribute to food supplies and food security, to sustain employment and incomes for the population, and to contribute to trade and earn foreign exchange. Three key topics requiring attention were identified: sustainable fisheries management, sustainable aquaculture, and sustainable utilization of fish and fishery products.

Four concurrent Technical Panel Sessions were held on these three key topics. Two Technical Panels examined issues related to Sustainable Fisheries Management under nine different sub-topics. Six sub-topics were discussed in the Technical Panel on Sustainable Aquaculture, and a further six sub-topics, which included issues of fish quality and trade, were addressed the Technical Panel on Sustainable Utilization of Fish and Fishery Products.

The Conclusion and Recommendations resulting from the discussions of each sub-topic were summarized by the chairman of each panel, with the assistance of his fellow panelists. These Conclusions and Recommendations were presented in the form of an ‘Addendum’ to the principal Conclusions and Recommendations contained in the Technical Document. The

purpose of the addendum is to clarify, amplify, and amend the content of the original Technical Document.

In the Plenary 2 session on Fisheries Cooperation Policies in the ASEAN Region the participating organizations presented their policies and programs, emphasizing the importance of fisheries in the region and their willingness to collaborate in the follow-up to the Conference.

The technical outcomes of the Conference process, namely: the Resolution and Plan of Action, the Technical Report, the Technical Document, and the reports of the preparatory steps, including the reports of the National Seminars and Regional Technical Consultations, form a comprehensive record of the entire technical dimension of the Conference process. They serve as a guideline for ASEAN Member Countries in formulation of national and regional fisheries policy to build sustainable fisheries and increase supplies of fish and fishery products and lay a foundation for preparation of a program of actions to meet the specific requirements of the region and to give effect to the regional policy. The outcomes also offer guidance on mobilizing an appropriate regional collaborative mechanism to effectively implement regional plans and programs of action, and foster more active participation in international fora in order that ASEAN concerns are incorporated into global instruments.

PLENARY 1: OUTLOOK OF FISH SUPPLY AND DEMAND AT GLOBAL LEVEL AND IN THE ASEAN REGION

There is a growing gap between supply and demand for fish at a global level and in the ASEAN region. This gap is likely to increase as a result of economic and population growth, and depletion of living aquatic resources and their habitats. Reduced availability of fish will tend to undermine food security, income generation, employment and fish trade. An increase fish production to meet the growing demand requires a broad range of initiatives in three key areas: sustainable fisheries management, sustainable aquaculture, and sustainable utilization of fish and fishery products. These three topics are the subjects of the Technical Panel Sessions (see below).

Addendum

Conclusion

The analyses were recognized as an excellent contribution to the region's understanding of supply and demand for fish at an aggregate level and as a framework for addressing the issue of increasing supply to meet the future demand. The wide diversity of ASEAN Member Countries and the influence of social and economic factors on demand were noted. Attention was drawn to the importance of also focusing such analyses at the household level with a view to improving local food security. It was recognized that fisheries make an important contribution to food security, not only through increased food supply but also indirectly through increased incomes.

Recommendations

Supplementary to the recommendations made in the technical document the following recommendations were made:

- a) In addition to the analysis of national food security, consider analyses of household food security;*

- b) *Consider preparation of similar analyses of fish supply and demand at national level based on the national food security policy and further consideration of social, economic and demographic factors; and*
- c) *Identify, and where possible systematically collect, baseline data essential to analyses of fish supply and demand.*

PANEL 1: SUSTAINABLE FISHERIES MANAGEMENT I

1.1 Decentralization of Fisheries Management

Conclusion

While a highly centralized fisheries management system has merit for the control of industrial fisheries, it has great difficulty in responding to the needs of the great variety of small-scale fisheries management situations and problems. A decentralized management mechanism involving appropriate local institutions, co-management mechanisms and involvement of the local communities has demonstrated success in several ASEAN Member Countries. Such a decentralization process must create an appropriate legal and institutional framework, coordinate activities with other local government institutions and promote the constructive involvement of the fishers and their communities.

Recommendations

Based on the above conclusion, the following recommendations are suggested.

- I. Investigate and examine the feasibility and viability of the policy on decentralization of fisheries management authority, responsibility and function to appropriate local government institutions for industrial fisheries and small-scale/coastal fisheries sub-sectors:
 - a) Formulate appropriate national policy on decentralization of fisheries management in collaboration with relevant agencies;
 - b) Determine the types of fisheries management authority, responsibility and function that can be delegated and shared with local institutions;
 - c) Determine the appropriate local institutions that can be authorized and can accept the mandate to manage the fisheries in their area of jurisdiction;
 - d) Determine the need for human resources development to prepare the local resource users and their community to assume greater responsibility for managing the fisheries in their local area; and
 - e) Develop local consensus through greater coordination among the different agencies involved that have responsibility in fisheries and coastal resources management.
- II. Prepare a comprehensive fisheries management program under the above decentralization policy to further clarify various issues, including detailed Terms of Reference for both central government and local institutions in fisheries management and human resources development.
- III. Clarify and provide appropriate legal framework, mandate and responsibility to the different fisheries management authorities at both the central and local levels in the management for both sub-sectors.
- IV. Conduct a step-by-step development plan of fisheries management decentralization, especially in the gradual transfer of selected management authority, responsibility and function to the local governments and non-government institutions where greater coordination and cooperation between the central and local institutions are required with the full support of the central government offices.

Addendum

Conclusion

The concept of decentralization was strongly supported as a tool for sustainable fisheries management, both in terms of devolution of the roles and responsibilities of fisheries administration to a local level and promotion of the active participation of stakeholders. Decentralization was seen as a learning process requiring careful choices between a broad spectrum of approaches, which are complementary to and do not replace centralized management. Pilot projects and a review of experiences in the region can assist this choice of approaches, and within a broader national framework, help the patient construction of a cost-effective legal and administrative framework to accommodate the specific needs of each local fishery. Poor awareness and weak incentives for participation by stakeholders are substantial constraints. They result, in part, from a lack of human resources and financial capacity in local fisheries administrations and among stakeholders. Clear definition, or characterization of the management units, strong stakeholder organizations with active and broad-based participation, existence of traditional management regimes, and moderate levels of resource exploitation are important factors contributing to successful decentralization of fisheries management.

Recommendations

The recommendations made in the Technical Document were endorsed with the following additions:

- a) Study the costs, benefits, advantages, and problems of building and supporting existing decentralized fishery regimes in the region with a view to learning the lessons of these experiences; and*
- b) Take measures to carefully define the management units to be the subject of the decentralized fishery management through mapping and delineation of the geographical, social, or other boundaries of the fishery.*

1.2 Rights-based Fisheries

Conclusion

ASEAN Member Countries should introduce appropriate rights-based fisheries regimes in place of open access regimes. Larger industrial fisheries may be regulated through improved vessel registration and licensing systems. Co-management mechanisms and granting of exclusive fishing rights to community-based institutions may also be promoted for small-scale and coastal fisheries under a decentralized fisheries management system.

Recommendations

- I. Gradually replace the “Open Access Regime” with “Rights-Based Fisheries” under an input control management system.
- II. Formulate appropriate policy and fisheries management frameworks for both industrial and small-scale/coastal fisheries respectively.
- III. Prepare appropriate guidelines to promote rights-based fisheries for both industrial fisheries and small-scale/coastal fisheries.
- IV. Coordinate among the relevant agencies to gradually implement rights-based fisheries regimes.
- V. Investigate appropriate legal framework and provision for the implementation of these rights-based fisheries.
- VI. For industrial fisheries using larger industrial vessels:

- a) Regulate those fisheries operating outside inshore waters, including industrial fisheries with an appropriate licensing system.
- b) Improve the national vessel registration system in collaboration with responsible agencies and accommodate requirements of licensing into the existing registration system.

VII. For small-scale/coastal fisheries:

- a) Investigate the most appropriate mechanism to establish self-regulatory fisheries management systems, taking into account the various local factors.
- b) Identify the most appropriate system of fishing rights (user-right) and try them out through pilot projects to verify the effectiveness in the local situation.
- c) Study the most appropriate community-based institutions and evaluate the feasibility to delegate the management responsibilities and grant appropriate rights.
- d) Develop human resource capacity through government support in order for these community-based institutions to take up additional responsibilities.

Addendum

Conclusion

There was general support for the conclusion and recommendations on rights-based fisheries in the Technical Document. The introduction of rights-based fisheries will be a key approach to managing fisheries resources sustainably and achieving food security in the ASEAN region. The decentralization of fisheries management is an important complementary activity for successful implementation of rights-based fishing. It is important to clearly define the fishing rights with regard to duration, transferability and exclusivity. In order to effectively define and allocate fishing rights, rights-based fisheries management regimes must be based on accurate information on the fishery, including data on the number of vessels, the number and types of gears being used, the fishing capacity of the vessels, and the size and health of the resource. To generate support and acceptance for rights-based fishing regimes, especially at the local level, it will be important to enlist the support of community leaders and key organizations even if they are not directly involved in the implementation of the new system. Rights-based fishing regimes should be introduced gradually, especially in poor, fishery-dependent communities in order to minimize the negative impacts and allow time for adjustment. Sourcing of funds for the introduction and maintenance of fishing rights requires further attention.

Recommendations

The recommendations in the Technical Document were endorsed with the following additions:

- a) *Define the duration, transferability and exclusivity of fishing rights in a clear manner; and*
- b) *Examine alternatives for funding the introduction and maintenance of rights-based fishing regimes.*

1.3 Resource Enhancement

Conclusion

Considering current levels of degradation of aquatic environments within the ASEAN region, it is projected that the productivity of fisheries will decline. This in turn will lead to a reduced supply of fish and hence its level of contribution to local food security. Various strategies to enhance the resource base can be initiated by the countries in the region. Coastal areas,

specifically the inshore waters, are highly important to the replenishment of aquatic resources. They provide critical habitat for spawning and nurseries for many species, particularly a large number of commercially important fish species. Government resource enhancement efforts should focus on: 1) integrated installation of artificial habitats in inshore waters with careful pre-assessment of environmental and socio-economic impact; 2) Re-stocking exercises with careful assessment of economic feasibility and environmental impact; 3) the establishment of Marine Parks to protect fragile ecosystems; and 4) develop management practices to effect seasonal closures of spawning areas in accordance with management requirements.

Recommendations

In order to enhance the fisheries resources the following recommendations are made:

- I. Take measures to restore critical inshore habitats, which have been extensively degraded by various human activities.
- II. Assess the feasibility and environmental impact of artificial reefs and other man-made structures in inshore waters with respect to resource enhancement and coastal zone management objectives.
- III. Promote re-stocking activities (seed release programs) from hatchery-produced stocks and/or wild collected sources in areas where they are considered to be feasible, particular localities operating within a regime of rights-based fisheries.
- IV. Further encourage a culture-based fisheries program in inland waters where favourable exploitation patterns and traditional management mechanisms prevail.
- V. Enhance marine engineering capabilities to address the physical constraints in the construction, installation and placement of resource enhancement structures.
- VI. Note that the implementation of rights-based fisheries, more specifically exclusive fishing rights, and the enhancement of inshore habitat by expanded ARs are prerequisites for the successful implementation of a re-stocking program.
- VII. Conduct research on the released species' potential recapture rate and impact on the ecosystem.
- VIII. Ensure optimal recapture of the released stock through effective management measures, including predator control.
- IX. Develop marine parks in limited areas such as coral reefs to protect fragile coastal ecosystems, given that the establishment of marine protected areas is not feasible in the region due to their negative social impacts and enforcement problems.
- X. Promote the seasonal closure of specific areas to protect spawners and juveniles of certain commercial-valued species under rights-based fisheries management, as an alternative measure to marine protected areas.

Addendum

Conclusion

Immediate action is required to prevent further loss of habitat and damage to fish stocks. A range of effective community-level mechanisms need to be developed to assist fishers to restore habitats and rebuild stocks. These mechanisms are likely to be specific to different stocks and habitats. In this regard, habitat creation, establishment of artificial reefs, use of fish attraction devices and predator removal all have potential in the region. Restocking programs can build upon the existing aquaculture expertise in the region and would require additional research and monitoring of the effectiveness of the restocking program. Restocking may work best with sedentary species over which local fishing rights can be established. Despite some potential negative social impacts, marine protected areas (MPAs) and seasonal closures to protect spawning and juvenile stocks may be a very useful approach to resource

enhancement and restoration if the approach is derived from the concerned communities. In particular, successful MPAs can prevent further habitat degradation and loss of biodiversity and enhance commercial fish populations outside the protected area.

Recommendations

The recommendations in the Technical Document were supported with the following additions:

- a) Take immediate actions to prevent the loss of critical habitat and biodiversity in the aquatic environment;*
- b) Consider the establishment of marine protected areas in selected areas if they are taken by bottom up approach through full consultation with concerned community;*
- c) Ensure the active participation of fishers and coastal communities in the planning and execution of enhancement programs; and*
- d) Consider the establishment of a network of regional expertise on resource enhancement.*

1.4 Responsible Fishing Technologies and Practices

Conclusion

To preserve the aquatic environment and ensure the long-term sustainability of fisheries resources in the region, responsible fishing technologies and practices must be introduced. Responsible fishing plays a vital role in ensuring the effective utilization of fisheries resources and the maintenance of food security and poverty alleviation. As key stakeholders, fishers must be empowered to assume greater responsibility and oversee the use and operation of responsible fishing technologies and practices, and to have greater involvement in the implementation of appropriate fishing policies and programs.

Fisheries regulations and laws need to be effectively enforced and reviewed regularly, and regional collaboration to ensure sustainable fisheries production through responsible fisheries practices should be encouraged. The introduction of rights-based fisheries management both for industrial fisheries and small-scale/coastal fisheries may aid elimination of destructive and illegal fishing methods and overcome the problem of enforcement.

Recommendations

- I. Promote and implement responsible fishing technologies and practices by ASEAN Member Countries to ensure the sustainable exploitation of fisheries now and in the future, and to maintain food and livelihood security in the region. This will be largely achieved by:
 - a) Elimination of illegal and destructive fishing gears and practices;
 - b) Promotion and use of selective and environment-friendly fishing gears and practices; and
 - c) Introduction of appropriate rights-based fisheries management.
- II. Implement the “Regional Guidelines for Responsible Fishing Operations in Southeast Asia”, particularly those related to the use of illegal and destructive fishing gears and practices.
- III. Promote awareness of the negative impacts of illegal and destructive fishing gears and practices, including non-selective fishing gears.
- IV. Strengthen regional collaboration on the development and introduction of selective fishing gears, including various types of selectivity devices.

V. Effectively enforce laws and regulations that support the promotion of responsible fishing technologies and practices, involving all stakeholders to promote greater compliance through rights-based fisheries.

VI. Provide appropriate government supports, including the creation of alternate work opportunities for fishers who cannot find appropriate livelihood other than continuing to use such unsustainable fishing gear and practices.

VII. Prioritize research programs on strategies and approaches on fishing gear selectivity, including selectivity devices, as a component of a comprehensive management regime for the implementation of conservation and management measures by ASEAN Member Countries.

Addendum

Conclusion

There was widespread support for the content and recommendations of the Technical Document, although some new issues were raised and discussed. The need for greater clarification and understanding of fisheries terminology, definitions and related concepts was highlighted to assist in the analysis of the impacts of various fishing practices. Further technological study, research and development is needed to promote responsible fishing technologies and practices and to avoid more drastic approaches such as the banning of fishing gear or closure of fisheries. A case was made for greater collaboration and partnerships between various stakeholders (including fishermen) within a country, and for global and regional co-operative research programmes and information networks on responsible fishing technologies and practices.

Recommendations

Supplementary to the recommendations of the Technical Document, the following recommendations were noted for the purpose of clarifying and strengthening the Technical Document and promoting responsible fishing technologies and practices:

- a) Assess and evaluate the impacts of fishing to facilitate the decision-making processes of all stakeholders;*
- b) Define more clearly the terminology and concepts used in fishing, in particular to facilitate and clarify the debate over whether it is the fishing gear or the fishing practice that is responsible for negative environmental impacts;*
- c) Give greater consideration to area or seasonal closures that limit the use of particular fishing practices and conserve fish resources and habitats;*
- d) Develop long-term programs to further improve fishing gear selectivity and reduce environmental impacts, using a step-by-step approach and including assessment, implementation, monitoring, and extension phases;*
- e) Seek greater collaboration with fishermen, including the development and use of extension programs, to assist in the application and development of responsible fishing technologies and practices, in monitoring of impacts and in compliance with regulations; and*
- f) Foster networking, partnerships, and collaboration to transfer knowledge of responsible fishing technologies and practices both regionally and globally.*

1.5 Inland Fisheries Development and Management

Conclusion

Inland capture fisheries play an important role in the socio-economy of the countries in Southeast Asia, especially in the context of food security for the more depressed communities

in the hinterland areas. Fisheries administrators often find it difficult to defend the interests of the fisheries, as their contribution to income and food supply has not been well documented and made known to policy-makers. The resultant lack of attention to the sector is a major threat to its sustainability. Southeast Asia, with its relatively large and still increasing population, needs to conserve inland capture fisheries as an important source of food.

Recommendations

This can be achieved by pursuing the following:

- I. Improve the collection of statistical data on inland capture fisheries, covering all major ecosystems, catchments, types, sizes and importance of the fisheries at species level for planning and development purposes.
- II. Check and reverse degradation of the environment and loss of fisheries habitats by employing rehabilitation and mitigation measures to improve ecological conditions by:
 - a) Securing the migration routes and spawning areas for the commercially important species under either national or regional efforts.
 - b) Reducing negative impacts caused by human activities, and
 - c) Integrating inland fishery management within the multi-purpose use framework of water resources.
- III. Restock inland waters to increase production with due caution regarding the risks to the environment and biodiversity.
- IV. Use a more pragmatic management regime involving the fishing communities, industry and other stakeholders in place of conventional command and control measures to prevent over-exploitation of fisheries resources.
- V. Promote regional cooperation and management of inland fishery resources in places where the issues are transboundary in nature, such as the Mekong River Basin.

Addendum

Conclusion

The inland capture fisheries sector is not only important in the context of food security but also for improving the livelihood of rural communities by providing other economic opportunities such as recreational fisheries, supply of ornamental fish and use of inland water bodies for aquaculture. This makes it a very diverse and complex sector with a multitude of activities, which require a multi-prong approach to address the issues of the sector in an integrated manner. The need to improve inland fisheries planning, prioritize actions and strengthen government institutions in charge of inland fisheries management was also underlined.

Recommendations

The recommendations in the Technical Document were endorsed with the following additions:

- a) *Encourage gathering of knowledge and information through research studies and other cost-effective and innovative methods such as involving the local community;*
- b) *Employ a river basin approach to the collection and analysis of statistical data;*
- c) *Use decentralization as a tool for management of inland fisheries;*
- d) *Conduct appropriate surveys prior to stocking inland waters and take measures to monitor and evaluate the impact and contribution of stocking;*
- e) *Establish measures to conserve both commercial and non-commercial aquatic food fish species;*

- f) *Establish a collaborative research and development program involving national, regional and international organizations to address the complexities involved in the equitable allocation of water resources for multipurpose utilization; and*
- g) *Develop approaches to fisher participation which recognize that fishing is predominantly undertaken on a part-time basis as but one component of rural livelihood.*

PANEL 2: SUSTAINABLE FISHERIES MANAGEMENT II

2.1. Harvesting of Under-Exploited Resources

Conclusion

Surveys and limited experimental fishing have been suggested for identification of the potential of new fisheries and expansion of fisheries based on under-exploited resources within the ASEAN region and adjacent seas. These resources can contribute to food security and economic development in the region. An effective rights-based management regime including the use of appropriate indicators will be necessary to assure the sustainable use of these resources.

Recommendations

- I. Assess the potential of new fisheries and expansion of fisheries for under-exploited fisheries resources based on existing information.
- II. Collaborate with fishers, researchers and other stakeholders to collect outstanding information to further assess the potential resources.
- III. Conduct exploratory fishing and research activities to substantiate existing information and to determine the biology and distribution of the resource.
- IV. Integrate proposed management strategies into the national fisheries management framework and regulate the development of these fisheries based on the precautionary approach by:
 - a) imposing conditions and limitations on access to these fisheries (rights-based fisheries) including the use of responsible fishing technologies and practices;
 - b) establishing appropriate mechanisms to monitor the progress of new fisheries toward sustainable development; and
 - c) developing appropriate guidelines and assistance to promote the commercial exploitation of the identified resources.
- V. Enhance regional information exchange related to studies of commercial fisheries in the region with particular reference to trans-boundary stocks.
- VI. Conduct appropriate studies on the market viability of fish catches from new and under-exploited fisheries.

Addendum

Conclusion

There was general support for the content of the Technical Document, including its conclusions and recommendations. Traditional resources in the Eastern Indian Ocean and in the Western Central Pacific are fully or over-exploited. However, based on available information, several under-exploited resources exist, including deep-water demersal species, small pelagics in offshore areas, and different species of oceanic squid. Suitable capture technologies for these resources need to be developed. Because of their vulnerability, slow

growth rates and limited reproduction potential, exploitation of deep-water resources should be strictly controlled.

Recommendations

The recommendations in the Technical Document were endorsed with the following additions:

- a) Promote a regional approach to the research, management and development of fisheries for new resources to optimize the limited planning, development and monitoring capacity of individual ASEAN countries;*
- b) Improve stock assessment methodologies and their comparability across the ASEAN region;*
- c) Establish collaborative programs to research the deep-sea areas of the South China Sea;*
- d) Manage the development or expansion of underexploited resources, using an ecosystem approach to take account of the important interrelationships between species in coastal and offshore waters and to ensure strict control of exploitation of deep-water resources, including use of limitations on access.*

2.2 Management of Fishing Capacity

Conclusion

The successful implementation of appropriate fisheries management frameworks is crucial to food security in the ASEAN region. Despite many constraints and limitations, the management of fishing capacity is deemed to be one of the most important methods for regulating the exploitation of fisheries resources in this region. This concept needs to be urgently developed and incorporated into the national fisheries management framework in order to prevent further degradation of these resources and maintain fishing capacity at levels commensurate with sustainable yields.

Recommendations

Based upon the deliberation and outcomes of the preparatory work for the Conference, the following recommendations are listed for further consideration and endorsement:

- I. Take steps to prevent the build-up of excessive fishing capacity where fisheries resources are considered to be under-exploited.
- II. Identify steps needed to limit access (rights-based fisheries) when over-capacity exists. Suggested measures include:
 - a) Implementing an improved system of national and local registration of fishing vessels;
 - b) Freezing the number of fishing vessels at existing levels;
 - c) Reducing the number of vessels at the appropriate rate, on an adaptive basis that takes into account the best available information;
 - d) Closely monitoring the impact of vessel reduction on the fisheries resources;
 - e) Providing training on alternative occupational skills and incentives to encourage boat owners and fishers to leave over-exploited fisheries; and
 - f) Developing appropriate indicators to assist in the management of fishing capacity.
- III. Promote monitoring, control and surveillance (MCS) capability to reduce unauthorized or illegal fishing.
- IV. Promote and strengthen awareness and consensus at all levels on the economic nature of fisheries management, in particular the management of fishing capacity.

V. Each ASEAN Member Country prepare a national plan of action in consultation with stakeholders in the management of fishing capacity, taking due account of the regional specific issues as per the recommendations of the IPOA.

Addendum

Conclusion

There was general support for the points raised in the Technical Document. To manage capacity input controls are more enforceable and applicable in the region than output controls, such as quotas. Though considered essential for profitable and sustainable fisheries, effective management of fishing capacity may require difficult and potentially contentious political decisions on limiting and allocating rights to fish. While a freeze on numbers of fishing vessels is an important first step, the impact of such an action on stocks tends to be rapidly dissipated by increasing fishing effort. Programs to reduce fleet capacity have encountered implementation problems and have met with mixed success. Such programs require effective and transparent administration to support the investment needed to retire vessels, to give security to the property rights created, and to closely monitor impacts. Effective management of capacity requires a comprehensive approach to the entire fisheries sector, and in some cases an international approach, to remove counterproductive subsidies and prevent unwanted migration of vessels to other over-exploited fisheries. Monitoring, control and surveillance (MCS) capabilities need to be effectively promoted to ensure compliance with new access regulations and to reduce illegal and unauthorized fishing in general.

Recommendations

The recommendations in the Technical Document were endorsed with the following additions:

- a) Prepare national plans of action to manage capacity which give careful consideration to their equitable application in small-scale fisheries and to the means of transferring fishing rights and licenses, and which draw on the experience gained outside of the region in design and implementation of such plans;*
- b) Examine the merits and feasibility of preparing a regional plan of action for the management of fishing capacity;*
- c) Ensure that policies aimed at managing capacity are compatible with other sector policies, especially those that may directly or indirectly provide incentives to further increase fishing capacity;*
- d) Include information on ownership and capacity of vessels in registers of fishing vessels;*
- e) Apply a precautionary approach to management of capacity in cases of uncertainty regarding the state of the resources and the fishery;*
- f) Introduce capacity management mechanisms, whenever possible, before the resources are overexploited to avoid severe social and financial consequences resulting from reduction of fishing capacity;*
- g) Promote active participation of fishers in the implementation of the national plans of action, especially through strengthening fisher organizations, awareness building, and education programs.*

2.3. Indicators for Sustainable Fisheries

Conclusion

The use of indicators of sustainability needs to be more fully investigated. Many fisheries are fully- or over-exploited and there is considerable concern in ASEAN Member Countries over the well-being and maintenance of fisheries resources both now and in the future. The use of indicators provides a simple and effective means of assessing the state and condition of fisheries resources and a management tool to assess the impact of effort control strategies.

Recommendations

- I. Consider the use of indicators as a management tool to achieve sustainable fisheries in the ASEAN region.
- II. Formulate appropriate guidelines for the use of indicators as an effective fisheries management decision-making tool within the national fisheries management framework by:
 - a) Identifying indicators on the state, condition and response of fisheries and fisheries resources in management actions;
 - b) Selecting indicators based on criteria, including the availability of data and information, so that the indicators are practical, simple, applicable and understandable to all stakeholders;
 - c) Considering the difficulty of applying model-based fisheries management in small-scale and multi-species fisheries; and
 - d) Considering the two functions of indicators: i) provision of appropriate information for the policy-making decisions, and ii) facilitation of day-to-day management actions at the local level (feedback approach).
- III. Incorporate appropriate mechanisms for collecting data and information supporting indicators in routine (national fishery statistical system) and non-routine (research) exercises.
- IV. Establish appropriate close monitoring systems for fishing operations in order to measure the response of fisheries (feedback approach) and take appropriate management actions using indicators.

Addendum

Conclusion

The meeting concluded that there were significant potential advantages in moving to indicator-based management systems. Indicators should complement other management tools. Indicators should include analysis of trends and may include indices of performance based on standard data collection from the fisheries. In due course this may be supplemented by additional research and refinement of indicators of value to the whole industry. Definition of key indicators should be a pragmatic process that provides widely understandable and useful parameters of the resource, the fishery, and its social and economic character. Issues of scale in moving from a discrete local fishery to more complex interacting fisheries, and then to the national scale, must be taken into account to provide appropriate management indicators at all levels.

Recommendations

The recommendations in the Technical Document were endorsed with the following additions:

- a) *Develop and evaluate the use of appropriate indicators and methods for selection of suitable indicators on a pilot level for defined fisheries and fishers groups;*

- b) *Emphasize the selection of simple, pragmatic indicators, which are understood as widely as possible by stakeholders;*
- c) *Examine approaches to the use and scaling of indicators at an aggregate level, and assess the possible consequences of formulating policy and management decisions on the basis of indicators; and*
- d) *Consider the establishment of regional fisheries information repositories with a view to sharing experiences and lessons on the use of indicators for fisheries management in the region.*

2.4 Fishery Statistics

Conclusion

Fisheries statistics are a key component of a fisheries information system required for policy, planning, monitoring and management of fisheries. Improvements to national and regional fisheries statistical systems, including data collection, analysis and reporting, are required to maximize the utility, timeliness, accuracy and reliability of fisheries statistics.

Recommendations

National Level

- I. Strengthen national fisheries statistical systems as part of a national decision framework for policy-making, planning, and monitoring to achieve sustainable fisheries by:
 - a) Adapting the “Regional Plan of Action for the Improvement of Fishery Statistics” and the “Minimum Requirements of a National Fishery Statistical System in ASEAN Region”, with due regard to the current needs and issues of fisheries in the region;
 - b) Clearly determining the objectives and minimum requirements of fishery statistical data and information with particular reference to national and local requirements;
 - c) Taking measures to effectively coordinate the collection and use of fisheries statistical data between the national fisheries authority and other competent authorities including those responsible for trade, vessel registration, freshwater aquaculture and rural development;
 - d) Building capacity at both national and local levels to collect, compile, analyze and disseminate quality statistical data and information in a timely manner as an empirical basis for formulating policies and decisions for fisheries management;
 - e) Prioritizing statistical data and information needs with particular reference to practical indicators for fishery management and the specific requirements of the region’s fisheries;
 - f) Where appropriate, applying internationally or regionally standardized methodologies for statistical data to facilitate regional compilation and data exchange; and
 - g) Reviewing the national fishery statistical systems in order to identify areas needing improvement.

Regional Level

- II. Support, upgrade and expand regional fisheries statistical systems by developing regionally compatible methodologies for national statistical data to facilitate regional fisheries assessment and data exchange.
- III. Promote technical cooperation between national agencies responsible for fisheries statistics to improve national systems, including development of guidelines and handbooks.

Addendum

Conclusion

Fishery statistics will play a key role in the development of sustainable fisheries and the achievement of food security in the ASEAN region. The Technical Document reflects the scope of the concerns and issues raised.

Recommendations

The recommendations in the Technical Document were endorsed with the following addition:

- a) Consider provision of sustained government support for the improvement and refinement of national fishery statistical systems.*

PANEL 3: SUSTAINABLE AQUACULTURE

3.1 Supply of Good Quality Seeds

Conclusion

It has been projected that as the people of Southeast Asia continue to increase in number and affluence there will be an increasing supply and demand gap for aquatic products. In general, capture fisheries are either stable or in decline. Accordingly there will be an increasingly significant role for aquaculture in this millennium. As discussed in this topic, one of the main constraints to enhancing aquaculture production in the ASEAN region is the inadequacy of supply and quality of seed stocks and the required domesticated broodstocks. The issues raised on the supply of quality seed are of primary concern in order for ASEAN Member Countries to meet the increasing internal demands for aquatic products and to maintaining their positions as major suppliers of aquaculture products to international markets. It is incumbent upon national governments to lead the promotion and regulation of responsible aquaculture development by enhancing the supply of good quality seeds.

Recommendations

- I. Promote the development of domestic broodstocks and reproductive technologies by:
 - a) Identifying and prioritizing the aquatic commodities that require government support for captive broodstock development in order to hasten private hatchery development;
 - b) Encouraging the production of high quality seeds by the private sector through incentives including support of research and development, markets for seed and assistance with accessing and developing domestic broodstock; and
 - c) Promoting the responsible collection and use of wild broodstock and seed.
- II. Develop and implement policy and regulatory frameworks that will enhance seed production in a structured and controlled manner and mitigate against adverse environmental and socio-economic impacts by:
 - a) Recognizing fundamental differences in reproductive protocols for producing seed for aquaculture and seed for stock enhancement;
 - b) Controlling the introduction and transfer of wild and domesticated broodstock and hatchery-produced seeds; and
 - c) Mitigating the loss of economic opportunity for marginal fishers who derive their income from the collection of wild seeds.
- III. Support and encourage research institutions to pursue research and development programs that are directed toward the production of high quality seed on a consistent and sustainable basis for aquaculture and stock enhancement purposes by:

- a) Promoting collaboration between the government, research institutions and private hatcheries, within and among ASEAN Member Countries to improve: methodologies to manipulate the reproductive cycles of captive broodstock; fundamental knowledge of the essential requirements of broodstock, larval and juvenile nutrition; and hatchery seed production protocols of key aquatic commodities;
 - b) Understanding the genetic fitness of seed for stock enhancement and subsequent interactions and impacts on wild populations; and
 - c) Developing domesticated broodstocks with high levels of heritability of desirable traits.
- IV. Support and encourage proactive extension and technology transfer mechanisms by government agencies and private and public sector research institutions by:
- a) Disseminating developed captive broodstock and seed production technologies to all sectors of the aquaculture industry, particularly to small-scale hatcheries;
 - b) Enhancing the capabilities of farmers to improve seed quality for culture by improving their broodstock management schemes;
 - c) Demonstrating the benefits of the proper collection and handling of wild broodstock and seed stock; and
 - d) Improving awareness of the negative impacts on sustainability through the uncontrolled introduction of seed to open water bodies.

Addendum

Conclusion

There was general support for the key issues raised in the Technical Document. Domestication and basic genetic management of broodstock and ensuring egg/larval quality are essential for aquaculture development. More emphasis should be placed on developing and establishing criteria and procedures for certification of quality broodstock and seeds, and on addressing environmental and socio-economic issues relating to seed quality. Small-scale fish farmers should have access to quality seeds and broodstock. Cooperation and collaboration between industry, government and research institutions at the national, regional and international levels should be promoted to ensure efficient production of quality seeds.

Basic and applied research on broodstock and larval biology should include: maternal transfer of passive immunity, hormones, vitamins, and other beneficial substances to eggs and larvae; probiotics; larval abnormalities; pathology and diseases; environmental factors affecting gonadal maturation and spawning; genetic markers; and larval digestive physiology.

Recommendations

The recommendations in the Technical Document were endorsed with the following additions and clarifications:

- a) *Promote awareness of the impacts of domestication and broodstock management practices on the genetic status of stocks in terms of both performance under aquaculture and impact on natural biodiversity;*
- b) *Develop and maintain broodstock for aquaculture and stock enhancement separately and take steps to minimize genetic change in the seeds for stock enhancement, while continuing genetic improvement of aquaculture stocks;*
- c) *Identify and apply practical criteria for assessing and certifying genetic and non-genetic aspects of broodstock and seed quality;*

- d) *Encourage the use of conventional genetic selection and mating techniques as a primary method for improving cultured stocks;*
- e) *Include genetic management as an integral part of aquaculture planning for new species (and where aquaculture is in the initial stage of development), and draw on lessons learned from countries with advanced aquaculture programs;*
- f) *Support research to fill knowledge gaps in broodstock and larval biology;*
- g) *Establish in situ and ex situ gene banks which include cryopreserved sperm, and develop technologies for embryo storage;*
- h) *Establish reference collection centres for species of algae and zooplankton which have potential as larval feeds, and develop mass culture techniques for larval live food organisms such as copepods;*
- i) *Encourage collaboration and cooperation in seed production research and information exchange with countries both inside and outside the region;*
- j) *Examine means of ensuring that small farmers have access to good quality broodstock and seeds at affordable prices; and*
- k) *Concentrate government support on assisting farmers to diversify into culture of new species and on ensuring the genetic quality of broodstock, rather than on competing with the private sector in the mass production of seed.*

3.2 Environment-Friendly Aquaculture

Conclusion

It is incumbent upon all stakeholders to ensure that concerted and co-operative initiatives be directed toward the development of sustainable aquaculture that is technically feasible, economically viable, socially equitable and environment-friendly.

Despite its obvious economic benefits, aquaculture may have adverse impacts on the environment, including: water pollution, loss of habitats and ecosystem functions, disease outbreaks, biodiversity impacts and resource-use conflicts. Likewise other activities such as agriculture and industry may have negative impacts on aquaculture. Unless addressed these will constrain aquaculture's continued growth and development. This is achievable through integrated planning, appropriate site selection and management procedures and assessment of environmental and socio-economic impacts. Expansion of aquaculture activities within the ASEAN region requires that due diligence be exercised with respect to environmental issues in order to enhance the positive environmental and social benefits.

Recommendations

- I. Promote the development of environment-friendly and sustainable aquaculture through the application of appropriate aquaculture technologies and methodologies by:
 - a) Promoting aquaculture systems that are biologically and technically feasible and compatible with socio-economic development, rural livelihoods and food security;
 - b) Implementing an integrated system approach to aquaculture that recognizes the diversity of agriculture farming systems, resources, capabilities and environments; and
 - c) Developing aquaculture in harmony with other resource users and environment requirements with particular regard to zonal planning.
- II. Develop a comprehensive policy and regulatory framework that is directed toward environmental sustainability and incorporates a consultative process with all stakeholder groups that includes:
 - a) Establishing priorities and future directions based upon: sustainable growth; the use and allocation of resources; the effectiveness of research and extension activities;

- b) Incorporating environmental impact assessments and the monitoring and control of aquaculture and related activities;
 - c) Regulating the introduction and transfer of aquatic organisms, particularly non-indigenous and exotic species; and
 - d) Regulating water extraction, chemical inputs and effluent treatment and discharge.
- III. Support the effective development and delivery of environmental-friendly and sustainable technologies and management methodologies through technology transfer, extension, education and training by government agencies and educational and research institutions by focussing on:
- a) Improving practitioners' awareness of environmental issues associated with the industry and the potential impacts of their activities;
 - b) Responsible use of feeds and effective feeding management; and
 - c) Aquaculture engineering, production technologies and management and husbandry practices.
- IV. Support and encourage research institutions to pursue research programs that are directed toward the advancement of environment-friendly and sustainable aquaculture technologies and practices that are both viable and applicable to the socio-economic and cultural contexts within the ASEAN region.

Addendum

Conclusion

The positive environmental impacts of aquaculture were stressed, emphasizing that most inland aquaculture makes an important contribution to the livelihoods of rural people without significant adverse environmental impact. Development of low impact systems for brackishwater and marine aquaculture is highly desirable. Aquaculture can add value to inland and coastal environments if environmentally sound technologies and farming systems and effective planning processes are adopted. Advance planning is essential for aquaculture development, and while zoning of culture areas is an important option, it is not appropriate for all systems and locations. Environmental Impact Assessment (EIA) is recognized as a useful tool for individual projects, but it is less useful for small-scale aquaculture, or for predicting cumulative effects of large numbers of individual farms.

Environmental sustainability should be a core principle in ASEAN aquaculture development. Environmentally sound aquaculture development is achievable through: appropriate aquaculture systems and management practices; planning processes that allow balanced use of resources for aquaculture in harmony with other resource uses; effective policy and regulations; effective institutions; information generation and exchange to inform practitioners and governments; and through regional cooperation.

Recommendations

The following recommendations were made as an addition to those in the Technical Document:

- a) *Promote small-scale, low impact, culture systems as an entry point for aquaculture development in inland and coastal areas;*
- b) *Recognize that advance planning is important to avoid potential environmental effects from proliferation of large numbers of small-scale farms in some areas;*
- c) *Promote institutional linkages and integrated approaches in aquaculture research, education and development;*

- d) *Integrate the concept of sustainable aquaculture in training and educational programs;*
- e) *Ensure that intensive aquaculture remains within the carrying capacity of the environment;*
- f) *Emphasize research and exchange of experiences on diversification of marine culture species and integrated coastal aquaculture;*
- g) *Develop the capacity of communities and local governments for community-level planning and environmental management of aquaculture;*
- h) *Focus more attention on assessing the cumulative environmental impacts of large numbers of small-scale farms;*
- i) *Ensure that regulations are technically-based, solution-oriented and progressive;*
- j) *Develop standards, indicators and critical points for monitoring aquaculture;*
- k) *Establish codes of practice, farm accreditation systems and other self-regulatory schemes to encourage compliance and better environmental performance;*
- l) *Promote cooperation between researchers and industry;*
- m) *Emphasize non-technical aspects of aquaculture in extension programs, such as environmental management and socio-economic issues;*
- n) *Establish information systems on the environmental impacts of major production systems and make this information accessible to facilitate more effective information exchange among farmers and between farmers and government institutions;*
- o) *Promote effective regional cooperation among national and international agencies supporting aquaculture in the ASEAN region;*
- p) *Use the Code of Conduct for Responsible Fisheries and Regional Guidelines as a framework for further cooperation and mutual support for responsible aquaculture development within ASEAN.*

3.3 Getting Out of the “Fish Meal Trap”

Conclusion

The above issues highlight the severe constraints impinging on aquaculture by an over-reliance on fish meal as a primary feed ingredient. Therefore, for aquaculture to increase in importance as a major net contributor to human food supply within the ASEAN region, aquafeeds need to become less reliant on fish meal and fishery products as principal sources of nutritional protein, and suitable, cost-effective substitutes have to be sought. The development of cost-efficient and environment-friendly aquafeeds with low or no inclusion of fish meal, in association with the optimization of feed utilization, requires a concerted effort. It is concluded that prompt action by concerned authorities is required if the ASEAN region is to extricate itself from the ‘fish meal trap’ and realize continued expansion of aquaculture production in a sustainable manner.

Recommendations

- I. Develop a policy and regulatory framework for both the aquaculture feed production industry and use of aquatic feeds by fish farmers that address the issues of:
 - a) Quality criteria and standard for manufactured feeds;
 - b) Guidelines for the use and management of feeds including food conversion ratio (FCR) at farm level, and levels of soluble and suspended nutrients in aquaculture effluents; and
 - c) Domestic production of high-quality fish meals (low temperature, high digestibility) and other animal and plant protein sources. (animal and plant meals).
- II. Develop and support collaborative research initiatives in aquatic feeds directed toward reducing the industry’s dependence on fish meal that will:

- a) Be interdisciplinary including expertise in fish physiology and nutrition, crop science, biochemistry and chemical engineering;
 - b) Identify protein sources that can be used as cost-effective fish meal substitutes in aquatic feeds and are either currently available or could be produced within the region; and
 - c) Develop optimized feeds and feeding regimes for specific species and life stages.
- III. Promote proactive extension and technology transfer mechanisms by government agencies and research institutions that would include:
- a) Employment of proper on-farm feed and feeding management protocols; and
 - b) Education on the impacts on the environment and farm viability of using inappropriate feeds, feeding protocols and overfeeding.

Addendum

Conclusion

The recommendations in the Technical Document were seen as contributing to reduced dependence on fishmeal in fish feeds. It was recognized that much research has been done on the substitution of fish meal in fish feeds, and that this knowledge will be used by the fish feed and aquaculture industries when changes in feed composition are demanded by aquaculturists, or by society. It was thought important that regulations concerning fish feed quality standards and fish feed use be developed through close consultations between aquaculturists, fish feed manufacturers, and government regulatory agencies. Regulations should be introduced gradually, possibly by making use of economic incentives. It was also recognized that there is potential for expanding the culture of non-carnivorous species, including marine finfish, in the ASEAN region.

Recommendations

The recommendations made in the Technical Document were endorsed with the following additions:

- a) *Recognize that, to be effective, actions aimed at reducing the use of fish meal by commercial and rural aquaculturists must respect the economic and social imperatives that dictate the fish feeding practices of these two groups;*
- b) *Conduct national surveys of availability, cost and possible use of non-traditional fish feed ingredients;*
- c) *Encourage, through public programmes, an expansion in the culture of non-carnivorous species through national and international campaigns to popularize their consumption, establishing incentives for industry to expand their production, and increasing public sector funds for research on such species.*

3.4 Healthy and Wholesome Aquaculture

Conclusion

The issues identified within the subject area of healthy and wholesome aquaculture are key to ensuring the continued growth and sustainability of aquaculture within the ASEAN region. It is evident that there are three essential requirements with respect to fish health and food safety issues. One is the need to ensure that the well being and health of the organisms being cultured is optimized. The second is to maintain environmental integrity, and the third, but of equal importance, is to ensure that aquaculture products are fit to enter the human food supply with respect to food safety. It is concluded that in order to fulfill these three requirements, proactive measures need to be taken in an expeditious manner.

Recommendations

- I. Control the spread of important pathogens by implementing and enforcing regulatory frameworks specifically designed for this purpose by:
 - a) Requiring justification for the introduction and transfer of aquatic organisms that pose a potential risk to (i) the health of cultured and wild stocks and (ii) biodiversity, within the receiving environment, and undertaking a qualified risk analysis prior to granting permission, using the FAO "Asia regional technical guidelines on health management for the responsible movement of live aquatic animals and the Beijing consensus and implementation strategy";
 - b) Enforcing existing laws and establishment or upgrading of legislation in accordance with relevant international or regional guidelines/treaties/agreements, if necessary, to control the spread of diseases and entry of their carriers;
 - c) Harmonizing local legislation with the provisions in internationally accepted codes of practice (e.g., OIE) on movement of live aquatic animals; and
 - d) Establishing mutual agreement between countries sharing common waterways with respect to warning systems and timely reporting of disease outbreaks.
- II. Accelerate the development of appropriate technology support for diagnosis and control through the sharing of regional resources and capabilities by:
 - a) Harmonizing diagnostic techniques and procedures with a view to technology transfer and standardized reporting;
 - b) Classifying diagnostic techniques according to their levels of complexity and need for supporting equipment;
 - c) Implementing a mechanism for regional and inter-regional referral systems and designation of service reference laboratories;
 - d) Incorporating on-farm and pond-side diagnostics that have proven to be reliable and applicable; and
 - e) Identifying qualified expert individuals and coordinating them into a regional team to be called upon to provide essential services during disease outbreaks.
- III. Enhancing research efforts and encouraging collaboration and information sharing between researchers prioritizing region-wide issues particularly with respect to:
 - a) Aquaculture systems that historically have been highly susceptible to major disease outbreaks and/or negative environmental impacts;
 - b) Domestication and genetic improvement of stocks for sustainable supply of high quality seeds with improved disease resistance.
 - c) Alternative disease prevention measures such as bio-augmentation, probiotic application and the use of herbal medicines in aquaculture;
 - d) Innovation and improvement in culture systems incorporating biodiversity and engineering principles to ensure a wholesome rearing environment; and
 - e) Development of technology for incoming and effluent water treatment and for the remediation and restoration of deteriorated pond environments.
- IV. Maintain environmental integrity through regulatory measures and public education concerning industrial chemicals and therapeutants by:
 - a) The registration and classification of all chemical inputs used in aquaculture, including quality standards, labeling requirements and designated applications;
 - b) Implementing an education and awareness program on the potential hazards of harmful chemicals and their misuse and measures for proper handling and disposal; and
 - c) Seeking regional agreement on measures to eliminate the use of harmful chemicals.
 - d) Ensure the wholesomeness of aquaculture products with respect to food safety by:

- e) Instituting a process for locating aquaculture operations in areas that mitigate against the risk of exposure of the product(s) to chemical and biological hazards;
 - f) Taking measures to ensure that aquaculture products meet food safety requirements; and
 - g) Implementing monitoring and reporting systems to forecast and warn of concentrations of harmful micro-algae.
- V. Support the development and delivery of effective education and extension programs to:
- a) Enhance knowledge and awareness to achieve healthy and wholesome aquaculture in all aquaculture sectors through formal education programs, training and various multimedia venues; and
 - b) Enable aquaculture practitioners to perform field and laboratory tests to reliably diagnose the presence of pathogens and apply measures for their control to prevent outbreaks and the spread of diseases.

Addendum

Conclusion

The session participants generally agreed with the recommendations enumerated in the Technical Document and considered them to be an excellent contribution to a regional strategy for promoting healthy and wholesome aquaculture products. Given the wide disparity in the socio-economic and technological development among countries in the region, the recommendations will be subject to national prioritization. A number of additional recommendations were proposed.

Recommendations

The following recommendations were made in addition to those in the Technical Document:

- a) *Provide support for the implementation of the “Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals”;*
- b) *Foster effective co-operation at the regional and international levels on regional issues such as recognition of centres of resource expertise on aquatic animal health, harmonization of health certification, quarantine and diagnostics, and risk reduction in shared watersheds;*
- c) *Develop and implement national strategies on aquatic animal health including establishment of contingency plans to deal with disease emergencies, accreditation systems for personnel involved in disease control, improved national and regional reporting of aquatic animal diseases, cooperative linkages between fisheries and veterinary authorities, and effective feedback to stakeholders;*
- d) *Increase awareness of the range of vehicles for the spread of diseases and aquatic nuisance organisms, including fouling organisms transported in ballast water;*
- e) *Promote biosecurity in aquaculture systems;*
- f) *Support research on potential zoonosis from aquatic animals;*
- g) *Promote non-regulatory measures, including linkages with crop insurance schemes for farmers compliant with codes of practice on fish health; and*
- h) *Develop human resources for healthy and wholesome aquaculture through research and post-graduate training, creation of career paths for aquatic animal health experts, establishment of aquatic epidemiology training programs, and training teachers to implement such programs.*

3.5 Biotechnology for Aquaculture

Conclusion

There is rapid and dramatic progress being made globally in the fields of agriculture (both plant and animal sciences), medicine and pharmaceuticals through the application of biotechnology. Despite the ongoing and highly publicized debate concerning human and environmental safety of biotechnology products and their acceptability to the public at large, it would seem that biotechnology can aid in increasing food production. From the issues raised above, in order to apply biotechnology in a competent and structured manner to increase fish production through Aquaculture within ASEAN, it is concluded that a number of critical issues need to be addressed.

Recommendations

- I. Build the human and physical aquatic biotechnology capacity within the ASEAN region by:
 - a) Developing a critical mass of highly qualified personnel and trained manpower;
 - b) Providing the necessary research infrastructure to conduct biotechnology-based research and development;
 - c) Committing research funds dedicated to the advancement of biotechnology in support of sustainable aquaculture; and
 - d) Establishing a research and development biotechnology network to facilitate regional cooperation and collaboration.
- II. Develop focused research and development programs that are targeted at improving the productivity and sustainability of aquaculture specifically in the areas of:
 - a) Hormone use and applications;
 - b) Probiotics and Bioremediation
 - c) Immunostimulants;
 - d) Disease resistance;
 - e) Rapid diagnosis and detection of disease; and
 - f) Performance enhancement through genetic engineering.
- III. Seek active representation of aquaculture-related issues within national and regional fora on biotechnology with particular regard to genetic materials, and actively undertake awareness-raising initiatives pertaining to the use and application of biotechnology including:
 - a) Providing fisheries related input to the AMAF and NAGM
 - b) Consultation with aquaculture stakeholders on the benefits and risks associated with the use and application of biotechnology products;
 - c) Reviewing real and potential environmental concerns associated with the use of biotechnology products;
 - d) Addressing ownership issues associated with genetic materials, particularly intellectual property rights protection and bio-prospecting for indigenous germplasm; and
 - e) Protecting against the marginalization of smallholders that may occur through the widespread introduction of proprietary strains of organisms and associated controls on their use.

Addendum

Conclusion

The issues surrounding the implementation and application of biotechnology for aquaculture are complex and are not restricted simply to technical issues. Political considerations, economic factors, education, as well as the legal framework and market forces influence

decisions on the uptake and use not only of biotechnology, but of any new technology, or groups of technologies. These issues must be considered in any discussion of the use of biotechnology for aquaculture. Biotechnology is one tool among many in the arsenal of tools at the disposal of scientists and decision makers to achieve a desired goal. In some cases, it may be more appropriate to use more traditional methods to achieve the intended result either for reasons of cost or ease of delivery of goods and services. Biotechnology should complement traditional approaches to achieve desired goals and targets.

Recommendations

The following issues and recommendations follow on from the Technical Document and are intended as a guide to the implementation of strategies to utilize biotechnology in support of aquaculture in the ASEAN region:

- a) Clarify responsibility and authority for biotechnology issues;*
- b) Harmonize rules and guidelines governing biotechnology within the region;*
- c) Formulate policy on biotechnology with the active participation of all stakeholders, in consultation with researchers from the academic, private and government sectors, and ensure that policy decisions governing biotechnology are based on a stringent, fact-based analysis and assessment of risk;*
- d) Require independent verification and proof of efficacy and safety before biotechnology products such as probiotics are made commercially available to producers;*
- e) Review legislation within ASEAN on Intellectual Property Rights (IPR) related to biotechnology with particular attention to incorporating mechanisms to safeguard national interests, and with due regard to the need for access by small-scale and poor farmers to the products of biotechnology and develop simplified guidelines for IPR issues;*
- f) Ensure that policy and legislation incorporates provisions for risk assessment and establishment of acceptable risk, safeguards the right of stakeholders to informed choice and ensure that regulations on biotechnology for aquaculture are harmonised with those for agriculture, taking into consideration aspects unique to aquaculture products;*
- g) Promote biotechnology to complement rather than to replace traditional approaches;*
- h) Provide support for local development and commercialization of biotechnology products developed within the region, encourage collaboration between the academic, public and private sectors, and consider establishment of a regional gene bank and database system for indigenous species and strains as a common resource for the region;*
- i) Make information on biotechnology and its correct use available in local languages and in forms accessible to the widest audience; and*
- j) Undertake a risk-based assessment of genetically modified organisms (GMOs) and transgenics before they are made widely available.*

3.6 Aquaculture for Rural Development

Conclusion

There is a need for ASEAN Member Countries to take all necessary action to ensure food security, employment and alleviation of poverty for those living in rural areas. To date, increased aquaculture activity within the ASEAN region has been a demonstrably effective vehicle for rural development. However, aquaculture has only recently been considered in multi-sectoral rural development strategies, and even then on a restricted basis. From the issues discussed it is concluded that in order to further advance the desired results of socio-

economic benefits and improved food security through aquaculture, growth of this sector requires a structured and effective approach.

Recommendations

- I. Promote and support the integration and development of aquaculture in rural areas by all stakeholders, including rural development organizations, recognizing the need for:
 - a) Environmental sustainability;
 - b) Increased employment opportunities for rural populations; and
 - c) The applicability of integrated agriculture/aquaculture systems in rural areas for improving food security and enhancing cash crop production.
- II. Develop and implement a clearly defined strategy to incorporate aquaculture into rural development involving the required policy change and regulatory frameworks. This would include, but not be limited to:
 - a) The identification of the responsible government department or agency for aquaculture development, collecting of statistical data and integration activities;
 - b) The clear definition of inter-relationships and referral mechanisms between departments and agencies; and
 - c) The development of clear and comprehensive planning procedures to: involve the participation of rural communities as key stakeholders in aquaculture development; minimize the potential for resource user conflicts; provide for dispute resolution mechanisms; delineate zoning policies.
- III. Develop the required infrastructure necessary for aquaculture development and develop and implement support programs for rural communities to: facilitate entry into aquaculture ventures and; successfully market their production:
 - a) Check and reverse the degradation of the rural environment, particularly impounded freshwater bodies and deforested mangroves;
 - b) Improve public and private facilities and infrastructure such as roads, power supply lines, cold storage facilities and markets;
 - c) Make credit and financing available to enable local people to venture into aquaculture in rural areas; and
 - d) Provide assistance in marketing in terms of identifying potential markets, keeping farmers posted on prices and matching producers and buyers.
- IV. Support the development and delivery of effective extension programs to:
 - a) Provide continuing education, training and institutional support to extension officers and local organizations of small-scale farmers; and
 - b) Transfer the most appropriate technologies for aquaculture development to rural communities while being mindful of social, economic and cultural factors.
 - c) Support and encourage research institutions to pursue research programs that are directed toward the advancement of commercially productive and sustainable aquaculture.

Addendum

Conclusion

Development of rural aquaculture is an appropriate strategy for combating rural poverty which is an ethical, social, economic, and political imperative in ASEAN. There is no single strategy for aquaculture development for the rural poor. Rural aquaculture contributes towards poverty alleviation, in particular through small-scale household or community farming of aquatic organisms for domestic consumption and income generation. It also contributes to national food security by providing low-cost fish to poor rural and urban

consumers. Larger-scale aquaculture enterprises producing for urban and international markets which require higher investment and more intensive technical and institutional support also provide important employment opportunities and economic development in rural areas.

Government support should prioritize rural aquaculture which contributes to the goal of eradicating poverty. National policy frameworks may use poverty profiles in to prepare multi-sectoral, action-based programs to promote rural aquaculture in appropriate inland and coastal areas of the ASEAN region.

Recommendations

The recommendations in the Technical Document were supported with the following additions:

- a) Document traditional farmer practice, successful research and development, and informative case studies to assist the design of rural aquaculture action programs, to reduce duplication of effort, and to avoid known pitfalls;
- b) Establish pilot projects in different ecological and agro-ecological zones or resource systems in ASEAN countries. Recommended steps are:
 - (i) Determine who are the poor and what is the actual and potential contribution of aquaculture to their livelihoods;
 - (ii) Identify resource zones and their corresponding administrative systems;
 - (iii) Form partnerships in each resource zone between poor farmers, relevant agencies at the district, provincial and national levels, and NGOs;
 - (iv) Review the costs, benefits, and risks of various technologies, including seed production, with respect to their contribution to the livelihoods of the poor;
 - (v) Adapt appropriate technologies through pilot projects with poor farmers in each resource zone;
 - (vi) Extend appropriate technologies to the poor in each resource system, using a range of extension strategies appropriate to different contexts; and
 - (vii) Monitor the effectiveness of aquaculture in alleviating poverty.

PANEL 4: SUSTAINABLE UTILIZATION OF FISH AND FISHERY PRODUCTS

4.1 Maximizing Utilization of Fish Catch

Conclusion

Recognizing that the level of harvest in capture fisheries is not likely to increase significantly, it is necessary that efforts be made to maximize the value of the existing fish catch. Ensuring that as much of the fish catch as possible is directed to human consumption will help alleviate shortages in the food supply.

Recommendations

- I. Promote policies and appropriate technologies that encourage the maximum utilization of catch and reduce post-harvest losses.
- II. Improve public and private post-harvest handling and holding capabilities by:
 - a) Improving on-shore facilities; and
 - b) Improving on-board equipment and facilities.
- III. Undertake research in post-harvest technology on:

- a) Utilizing the product from the fisheries on under-exploited resources, especially small pelagic species; and
 - b) Maximizing the utilization and value of resources currently not fully optimized or utilized.
- IV. Promote extension and training activities and assistance programs that will encourage maximum utilization of catches.
- V. Enhance information exchange and develop appropriate regional guidelines related to the maximum utilization of catch.
- VI. Improve the pricing structure of fish to one which can count on the level of quality of fish.

Addendum

Conclusion

The recommendations in the Technical Document were considered a suitable approach to maximizing utilization of fish catch in the region. However, cost effectiveness and technical feasibility of identified activities should be carefully analyzed during implementation. In the case of unwanted by-catch, efforts should first concentrate on the use of appropriate fishing gear to minimize such by-catch. Adequate training in fish handling for fishermen and other workers in the fish distribution chain is vital to maximize utilization of the catch, ensure sanitary standards, retain nutritional value, improve quality of fish products and contribute to food security. Improvements in processing and handling on-shore will lead to improvements in catch handling on-board.

Recommendations

The recommendations made in the Technical Document were endorsed with the following additions:

- a) *Promote the use of by-catch reduction and exclusion devices where appropriate;*
- b) *Investigate the use of technical innovations for on-board handling including chilled sea water, salting, and increase in fish storage capacity;*
- c) *Promote research and development targeting improved utilization of by-catch for human consumption; and*
- d) *Ensure that training efforts take into consideration the specific needs of fishermen.*

4.2 Improved Traditional Fish Products

Conclusion

Traditional fish products are an important component of the diet for people in ASEAN Member Countries. Considering their importance, it is imperative that the quality and safety of these products be improved. However, in improving traditional products, consideration must be given to their unique nature and their cultural and social importance.

Recommendations

- I. Promote and preserve production and use of the diversity of traditional fish products by:
- a) Securing a stable supply of quality raw materials through maximized use of fish catch, improvement of infrastructure, and use of improved price structures;
 - b) Assisting processors to improve their processing and operational capabilities; and
 - c) Assessing the importance of social, economic, and cultural implications of traditional fish products.

- II. Strengthen research and training activities to improve the quality and safety of traditional fish products.
- III. Improve the marketing of traditional fish products.
- IV. Promote exchange of information on traditional fish products with emphasis on their processing, identity, nutritive value, standardization and safety.
- V. Take measures to ensure that traditional fish products meet food safety requirements, taking into account traditional methods of processing, storage and distribution.

Addendum

Conclusion

The conclusions and recommendations of the Technical Document were found appropriate to improving traditional fish products in terms of product quality and safety and supply of raw materials. The importance of traditional products in the diet was stressed and the cultural dimension of traditional fish products was emphasized as an important part of the heritage of this region. As many of these products are produced by small and medium enterprises (SMEs), improvements to traditional products require access to microcredit and effective coordination between the government agencies involved.

Recommendations

The recommendations made in the Technical Document were endorsed with the following additions:

- a) *Provide training and exchange of know-how to workers at all levels of the traditional fish products sector, building on the varied experience and knowledge available in countries in the region; and*
- b) *Foster applied research to characterize processes and products to develop appropriate codes of practice and training modules for improving traditional fish products.*

4.3 Fish Quality, Safety And Management Systems

Conclusion

Implementation of an effective quality/safety management systems is essential if ASEAN Member Countries want to expand their fish trade and increase competitiveness of fish and fishery products for national, regional and international trade. Likewise, the production of a good quality safe product for domestic markets is necessary in order to ensure food security for the region.

Recommendations

- I. Promote the use of quality/safety management systems that are appropriate for the region at all levels of fish production, handling, processing and trade.
- II. Adapt internationally recognized quality/safety management systems so that they may be applied to SMEs in the ASEAN region.
- III. Improve public and private on-board and on-shore handling and holding capabilities, facilities and infrastructures, both for capture and aquaculture products.
- IV. Ensure that legislation exists or is developed or upgraded regarding the quality, safety, and control of fishery products, and that the application of legislation is harmonized between control agencies at all levels of government.
- V. Harmonize, as far as possible, the standards applicable to fishery products in accordance with relevant internationally recognized provisions.

VI. Develop materials and conduct training for the implementation, validation and verification of HACCP based systems, and improved personnel and laboratory practices.

Addendum

Conclusion

The analysis presented in the Technical Document was found relevant to the issues of fish quality, safety and management systems. These systems are required to ensure safe, wholesome and nutritious fish products as required for food security. Implementation of HACCP-based systems is well under way for the large export-oriented industry, but further work needs to be done for their adaptation and implementation for SMEs in the region. The importance of training and extension programs was emphasized. The importance of harmonization of the standards, guidelines and recommendations applicable to fish and fish products in the region with internationally recognized provisions and the development of regional inter-laboratory proficiency testing programs were highlighted. Because of the specific safety issues related to aquaculture products, the region is also faced with the challenge of implementing appropriate quality/safety systems including good aquaculture practices (GAP).

Recommendations

The recommendations made in the Technical Document were endorsed with the following additions:

- a) Implement GAP and HACCP-based systems for the production and distribution of aquaculture products in the region; and*
- b) Develop a regional inter-laboratory proficiency testing program.*

4.4 Sanitary and Phytosanitary Measures

Conclusion

The Agreement on the Application of Sanitary and Phytosanitary Measures sets out the basic rights and obligations for food safety and animal and plant health. ASEAN needs to involve itself in the formulation of guidelines that interpret this Agreement. It needs a mechanism to develop common positions and in facilitating the harmonization of fisheries standards. The following recommendations are suggested to assist ASEAN Member Countries in meeting these challenges.

Recommendations

- I. Strengthen ASEAN policy on fish and fishery products to harmonize standards and develop a joint approach in addressing international and regional issues.
- II. Harmonize sanitary measures with international standards, as practically as possible, by:
 - a) Enhancing participation and inputs of ASEAN countries in international fora, including WTO/SPS, Codex and Office International des Epizooties (OIE) meetings;
 - b) Developing standards for regional products traded internationally; and
 - c) Improving science-based information to support the development of standards, practices, and control measures.
- III. Develop a regional framework for collaboration on food safety and fish health management including:
 - a) Strengthening of fish inspection and quality control systems, particularly with regard to the safety and health status of raw materials;

- b) Mechanisms for the recognition of equivalence for fish inspection and control systems among ASEAN Member Countries; and
- c) Risk analysis procedures and processes on fish and fishery products.

Addendum

Conclusion

The analyses presented in the Technical Document were found relevant to the application of the SPS Agreement in the region. It was noted that ASEAN needs to play an active role in SPS discussions in international fora, including WTO, Codex, and the Office International des Epizooties (OIE) to ensure that ASEAN interests are taken into account. Inter-agency coordination of SPS issues is important. Mechanisms need to be established to ensure effective regional coordination and liaison between responsible individuals and competent ASEAN institutions and to facilitate the development of a common platform in international fora. Capacity building through training and technical assistance is important to the region, with particular reference to risk analysis. It was noted that the recommendations did not include quarantine and needed to be further clarified.

Recommendations

The recommendations in the Technical Document were endorsed with the following additions:

- a) *Facilitate the implementation of a mechanism for improving regional coordination and collaboration by discussing the relevant issues at the highest level, such as SOM-AMAF and the ASEAN Secretariat;*
- b) *Incorporate a reference to requirements for quarantine into all the SPS Technical Paper recommendations;*
- c) *Incorporate a reference to the Agreement on Technical Barriers to Trade (TBT) and to the International Plant Protection Convention (IPPC) into Recommendation II found in the Technical Document; and*
- d) *Promote capacity building through training and technical assistance.*

4.5 Fisheries Subsidies

Conclusion

Subsidies can have a negative impact on fisheries sustainability. At the global level only a small fraction of the subsidies can be considered 'good'. However, most fisheries subsidies applied in the ASEAN region do not promote overfishing, and are not considered to cause significant trade distortions. The level of subsidies in ASEAN is low compared to OECD countries. However, further study on the extent and impact of subsidies is required. A large proportion of government transfers to the fisheries sector in ASEAN Member Countries is necessary for basic infrastructure development, to keep pace with emerging global product standards, to promote change toward sustainable practices, for poverty alleviation, or for other social reasons. A harmonized ASEAN position on fisheries subsidies will be of value in the ongoing international debate.

Recommendations

- I. Remove subsidies which are clearly shown to contribute to unsustainable fisheries practices, especially those encouraging expansion of fishing capacity for fully exploited resources.

II. Review, in collaboration with international technical organizations such as FAO, the empirical effect of fishery subsidies on essential social and developmental issues, particularly in support of the poor and disadvantaged of the ASEAN region, and effective fisheries management.

III. Develop a regional policy on fisheries subsidies, considering the regional specific requirements, and produce regional guidelines for fisheries subsidies.

IV. On the basis of the regional guidelines, promote a harmonized regional position on fisheries subsidies, at both national and international fora.

Addendum

Conclusion

The recommendations in the Technical Document were seen as an appropriate regional approach to managing fisheries subsidies in the ASEAN region. Much work has been done by SEAFDEC to identify the fisheries subsidies provided by ASEAN Member Countries. However, the details of subsidies and their effects are not yet well known. Although there is agreement that subsidies which lead to excessive fishing capacity should be phased out, there is little practical experience in the fishery sector on how to approach such a task. It was observed that there are a number of different ways to categorize subsidies and that World Trade Organization (WTO) members, under the Subsidies Agreement (SCM), are obliged to notify WTO of all subsidies.

Recommendations

The recommendations made in the Technical Document were endorsed with the following additions:

- a) Carry out in-depth empirical studies of the effects of fisheries subsidies on resource sustainability and trade in fish and fish products, whenever information on these effects is missing or doubtful, and before deciding on removal of fisheries subsidies;*
- b) Assemble and review available experience on how to phase out subsidies, including an evaluation of any lessons that can be learned from the experience obtained in removing agricultural subsidies;*
- c) Conduct a census of fishery subsidies throughout all sub-sectors of the fishery sector at suitable intervals; and*
- d) Develop an ASEAN consensus on what would constitute a suitable categorization of fisheries subsidies to be used in the forthcoming WTO negotiations on fishery subsidies.*

4.6 Eco-Labeling

Conclusion

Eco-labels are an emerging market device which is likely to affect the region's international trade. If appropriately used, eco-labels can contribute to the sustainable use of the region's fish resources and food security. Some existing eco-labels used for fish products are currently outside the ownership and control of governments or inter-governmental agencies, which is a matter of concern to ASEAN Member Countries. The challenge for the ASEAN region is to ensure a regionally-sensitive application of eco-labels for fish products while guarding against their use as non-tariff trade barriers and discrimination against ASEAN products in international trade.

Recommendations

- I. Regional guidelines/criteria on labelling relating to sustainable fisheries and environmental issues should be developed and promoted as a regional reference and inputs for development of international guidelines/criteria for eco-labelling.
- II. ASEAN Member Countries should support FAO in the preparation of general guidelines and criteria for eco-label certification of fish products.
- III. Eco-labelling schemes should be controlled and supervised by appropriate authorities, in particular:
 - a) The government fisheries authority should be fully responsible for certification of capture fisheries in national waters;
 - b) Appropriate Regional Fisheries Management Bodies, in cooperation with national authorities, should be fully responsible for eco-labels associated with high seas fisheries;
 - c) In the case of aquaculture, the government fisheries agency considers delegating the task of eco-labelling to producers' organizations.
- IV. The region should consider "The Regionalization of the Code of Conduct for Responsible Fisheries" as a basic framework for any "eco-labelling" schemes which may be promoted.

Addendum

Conclusion

The Technical Paper provided relevant background and fairly reflected the regional issues associated with eco-labelling. A general view emerged, that due to the predominance of small-scale fisheries, ASEAN Member Nations were not ready for such labelling. Structural complexities were identified as impediments to the flow of any benefits to the fisher from the marketing of eco-labelled products. However, it was noted that eco-labelling is an emerging factor in the seafood markets of ASEAN's export trading partners. Concern was expressed that such a trend may discriminate against developing nations whose small scale fisheries were difficult to assess and manage due to their multiple species and multiple gear nature. It was broadly accepted that there was a need to develop regional eco-label guidelines based on the regionalized "Code of Conduct for Responsible Fisheries" and that FAO be invited to assist in this regard. It was noted that it would be desirable to learn from experience gained in the application of certification schemes through the sharing of information at a technical level.

Recommendations

The recommendations in the Technical Document were endorsed with the following amendment and addition:

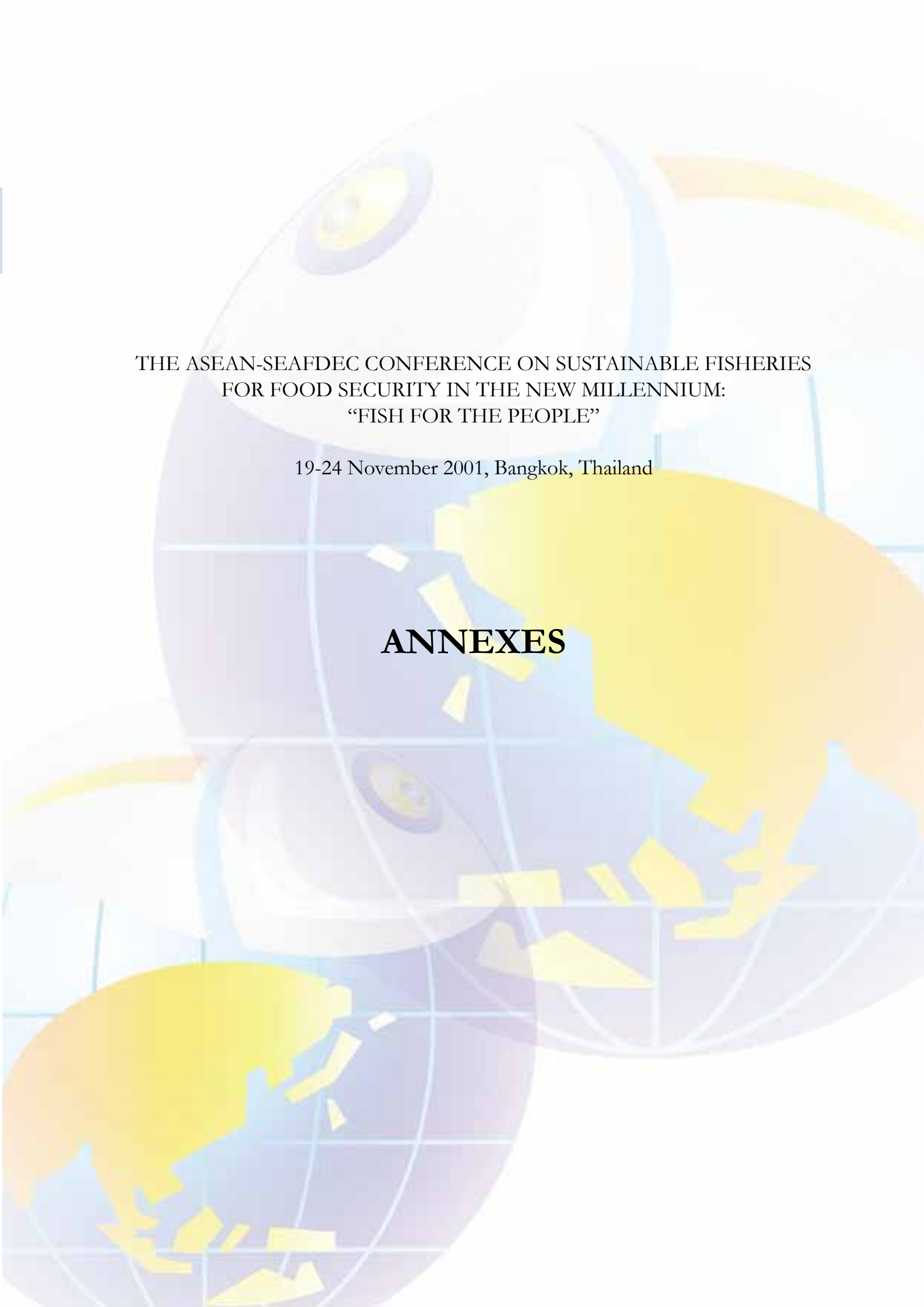
- a) *Request FAO assistance to ASEAN Member Countries in preparing regional guidelines and criteria for eco-label certification of fish products (refer to Eco-labelling 4.6.4.2.II of the Technical Document); and*
- b) *Consider the formation of a regional eco-label technical task force to provide a forum for an exchange of information at a technical level relating to implementation, assessment, and certification processes.*

PLENARY 2: FISHERIES COOPERATION

The following participating organizations presented their policies and programs, stressing the importance of fisheries in the region and their interest in supporting the plans, programs and activities initiated through the Conference process:

- ♦ Southeast Asian Fisheries Development Center (SEAFDEC) *Video Presentation*
- ♦ Asian Development Bank (ADB)
- ♦ Asian Institute of Technology (AIT)
- ♦ Assessment of the Living Marine Resources in Vietnam (ALMRV)
- ♦ Australian Maritime College (AMC)
- ♦ Canadian International Development Agency (CIDA)
- ♦ Food and Agriculture Organization of the United Nations (FAO)
- ♦ International Centre for Living Aquatic Resources Management (ICLARM)
- ♦ INFOFISH
- ♦ Japan International Cooperation Agency (JICA)
- ♦ Japan International Research Center for Agricultural Sciences (JIRCAS)
- ♦ Marine Institute of Memorial University of Newfoundland (MI)
- ♦ Mekong River Commission (MRC)
- ♦ Network of Aquaculture Centres in Asia-Pacific (NACA)
- ♦ Southeast Asian Programme in Ocean Law, Policy and Management (SEAPOL)
- ♦ Swedish International Development Cooperation Agency (SIDA)
- ♦ Tokyo University of Fisheries (TUF)
- ♦ World Trade Organization (WTO)

The full texts of the presentations are provided in *Annex 9*.



THE ASEAN-SEAFDEC CONFERENCE ON SUSTAINABLE FISHERIES
FOR FOOD SECURITY IN THE NEW MILLENNIUM:
“FISH FOR THE PEOPLE”

19-24 November 2001, Bangkok, Thailand

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ANNEX 9
Statements of the International Organizations



STATEMENTS OF INTERNATIONAL ORGANIZATIONS

ASIAN DEVELOPMENT BANK (ADB)

Asian Development Bank Support to Fisheries in ASEAN*

ADB Support for Fisheries Development in ASEAN Member Countries

Fisheries play a very important role as a source of food, employment and export earnings in most Asian countries, and the Asian Development Bank (ADB) has a long history of providing support to the fisheries sector in its developing member countries (DMCs). The first fisheries technical assistance grant was provided to South Korea in 1968, and the first fisheries loan was approved for Taipei, China in 1969. To date ADB has provided 56 loans worth more than \$1.2 billion for fisheries projects in 18 DMCs, which amounts to about 1.4 percent of ADB's total lending.

Since 1970, ADB has approved 32 loans worth about \$852 million to support fisheries projects in six ASEAN member countries, as shown in the summary in Table 1. Of the 32 loans, 25 have had marine fisheries development components, 11 have had aquaculture development components, and 1 was focused solely on freshwater fisheries development. ADB has also provided 46 technical assistance (TA) grants worth about \$13.5 million to these ASEAN member countries – 28 were provided to prepare feasibility studies for loan projects, while 18 were provided to support either advisory services to fisheries departments or operational support to loan projects during implementation. Another 18 regional technical assistance grants (RETAs) worth about \$7.5 million have been provided to support fisheries research, studies and training programs that are either regional in extent or are not country specific. More complete information regarding ADB's TA grants and loans for fisheries projects in ASEAN member countries is provided in Appendix 1.

Table 1. ADB Fisheries Assistance to ASEAN Member Countries

Country	TA Grants	Amount \$ million	Loans	Amount \$ million
Indonesia	19	6.1	13	438.2
Malaysia	8	1.3	3	63.1
Myanmar	1	0.1	3	55.8
The Philippines	10	3.8	7	184.3
Thailand	4	0.5	3	45.1
Viet Nam	4	1.8	3	65.5
Total	46	13.5	32	852.0

Some 25 fisheries loan projects have been completed in the ASEAN countries, while 7 are currently under implementation. Of the 7 currently active loan projects, 4 are being implemented in Indonesia, 2 in The Philippines, and 1 in Viet Nam; and there is 1 new fisheries-related project currently under preparation for implementation in 2002 or 2003 in Cambodia. Of the 25 completed loan projects, 8 were rated as generally satisfactory, 6 as

* Henry Tucker

partly satisfactory and 5 as unsatisfactory; while 6 others were either cancelled or prematurely closed before meaningful results could be achieved and measured. In the early years, fisheries projects were focused mainly on technology and infrastructure improvements in marine fisheries, and on the rapidly expanding aquaculture industry. The success rate of fisheries loan projects across all of ADB's DMCs was relatively low in the 1970s when only 17 percent were rated as generally successful, 33 percent as partially successful, and 50 percent as unsuccessful. However, there was significant improvement in the sector during the 1980s when 65 percent of projects were rated as generally successful, 29 percent as partly successful, and only 6 percent as unsuccessful. This was due to lessons learned from the earlier projects. First is the need to follow a more holistic approach to designing fisheries projects by promoting integrated and sustainable resource management, and not overemphasizing increases in production. Second is the need for more realistic project design parameters, taking into account the resource potential, and the policy framework and institutional arrangements in the country. Third is the need to ensure stakeholder participation in all stages of the project design process to ensure that the project is acceptable to them and meets their needs

ADB Policy on Fisheries

In 1979 ADB formally adopted an initial set of policies or guiding principles, as presented in a staff working paper entitled *Bank Operations in the Fisheries Sector*, for its operations in the fisheries sector. Under these guidelines ADB projects focused on the importance of fish as a high protein food, particularly for lower income groups, and the potential for the fishing industry to contribute to economic growth, provide employment opportunities, and generate foreign exchange earnings for DMCs. Since the late 1980s, ADB support for fisheries and other sectors has increasingly emphasized policy reforms, institutional strengthening, and research and training, and has been very concerned with addressing environmental considerations and promoting community participation. Management systems that would preserve productive fisheries resources for the long term were needed because many fisheries resources already were overexploited and coming under ever increasing pressure due to continuing population growth and the rapid technological advances that were significantly increasing the efficiency of fisheries operations. ADB responded to the changing climate in the fisheries sector by formally adopting *The Bank's Policy on Fisheries* in 1997.¹

ADB's policy is to support national and regional efforts to increase the supply of fish and fish products available for human consumption in a sustainable manner. The primary emphasis is on assisting governments to create appropriate policy, legal and institutional frameworks to optimize fish production, while ensuring that fisheries resources are managed in a manner that will sustain their productivity in the long term. Accordingly, ADB's fisheries investments focus on four areas: (i) supporting the development of a national policy, legal and institutional framework to implement long-term sustainable fisheries management systems; (ii) supporting capacity building for fisheries development and resource management, including human resources development; (iii) creating and strengthening productive capacity, infrastructure and services; and (iv) building regional cooperation in fisheries. ADB project support for sustainable fisheries management systems has included activities to revise fisheries laws, reorganize fisheries departments, and upgrade the skills of fisheries staff. Capacity building activities have included the development of national fisheries databases and information systems, fish stock assessments, public awareness programs, technical and professional

¹ *The Bank's Policy on Fisheries* and other ADB policy papers are available on the Internet at www.adb.org.

training programs for government staff and other stakeholders, the introduction of new or improved technologies, and the supply of necessary equipment. Early projects increased productive capacity by providing credit to purchase better fishing vessels and gear, while more recent projects have focused on improving fish landing facilities, as well as fish processing, storage, transport and marketing operations. Finally, regional cooperation has been promoted through regional technical assistance grants for fisheries studies, research and training programs. Examples include studies on regional fish markets, studies on fish disease and health management, and support for the development and dissemination of genetically improved strains of tilapia for aquaculture.²

The Policy on Fisheries (page 41) states that ADB's operations in the fisheries sector will be guided by five basic principles. First, the Policy states that ADB's strategy for support to fisheries operations will be based on the objectives of sustainability, equity and efficiency. Sustainability is the overriding principle and requires that fisheries development activities do not significantly diminish fisheries resources or productivity, and do not endanger the resources by destabilizing the natural systems of which they are a part. Equity requires that the interests of all of the various competing resource users and stakeholders are addressed so that none is unfairly disadvantaged. And efficiency requires that positive action is taken to reduce waste, for example by improving fishing gears and methods to reduce the unwanted by-catch, or by improving fish processing and storage facilities to reduce product spoilage. One aspect of efficiency improvements entails the elimination of the government subsidies that have often encouraged overcapitalization in fisheries, and facilitating the elimination of excess fishing capacity through vessel retirement programs and training fishermen for other occupations.

Second, ADB actively supports private sector participation in the fisheries sector. It is generally recognized that capture fisheries and aquaculture operations, as well as fish processing, distribution and marketing activities are best handled by private sector enterprises, cooperatives, and individuals. Some ADB fisheries projects have even included loan covenants requiring the privatization of government owned and operated fishing industries, especially fish processing plants and related activities. Within the private sector, conflict between large- and medium-scale commercial fisheries and small-scale artisanal fisheries generally occur in shallow coastal and inland areas, and the protection and preservation of traditional artisanal fisheries is also an important concern for ADB. In many ASEAN countries, large segments of the population routinely engage in fishing for home consumption or as an occasional income-generating activity. This is especially important for many of the poorest people all across Asia who have historically turned to fisheries as an occupation of last resort when food is scarce and alternative employment is unavailable. A recent report by the Mekong River Commission also documented the very important contribution that artisanal fisheries make to child health and development by providing dietary calcium in countries such as Cambodia where milk and dairy products are not a common part of the diet.³

Third, ADB also recognizes that all levels of government also have important roles in helping to manage the fisheries sector. National governments are clearly responsible for providing an appropriate policy, legal and institutional framework to enable sustainable fisheries development. It is also appropriate for governments to undertake monitoring and enforcement activities to ensure that fisheries regulations and restrictions are observed, and to regulate post

² The work on tilapia was conducted by the International Center for Living Aquatic Resources Management (ICLARM).

³ *Catch and Culture*, Vol. 6, No. 4, June 2001.

harvest activities as necessary to protect public health and safety. Government agencies are also generally called upon to collect and analyze necessary data for fisheries management purposes, and to disseminate appropriate information to the public, including market information. In response to widespread over-fishing, governments have been recently called upon to also impose access controls on fisheries that historically have been open access. This is in stark contrast to the common practice in earlier times for governments to heavily subsidize large and medium scale fisheries operations, thus contributing to the current serious problems of overcapitalization in many fishing fleets and the depletion of many commercial fish stocks, resulting in significant inefficiencies in fishing operations.

Fourth, ADB endeavors to take a holistic and precautionary approach to designing fisheries projects by paying special attention to identifying and addressing social and environmental issues. The loan project preparation process is designed to be highly participatory, and employs techniques such as rapid rural appraisals and social assessments, seminars and workshops, and public awareness programs to inform stakeholders about the proposed project and solicit their input into its design. The process identifies important issues such as the need for resettlement that would require in-depth attention during project preparation and implementation. Project preparation also includes the preparation of an initial environmental examination (IEE) to clearly identify potential project impacts, both negative and positive, and appropriate mitigation measures when required. Where the potential environmental impacts are substantial a full environmental impact assessment (EIA) is carried out prior to project approval and implementation.

Fifth, ADB has emphasized the importance of the participation of all stakeholders in the formulation of fishery projects, to ensure that the project outputs address the stakeholders’ needs, and that the project procedures and activities are acceptable to those concerned. The working definition of stakeholders is necessarily quite broad and includes fishermen and fishery related cooperatives, communities, and corporations; riparian communities; concerned voluntary organizations and non-governmental organizations (NGOs), and of course the concerned government agencies (not just the Fisheries Department).

Relevant ADB policies that are also applied during the development and implementation of fisheries projects may include, among others, those on governance, environment (in preparation) private sector development, gender and development, involuntary resettlement, population, and health.

In addition to the above, ADB fully recognizes the global leadership role of the Food and Agriculture Organization (FAO) in fisheries. ADB supports the *Code of Conduct for Responsible Fisheries* adopted by the FAO Conference in October 1995, and the subsequent *Technical Guidelines for Responsible Fisheries*. ADB also supports the *International Plan of Action for the Management of Fishing Capacity*, endorsed by FAO in June 1999, that calls for countries, on a voluntary basis, to assess the capacity of their fishing fleets and then develop plans to manage fishing capacity in a sustainable way. These and similar initiatives will be incorporated into ADB-supported fisheries projects and programs as appropriate.

ADB’s Long-Term Strategic Framework (2001-2015)

The Bank’s Policy on Fisheries naturally has to be interpreted in the context of the full range of ADB policies. In early 1999, poverty reduction was declared ADB’s overarching goal, and the poverty reduction strategy was approved later that year. And in early 2000, the private

sector development strategy was approved to help promote growth to support poverty reduction efforts. The long-term strategic framework (LTSF) for 2001-2015 builds on these two strategies, and provides a clear statement of ADB's strategic goals and fundamental operating principles.⁴ The LTSF identifies three core types of interventions to reduce poverty: (i) sustainable economic growth, (ii) inclusive social development, and (iii) governance for effective policies and institutions. These are complemented by three crosscutting themes to (i) promote the private sector's role in development, (ii) support regional cooperation and integration for development, and (iii) ensure environmental sustainability. When responding to a request from a DMC for support to the fisheries sector, whether in fresh water or salt water, whether for capture fisheries or for culture, and whether for artisanal or large-scale operations, ADB will respond in the context of the LTSF.

ADB is currently preparing the first of three medium-term strategies (MTS), each covering a five-year period, to implement the LTSF. Within this framework, ADB has developed a country strategy and program (CSP) for each DMC to cater to the specific needs and conditions of the DMC while reflecting the operational priorities presented in the MTS. A three-year rolling work plan and budget that identifies the pipeline of future projects for each DMC is updated annually. The CSP is intended to ensure sector selectivity by supporting only a few key sectors in each DMC where ADB is strategically positioned to offer assistance; accordingly ADB will support development in the fisheries sector only where and when it is a DMC priority. Greater DMC ownership of each project will be ensured by increasing the DMC's involvement throughout the project identification and preparation process, under the process of preparing the CSP.

ADB's Future in the Fisheries Sector in ASEAN

Each of the DMCs must establish its own sectoral priorities when requesting development assistance from ADB. However, because many Asian fishermen are poor, and conversely because so many of Asia's poor often rely on fishing to meet their basic subsistence needs, it is logical that certain DMC governments will continue to call upon ADB for assistance to improve the productivity of the fisheries sector. ADB will continue to collaborate with its DMCs, at their request, to design and implement projects to address key issues and problems in the fisheries sector. The country strategy and program (CSP) developed for each DMC is the mechanism by which ADB's strategic agenda will be operationalized at the country level. Experience from past projects has shown that it is extremely important to ensure a strong sense of country ownership for each and every project, and that ownership is best developed through a highly participatory process involving all stakeholders in project preparation. Experience has also shown that fisheries management is more effective when developed as part of an integrated natural resources management system. These lessons will be applied to all fisheries projects proposed in the future.

The days when ADB could support government efforts to increase catches of wild fish stocks by increasing private sector investments in improved vessels and gear are past. Most commercial fish stocks are already harvested at or beyond their maximum sustainable yield. Many fisheries are over capitalized and current fishing technologies and gears are potentially so efficient that targeted wild fish stocks could easily be decimated or destroyed in a very short time. Instead, investments are needed to develop and implement fisheries management

⁴ Asian Development Bank, 2001. *Moving the Poverty Reduction Agenda Forward in Asia and the Pacific: The Long-term Strategic Framework of the Asian Development Bank (2001-2015)*, Manila. (www.adb.org)

plans based on realistic and timely stock assessments and suitable controls on access to the fisheries. The plans will necessarily tend to restrict access to what historically have been open access resources. They will also have to ensure that sufficient inefficiencies are built into capture fisheries operations (through licenses, gear restrictions, area and seasonal closures, size limits, etc.) to ensure that fish stocks are not wiped out, and that adequate escapement regularly occurs for the stocks to remain healthy and productive. DMC governments may request ADB assistance to develop and implement integrated management systems for fisheries and natural resources, including the development of an appropriate policy, legal and institutional framework. Often this would also entail extensive capacity building for stakeholders at all levels from government agencies to fishing communities.

Post harvest losses from spoilage and wastage due to poor fish storage and handling procedures, unsanitary processing conditions, and inefficient distribution networks are still unnecessarily large, estimated at 20 percent or more in some cases. This is often true of fishing operations in the ASEAN member countries, and especially so for the widespread artisanal fisheries generally engaged in by the poor. In such cases a DMC government may seek assistance from ADB to provide basic infrastructure and facilities to reduce waste, such as improved fish landing sites or market access roads. One example of this is an ongoing project supported by an ADB loan and TA to develop or rehabilitating 10 coastal fishing ports in Viet Nam, including the development of port management systems.

Because many wild fish stocks already are fully or over-exploited, as populations continue to grow and incomes rise, the increasing demand for fish and fish products will have to be met through increases in fish culture. While aquaculture is normally a private sector enterprise, there is still room for support from institutions like ADB. The development of homestead fishponds and supporting infrastructure (local hatcheries, etc.) in appropriate environments is one way to directly improve the food self-sufficiency and the quality of the diet for poor rural households.

For each ADB-supported project the proper mix of loan and grant funding needs to be secured. Traditionally ADB loan funds have been used to finance primarily "hard" investments such as infrastructure, while grant funds have tended to be used for "soft" inputs such as consulting services, training and capacity building. However, as grant funds have become scarcer, there has been pressure for the DMCs to agree to finance more of the soft project inputs also with loan funds. ADB also actively seeks opportunities to cooperate with other multilateral and bilateral donors as cofinancing partners to secure the most appropriate financing mix to meet the DMC's project needs.

ASIAN INSTITUTE OF TECHNOLOGY (AIT)

Institute Policy Statement: Asian Institute of Technology*

Introduction

Asian Institute of Technology is an autonomous non-profit institute of higher learning located north of Bangkok, Thailand. Founded in 1957 as the SEATO Post-graduate Institute of Engineering, it moved to its present site in 1973. It has steadily expanded the focus of its activities from the early emphasis on civil engineering to include a broad range of disciplines, including technology, planning and management. AIT's mission has recently been revised and is now

“to develop highly qualified and committed professionals who will play a leading role in the sustainable development of the region and its integration into the global economy.”

Its vision for the future is to become

“a leading and unique regional multicultural institution of higher learning, offering state of the art education, research and training in technology, societal development and management”.

AIT is governed by an independent Board of Trustees, representing a range of stakeholders, including national governments in the Asian region, key donor governments, educational institutions and the private sector. The Institute is not a donor; indeed, until recently it has been heavily dependent for its financial support upon a 3-5 year cycle of grants, including scholarships and faculty secondments, mainly from European donors. In the last several years, sources of funding have diversified somewhat to include wider support from governments in the region, especially Thailand, development project support and self-funding from students in certain fields.

Aquaculture and Aquatic Resources Management is one field of study in AIT. It forms part of the School of Environment, Resources and Development, which is the largest of AIT's four schools. Aquaculture and Aquatic Resources Management (AARM) has been in existence in one form or other since 1982 and has developed from an original specialism in aquaculture. Like most fields in AIT, AARM operates an academic program at Masteral and Doctoral level, as well as being involved in short-course training, research and consultancy services. Perhaps uniquely in AIT, AARM has also has a major outreach program which emphasizes capacity building of national institutions working in aquatic resources development and management, with particular reference to poverty and the environment. AARM's Mission closely follows that of AIT,

“AARM is committed to improving regional institutional capacity in aquaculture and aquatic resources management and related fields, through innovative approaches that integrate education, research and development.”

As such, it is obvious that AARM seeks to co-operate with a wide range of national and regional institutions, as well as international donors and developed country research institutions. In the latter context, like AIT, AARM sees itself as a hub to assist in the channeling of support for more relevant research and development initiatives to its regional partners.

* Prepared by Dr. Harvey Demaine, Co-ordinator, Aquaculture and Aquatic Resources Management, Asian Institute of Technology, Bangkok, Thailand

AARM's Current Activities

(a) Academic Program

AARM's traditional core activity is its academic program. It offers two main programs:

- (i) a 5-term 20-month M.Sc. course, consisting of three terms of course work and, under the thesis option, two terms for research. This may be carried out on campus or, increasingly, in the student's home country. The intake in a typical year is currently between 12-20 students, depending on the availability of scholarships. Traditionally the AARM M.Sc. program has attracted a wide range of nationalities, including Thailand, the Philippines, Indonesia, Vietnam, Sri Lanka, Bangladesh, India, China and Nepal, but in recent years the intake has been dominated by students from Vietnam, Cambodia, Thailand, Bangladesh and the Lao PDR, because of the concentration of donor-funding on those countries.

M.Sc. students enter three possible specializations, in which the course offerings vary to a greater or lesser degree:

- ♦ Aquaculture Technology, traditionally oriented towards low-cost, small-scale inland aquaculture, but with increasing emphasis on the more commercial sector in both inland and coastal aquaculture and on key areas such as seed and hatchery development and genetic-improvement and applications
- ♦ Aquatic Resources Planning and Management. This specialization combines aquaculture technology for small-scale farmers, with management of small-scale aquatic resources for rural poor people. It is oriented mainly to public sector officers engaged in development and promotion of aquatic resources management in the broadest sense, and stresses a bottom-up, participatory approach.
- ♦ Integrated Tropical Coastal Zone Management. This is an interdisciplinary specialization in AIT, in which AARM is the core field. The program encourages an holistic approach to the complex problems of managing the sustainable development of coastal zones, including coastal aquaculture and fisheries, but including a range of other issues such as tourism, rapid urbanization and industrialization, biodiversity and conservation.

- (ii) Doctoral Research

AARM also supports Doctoral studies across the same range of specializations. At any one time between 10-15 Doctoral students are enrolled.

The academic program is supported by well-equipped laboratory facilities, an extension range of pond and hatchery facilities and an information services unit, through which it is hoped to encourage more innovative learning approaches amongst AIT's students. It also publishes a quarterly newsletter covering the range of AARM activities and is being developed as a regional information centre for the wider community. Such services can be accessed through AARM website.

(b) Short-course Training

Alongside its academic program, AARM has a dedicated short-course training unit. This was developed almost a decade ago in response to demands from the Peace Corps and from projects in Bangladesh for technical training in aquaculture technology, especially culture and seed production of

tilapia. A series of standard courses were often for several years, but today the demand has become more specialized and the Training and Consultancy Unit designs tailor-made courses, as well as offering study tours to key contexts in Thailand. AARM also has the advantage of an extensive network of national institutions in the countries of Indochina (see below) and study tours and specific training can sometimes be arranged through its partners.

(c) Research

Research is a necessary complement both to an up-to-date and relevant teaching program and as an input to the outreach activities, which are described below. AARM has been involved in research in tropical aquaculture for almost 30 years, initially within the field of environmental engineering on the feasibility of aquaculture to treat and reuse sewage. Since then the range of research conducted has evolved steadily and has changed over time. Research is carried out both by faculty members and research staff, as well as by students in their thesis work.

Until the early 1990s, the concentration was on two major themes: sewage-fed aquaculture; and semi-intensive or low-cost, low-input inland aquaculture. Research took place both on campus and on-farm. Initially research was typically researcher-driven, but latterly considerable emphasis has been placed on adapting technologies to farmers' needs through field survey and appraisal and on-farm trials, managed by farmers. In terms of species, there was a high concentration on tilapia and silver barb as species most favoured by small-scale farmers. Topically, the main emphasis was on pond fertilization and the production of natural food through a range of pond inputs; attention was also given to use of low-cost supplementary feeds, a range of which were tested over time. Inevitably such foci led to examination of the role of integration between agriculture and aquaculture, although results in this regard were generally disappointing at farm level because of the shortage of nutrients and poor overall economic returns. Details of the results of the wide range of experimentation conducted can be found in journal articles, working papers and in AIT (1994)

In the last decade, there has been considerable diversification in the research profile at AIT. Today there are five major research themes:

- ♦ Small-scale aquaculture
- ♦ Seed production and genetics
- ♦ Regional education
- ♦ Small-scale fisheries
- ♦ Coastal zone management & the environment

Most of the work in the last three themes is conducted in association with outreach activities (see below). Work in small-scale aquaculture has moved into more intensive systems, based upon pond fertilization studies. Much of this work has been conducted under the collaboration with the Pond Dynamics/Aquaculture Collaborative Research Support Program, funded by USAID. Experimentation conducted during 1996-2000 concentrated on research on pond production systems and environmental impacts. Most of the research has been focussed on improving efficiency in pond production systems. To that end, experiments were conducted evaluating supplemental feeding and maximum stocking densities suitable for tilapia production, on tilapia-based polyculture systems and the effects of turbidity and turbidity mitigating techniques on production. Another series of experiments evaluated nitrogen fertilization rates for maximal fish production as part of a global experiment.

The other major area of research under CRSP on environmental impacts of aquaculture has concentrated around pond draining and flushing of sediments into natural water systems. The first series of experiments evaluated various means of draining ponds and harvesting fish to minimize environmental impacts. A second experiment then evaluated the effect of incomplete draining on future grow-out of tilapia. A final study on environmental impact looked at the relationship between intensive catfish and tilapia production. In this experiment, catfish ponds were fed intensively with artificial feed and the effluents from these ponds were sent to tilapia ponds as fertilizer. In this case, there was very rapid catfish growth in the fed ponds and tilapia growth in ponds receiving catfish effluents.

The outputs of CRSP research have been fed into AARM outreach activities. Until 2002, much of this work was based in Northeast Thailand. Local officials were trained in pond fertilization technology derived from the on-campus research and a series of on-farm trials carried out. The farmers did not directly adopt the technology, but in virtually all cases, the farmers' experienced a substantial increase in fish yield associated with green water technology. In the latest round of CRSP research, most of the work is being conducted in association with regional partners in Bangladesh, Nepal and Vietnam.

Research work on seed production and genetics began as long ago as 1984 with a project on mass seed production of tilapia and development of sex-reversal techniques for this species. This was followed by work on nursing techniques to improve survival rates of fry and on feed for nursing. More recently, studies have widened to examine the broad issue of seed quality in relation to broodstock management, hatchery management in general and the seed distribution system. State of the System reports have been published for Bangladesh, Thailand and Vietnam.

AIT has become renowned as a centre for the production and distribution of high quality fry and broodstock of tilapia; indeed it can be said to be the centre of Thailand's tilapia industry. More recently, with the support of DfID's Fish Genetics Research Program, this work has been complemented by research activities on genetically male tilapia (GMT). On this basis, AARM has begun to expand its activities in genetic applications in aquaculture. A major project is underway on the genetic status and improvement strategies for exotic carps in Asia, while there is also collaboration with the Mekong River Commission in the use of genetic markers to track fish migration. With other programs in AIT, AARM is seeking to develop an academic specialization in this field.

(d) Outreach

Out of AARM's early work in technical research for small-scale farmers has grown its extensive Outreach program. This was established in 1988 as an adaptive research project oriented towards establishing appropriate technologies for small-scale farmers in Northeast Thailand. This project has gradually developed to a multi-donor program for capacity building in education and training, research and development, with national institutions in Cambodia, the Lao PDR, Thailand and Vietnam. Funding is currently provided by Sida, Danida, DfID and the EU (under research projects in partnership with the University of Stirling) and ICLARM. Partner institutions include universities and agricultural colleges, departments of fisheries and research institutes.

The Outreach program has developed approaches to capacity building which stress learning together with the partner institutions on how to address the problems of small-scale farmers and rural communities in the development and management of aquatic resources. The initial

stress on a farming systems research methodology have given way to more participatory approaches, particularly for community-based aquatic resources management. The experience gained in the original pilot projects in each field site are increasingly being translated to other similar contexts, especially through horizontal networking between provincial and district officials. Development of sub-regional networks has become a major objective of program activities and most recently AARM has tried to draw its partners together into an "Institutional Network" with a view to initiating joint activities between the four countries. AARM tries to facilitate channeling resources to its partners and helps to co-ordinate the activities of different projects.

This same networking role is being developed by the Integrated Tropical Coastal Zone Management specialization. This recently held (October 9-10, 2001) what was termed a 'twinning workshop' to exchange information and initiate possible co-operation between a range of regional (including SEAFDEC) and national institutions in Thailand, Vietnam, Indonesia, the Philippines, Cambodia and Bangladesh on the one hand and collaborators from Denmark and Sweden on the other.

Future Areas of Collaboration

AIT's AARM Program wishes to build on these existing areas of collaboration. As noted above, AIT's Mission is to serve the development of the Asian region and geographic proximity means that a major concentration will be on the ASEAN region. AARM seeks to continue its traditional services in postgraduate education and training for the region, but with a changing emphasis on:

- ♦ Interdisciplinary degree programs, combining aquaculture technology and the biophysical environment with socio-economics, planning and management. This thrust is exemplified by the new specializations in Aquatic Resources Management and Integrated Tropical Coastal Zone Management
- ♦ More flexibility degree programmes whereby participants can select modules from a range of courses according to their needs, in which qualifications can be built up over a number of changes and in which at least some courses can be taken in a distance learning mode. AARM hopes to complete an initial modularization of courses by the beginning of 2003
- ♦ These modular courses will also be available to short-course training participants
- ♦ Collaboration with national and regional education providers in development of teaching materials which can be used in national universities and for distance education courses. These teaching materials may include case study materials drawing on local examples. Already a proposal has been placed before and has been considered by the ASEAN Ministers of Agriculture to this end.

AARM also wishes to expand its research and outreach activities in the region. New research thrusts have been outlined above. It is intended to expand the work in genetic applications in aquaculture and there are aspirations to develop a thrust in fish nutrition studies. Through Sida funding of Outreach and through the CRSP, AARM will continue to work in developing new technologies and development approaches to small-scale aquatic resources management, especially wetlands management in Cambodia, the Lao PDR, Thailand and Vietnam. Funding is secured for these activities until 2004. However, AARM seeks opportunities to expand its work

- ♦ in the freshwater sector to Myanmar, as well as in South Asia (Sri Lanka, Nepal and possibly Bangladesh)
- ♦ and in the coastal zone, through initiating pilot projects with national partners in the several target countries mentioned.

AARM also seeks to expand its role as a service centre for the region in two other areas:

- ♦ Information services. AARM will continue to publish its regular newsletter, but will also expand activities in provision of information through computerised databases of materials available in house or through regional links. With CAB International, it hopes to co-ordinate the preparation of a compendium on tropical aquaculture.

Consultancy services. AARM believes it has a core of expertise and a network of contacts which enables it to offer advisory services to regional governments across a range of issues. Already several key projects in Vietnam and Bangladesh have been utilising those services.

Reference

AIT (1994) *Partners in Development: The Promotion of Sustainable Aquaculture*, Bangkok

ASSESSMENT OF THE LIVING MARINE RESOURCES IN VIETNAM (ALMRV)

Assessment of the Living Marine Resources in Vietnam: Strategy and activities*

Introduction

The Assessment of the Living Marine Resources in Vietnam (ALMRV) is a sub-component of the Fisheries Sector Programme Support implemented by the Ministry of Fisheries (MOFI) with the assistance of the Danish Ministry of Foreign Affairs (Danida).

The first phase of ALMRV was completed between 1996 -1998. The present and second phase (ALMRV II) started in 1999 and is scheduled to last for 5 years.

Despite its name, and in contrast to the first phase, ALMRV II aims at assessing the fishery systems as a whole rather than the living resources alone. In other words, the economic performance of the fleets, the social aspects of the fishing communities as well as resources are taken into consideration in the analysis.

The multidisciplinary approach is reflected in the three objectives of ALMRV II:

1. Support establishment of a multidisciplinary information base to monitor and assess Vietnamese marine fisheries;
2. Improve multidisciplinary research in fisheries management;
3. Strengthen multidisciplinary fishery management advisory capacity within MOFI.

The following paragraphs give a brief overview of the activities supported by ALMRV II.

Establishment of a multidisciplinary information base.

To strengthen the fishery information base (objective 1), ALMRV II supports implementation of a number of routine data collection programmes covering the resources, fisheries and fleet structures as follows:

Resources:

- ♦ *Scientific survey programme (RIMF).*
Biological resource surveys are carried out with commercial fishing vessels and scientific research vessels targeting the major species and stocks.
Output:
 - Resource distribution and abundance indices
 - Biological stock and species characteristics

Fisheries:

- ♦ *Enumerator programme (MOFI/RIMF).*

* Pham Thi Duyen Houg¹, Nguyen Thi Dieu Thuy¹, and Steen Christensen²

¹Research Institute of Marine Fisheries, Haiphong, Vietnam

²Ministry of Fisheries, Hanoi, Vietnam

In each of the 28 coastal provinces enumerators from provincial Fisheries Resource Protection Departments carry out daily interviews with fishermen. Nationwide, every month more than 1600 interviews are carried out on the performance of the most important fleets.

Output:

- By trip: catch, effort, cost and earnings.

- ♦ *Logbook programme (RIMF).*

The logbook programme covers the most important offshore fleets. In 2001 about 100 vessels from 5 different offshore fleets in 4 provinces were included in the logbook programme giving detailed fishing information from a total of about 12000 fishing days.

Output:

- By fishing operation: total catch, catch composition, fishing effort, fishing area
- By trip: costs and earnings.

- ♦ *Observer programme (RIMF).*

The observer programme, where scientists are on board the fishing vessels for a whole trip, covers the most important offshore fleets and support validation and analysis of the logbook data.

Output:

- By fishing operation: total catch, catch composition, fishing effort, fishing area,
- By trip: costs and earnings

- ♦ *Economic data collection programme (IFEP).*

To get a better understanding of the economic performance of the different fisheries, specific economic surveys are implemented targeting the same fleets as are included in the enumerator, logbook and observer programmes.

Output:

- By year: fixed costs, maintenance costs, fishing behaviour.

Fleet structure

- ♦ *Vessel register programme (MOFI).*

The vessel register programme supports the establishment of a database of all licensed fishing vessels in Vietnam.

Output:

- By province: capacity

Multidisciplinary research in fisheries management

To strengthen the multidisciplinary research (objective 2) ALMRV II supports a number of research activities with participation of both biologists and economists. Presently the research projects are focused on 3 main topics:

- ♦ *Bio-economic impact of catching juvenile fish*
- ♦ *Bio-economic impact of light fisheries*
- ♦ *Species composition and catch value of key species in the trawl fisheries*

Flow of Information

The comprehensive and detailed data from the marine capture fisheries data collection programmes are validated and stored in specialist databases that are the basis for annual assessments updating biological, social and economic indicators monitoring the resources and the performance of the fleets. Subsequently, aggregated data from the data collection programmes and the results from the multidisciplinary research projects are submitted to a Fisheries Management Information System (FMIS) in MOFI together with data from other areas of the fishery sector, aquaculture, production, environment etc.

For example, data from the logbook and observer programmes are stored in specialist databases in RIMF and data from the economic data collection programme are stored in IFEP located in MOFI, Hanoi. The data collected by the enumerators at the provincial level have so far been transferred by mail to RIMP where they are entered into the database (Vietfishbase) by encoders. It is the intention from January 2002 that the enumerators will enter the data themselves and on a monthly basis make an electronic file transfer to MOFI where the national specialist database will be located. In MOFI the enumerator data from all the provinces will be validated before merged into the national database at regular intervals.

After assessment, relevant management information e.g. updated time series of total catch and income indicators will be submitted to the managers at the relevant management level, national, central or provincial so that they can be included in the management considerations at the appropriate level.

Although the data entered into the specialist databases may come from many different levels, all changes to the database are made at the central level. Updates of the database structure and relevant subsets of the specialist databases (e.g. Vietfishbase) will regularly be transferred from the central level to the management levels (e.g. the provincial) for their further use.

The enumerator database procedures as described above, may seem meticulous but this is considered necessary to ensure that there is only one master database.

Strengthening multidisciplinary fishery management advisory capacity within MOFI

To strengthen the multidisciplinary fishery management advisory capacity (Objective 3), ALMRV II gives support to an advisory group that has been appointed by MOFI. Each of its 11 members represent one of the major information flows in the fishery sector. The objective of this group is to provide multidisciplinary fishery management advice to managers/ministers in MOFI taking into consideration economic and social objectives and biological and technical constraints. This group is supported by specialist teams and will base its recommendation on information from FMIS, relevant research reports and additional analysis of data from the specialist databases if so required.

Presentation of results

There are several ways the data could be presented to the managers. It could be in the form of resource profiles by abundance indices from the surveys or catch rates from the enumerator programme as indicated in Figures 1, 2, and 3 for otter trawl at different management levels (national, regional and provincial).

The aggregated catch rates may be compared to value per effort unit (Figure 4) or the catch rates could be split into different ecological groups, e.g. fish and shrimp as indicated in Figure 5.

The Figures 1 – 4 indicate that at all management levels the catch rates for otter trawlers have been constant except for the large HP groups (HP>90) that have had a slight increase. However, as indicated in Figure 4, the value per fishing day did not increase for any HP group and Figure 5 indicates that there has been a change in the catch composition with the proportion of shrimp decreasing and the proportion of fish increasing.

Another way to present the information from the enumerator database could be in the form of fishery profiles at the different management levels (Figure

Collaboration in the future

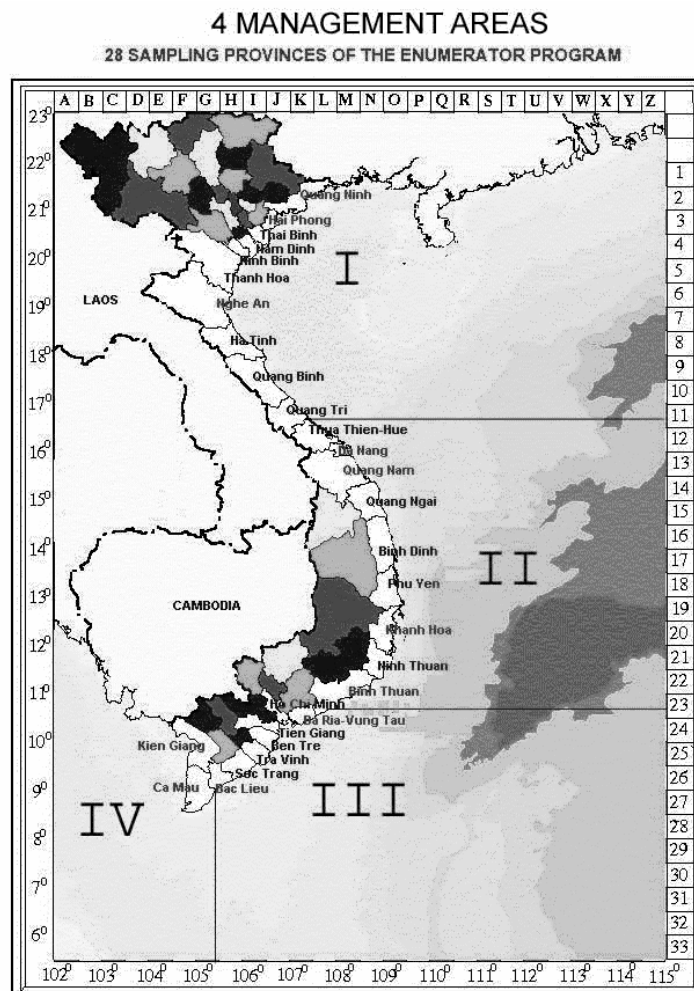


Figure 1: CPUE for otter trawl fleets (four different HP groups) at national level

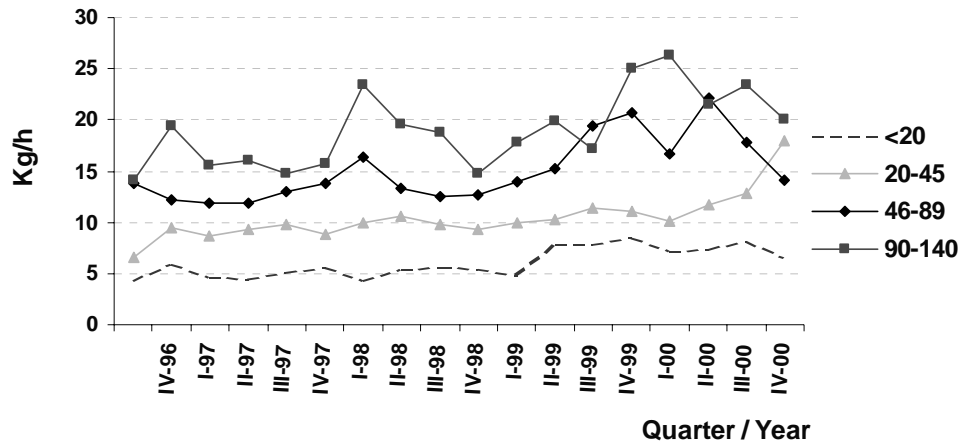


Figure 2: CPUE for otter trawl fleets (four different HP groups) in Southeast Management area

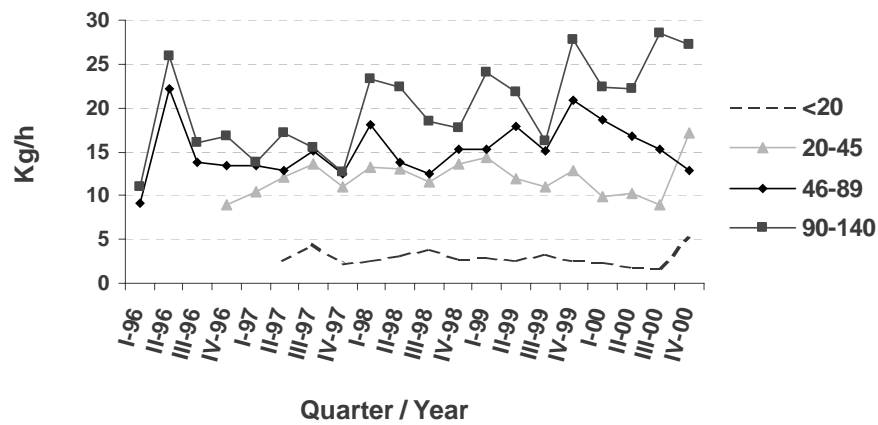


Figure 3: CPUE for otter trawl fleets (four different HP groups) in Bac Lieu province (within southeast management area)

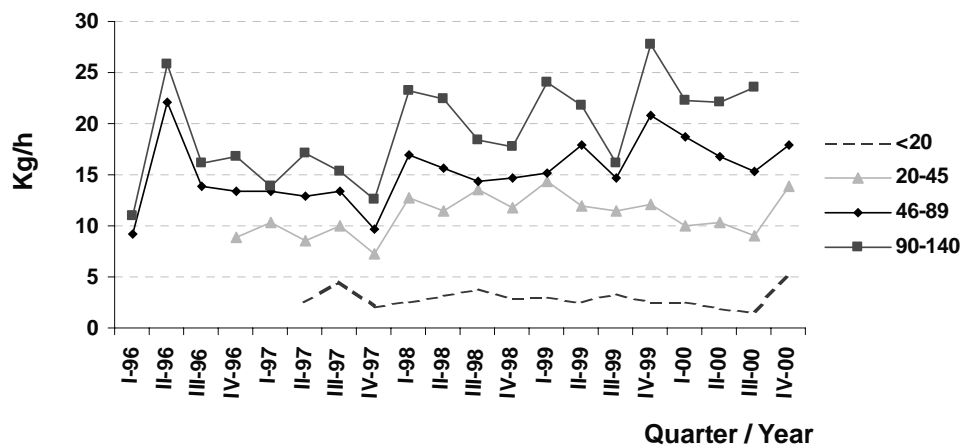


Figure 4: Catch rates and value per day of four otter trawl fleets (four different HP groups) in Bac Lieu province (Southeast management area)

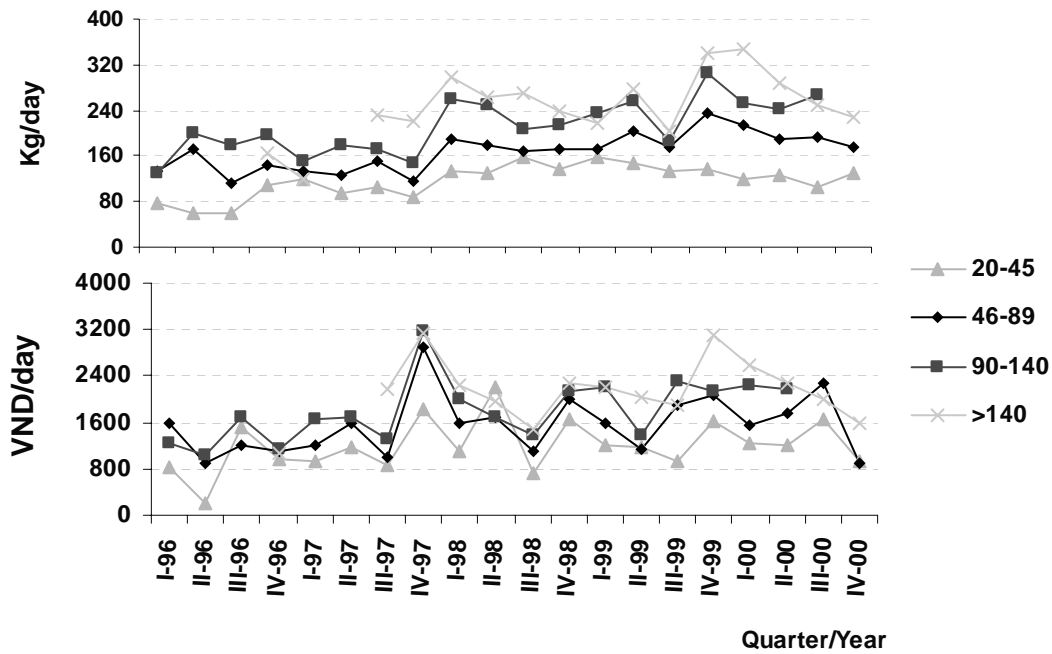


Figure 5: Proportion of shrimp (upper panel) and fish (lower panel) in otter trawl catches (4 HP groups) in Bac Lieu (Southeast management area)

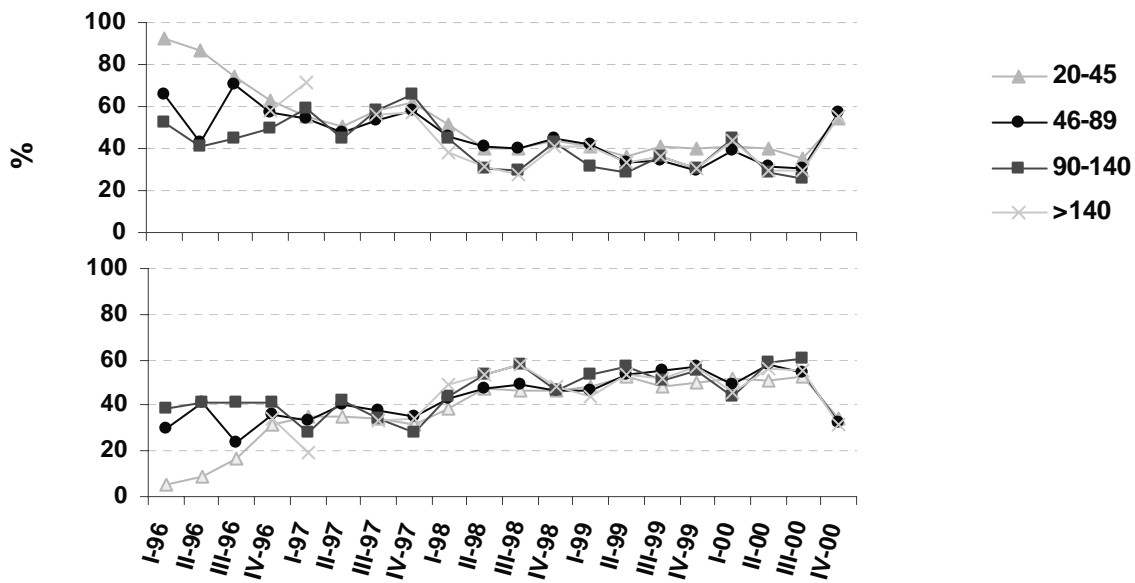


Figure 6: Contribution of important commercial groups to important fleets at national level

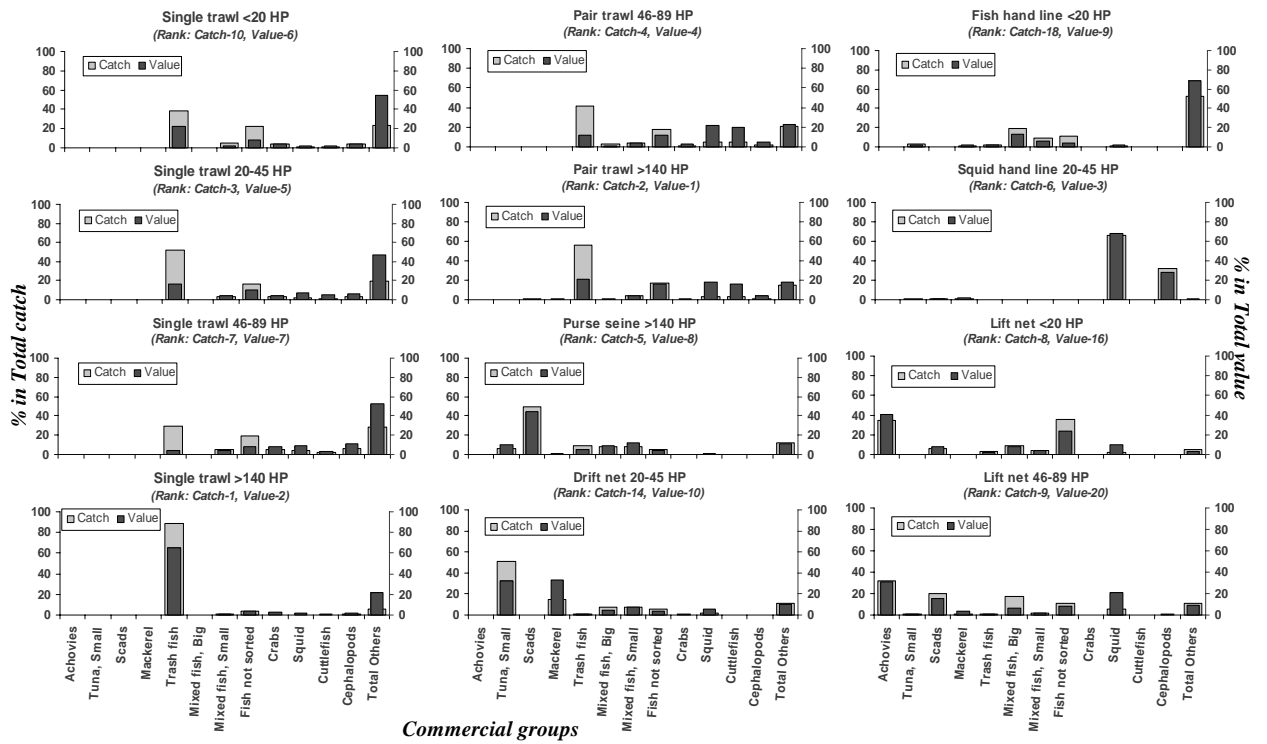


Figure 7: Contribution of important fleets to important commercial groups at national level

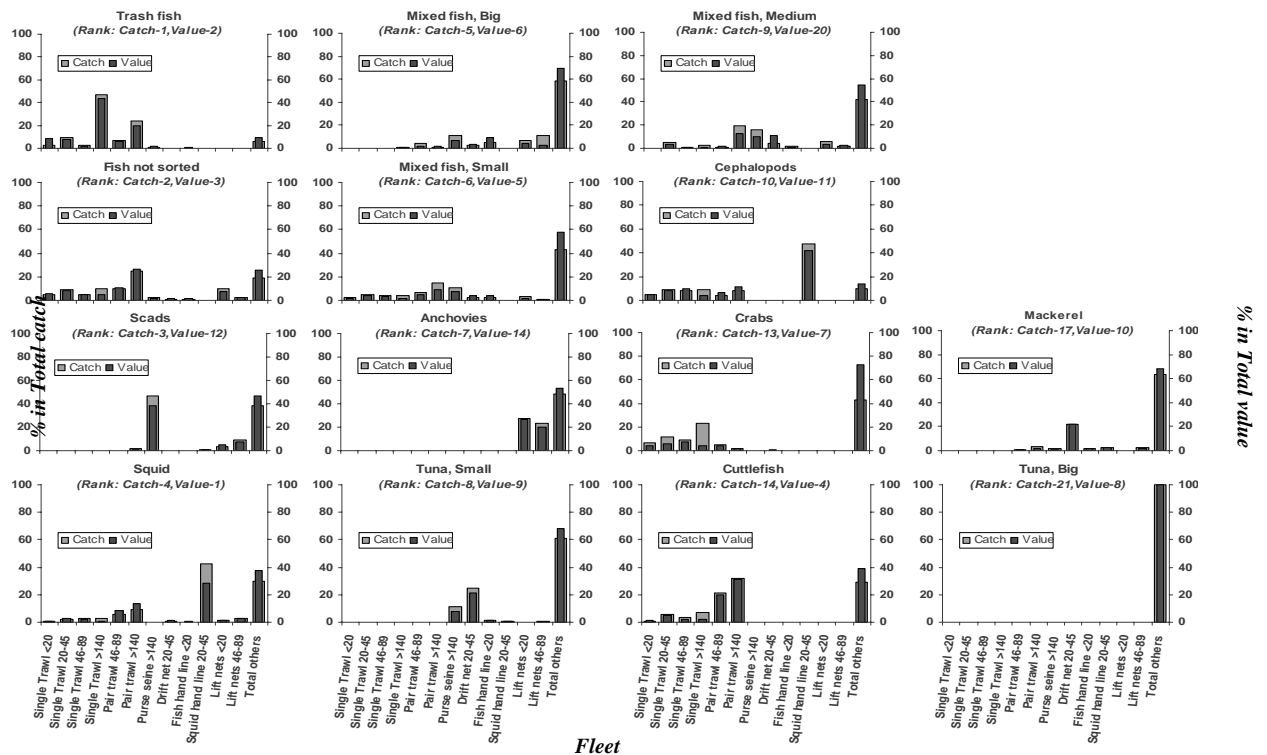


Figure 8: Contribution of important commercial groups to important fleets -Southeast management area

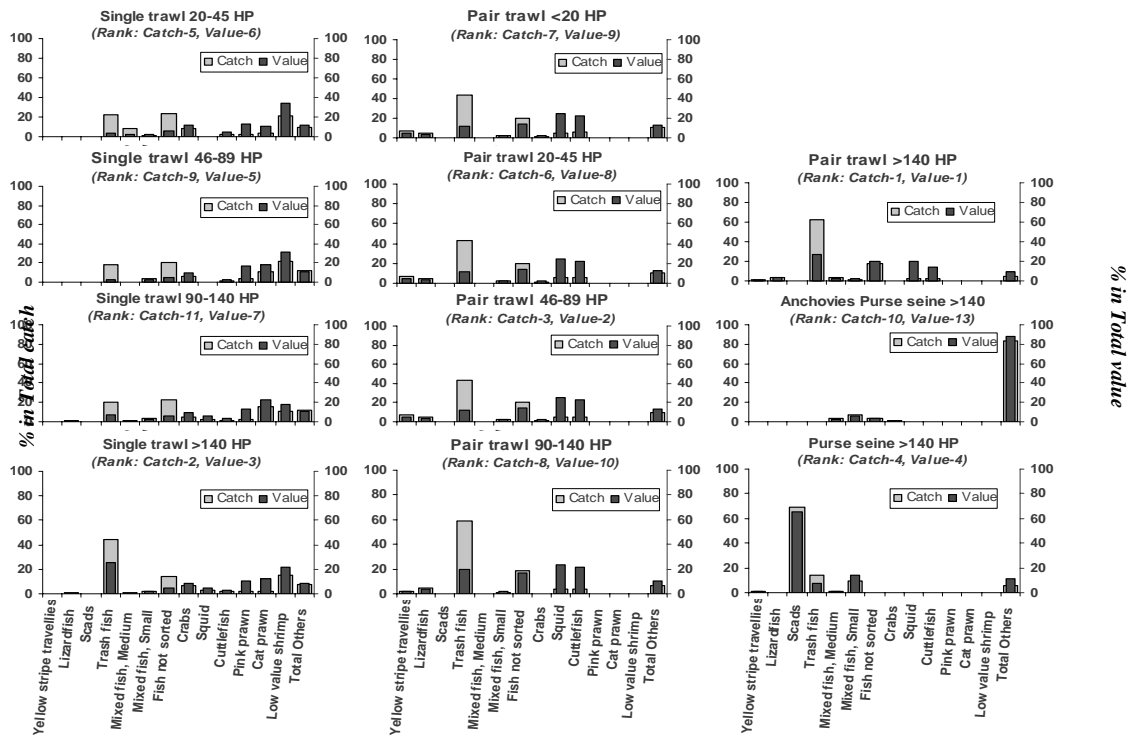


Figure 9: Contribution of important fleets to important commercial groups - Southeast management area

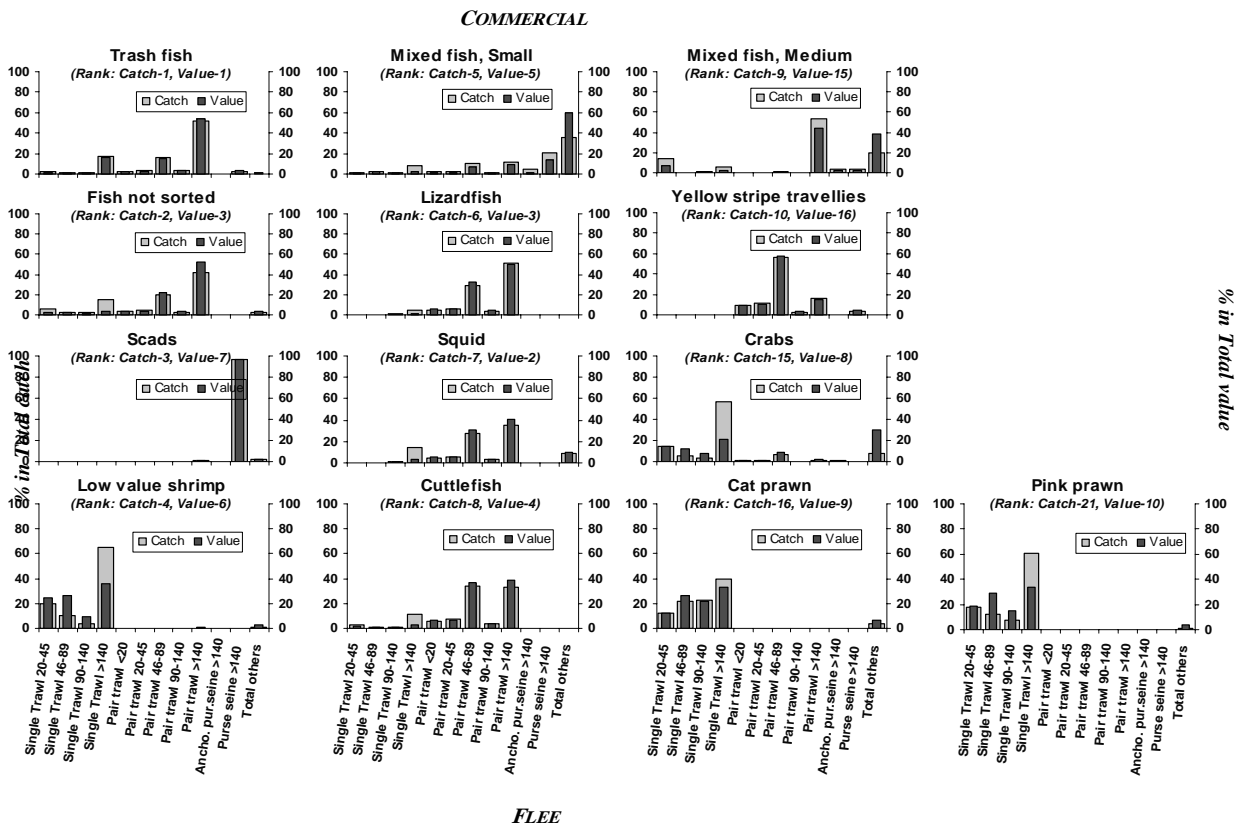


Figure 10: Contribution of important commercial groups to important fleets-Bac Lieu Province

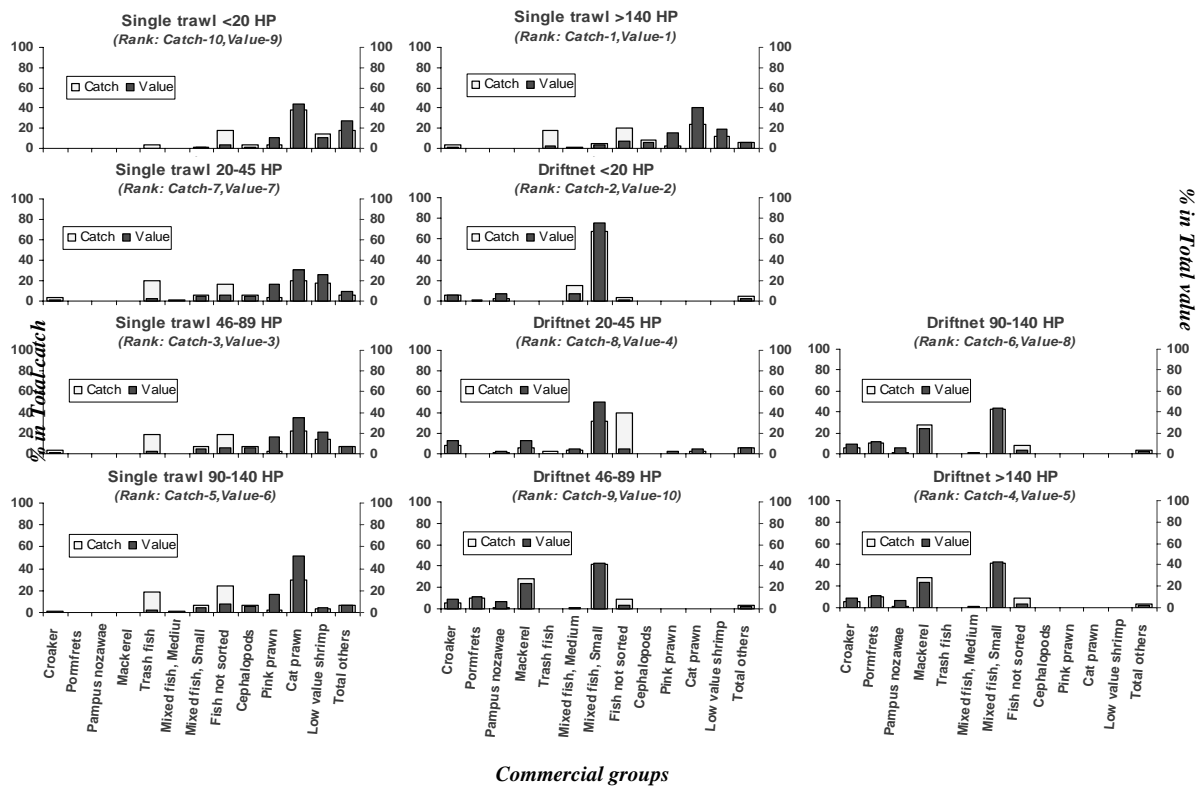
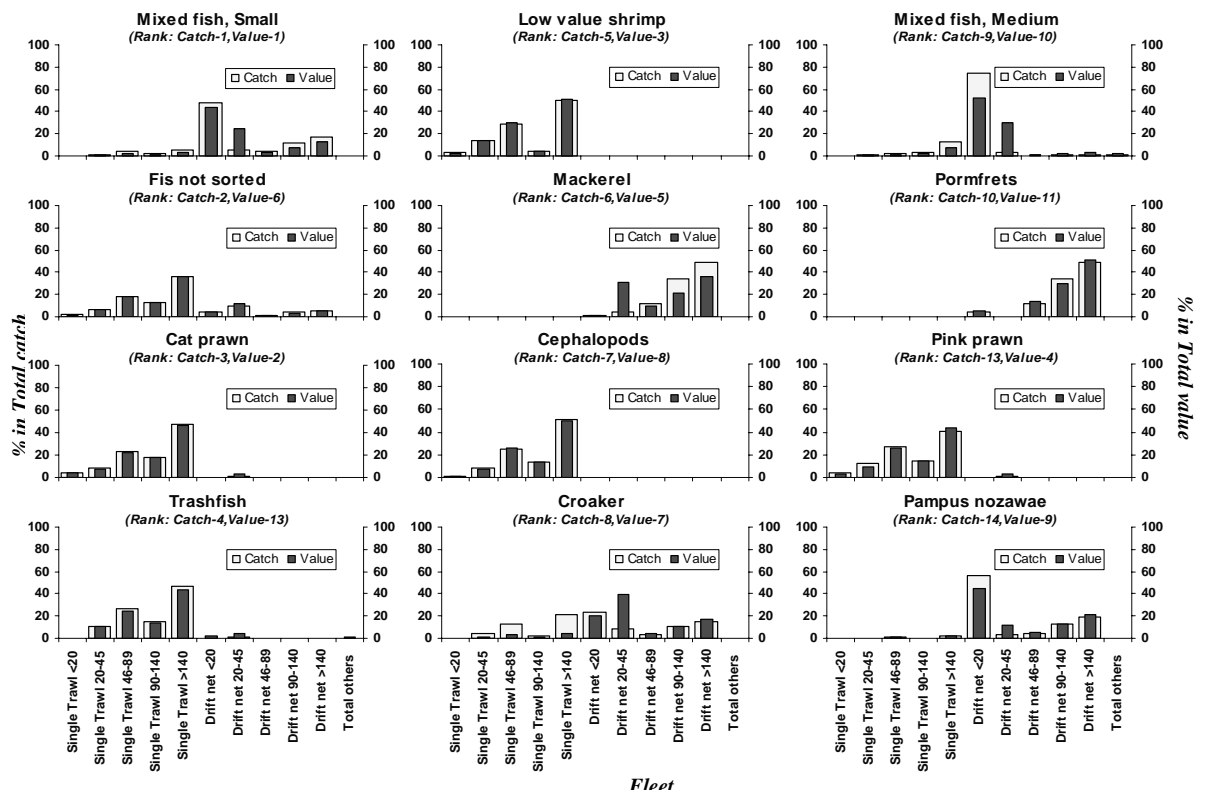


Figure 11: Contribution of important fleets to important commercial groups –Bac Lieu Province



AUSTRALIAN MARITIME COLLEGE (AMC)

A Professional Development Programme for Fisheries Managers in the ASEAN Region *

“Cheat the earth...
Earth will cheat you”
Chinese Proverb

Introduction

Traditionally the oceans and their resources have been regarded as common property with access to all. It is often argued that such free and unrestricted access will eventually, with ever increasing effort, lead to overexploitation - the so-called “tragedy of the commons”. Fisheries management and administration relates to the regulation of man’s access and impact to aquatic resources it also relates to balancing interests of other stakeholders in the use of the resource or area in question.

Contemporary literature on fisheries management, in the main, focus on methods of managing commercial fisheries, often on output controls and the shift to privatisation. Yet most of the real fisheries management issues lie in or adjacent to the coast, involve subsistence and or artisanal fisheries and have a focus on short term food security. The literature is not vast in how to deal with these critical issues.

One needs to view this reality with the emerging international trends to large system planning and management – the integrated approach, and the promotion of stakeholder and communities in the management process. It is this apparent that the modern fisheries manager faces many international and domestic pressures and needs expertise that transcends the fisheries sector and take into account the social, economic and ecological policy demands.

We argue the issue revolves around managing the interaction of man on the resource and the environment, not the management of the resource *per se*. The Australia Maritime College has thus developed a series of educational products aimed at equipping contemporary fisheries managers with the skills to really address the pressing issues of inshore fisheries management and we have focused our research effort on developing methods to mitigate adverse and unsustainable environmental impacts of fishing.

Education and Professional Development

The contemporary setting for Fisheries Managers is one where managers need to possess a variety of high level capacities in the following core areas:

Leadership

Strategic Management

Sustainability

Conflict Analysis and Management

* Marc Wilson

AMC’s Marine Policy programme has developed a set of programmes at Undergraduate and Graduate levels to provide graduates with the skills required to provide leadership and management in the Fisheries sector.

Graduate School of Marine Resource Management

The Graduate School of Marine Resource Management has established an MBA programme that enables the participant to specialise in their area of interest but still requires participants to undertake core units that will develop knowledge and skills in the core MBA areas.

MBA Marine Resource Management Structure

Participants can choose to either enroll directly in an MBA and pursue topics of interest or follow a path of specialisation through a Graduate Certificate, Graduate Diploma through to the. The eight specialisations available are:

1. Fisheries Management
2. Coastal Management
3. Offshore Resource Management
4. Seafood Management
5. Coastal Community Management
6. Environmental Management
7. Aquaculture Management
8. Aquatic Resource Administration

Students must complete 12 units including 6 core specialty units plus a dissertation to qualify for the MBA Marine Resource Management (Figure 1).

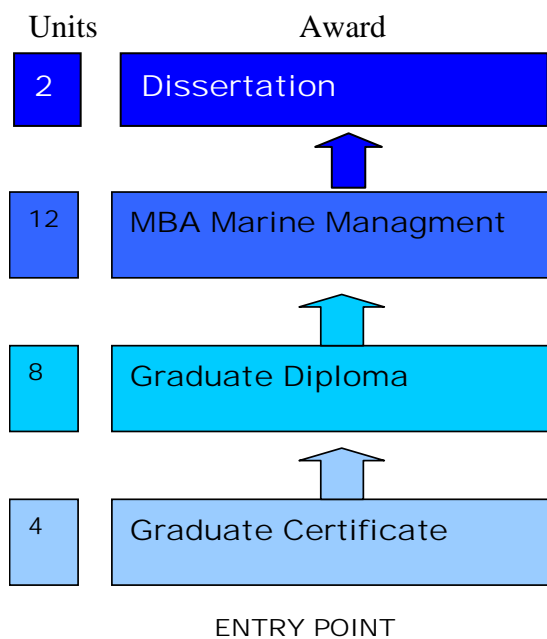


Figure 1 MBA Programme Articulation.

Students undertaking these specialist streams must undertake a study programme that provides a mix of appropriate specialisation but also an opportunity to choose electives from other areas within the Marine Resource Management Programme (Table 1)

Table 1 Graduate School Marine Resource Management MBA Programme Subjects

Aquaculture Policy and Planning	Coastal Zone Management
Economic Applications	Ecosystem Effects of Fishing
Environmental Policy	Environmental Law
Environmental Management Systems	Financial Management
Fisheries Management	Indigenous and Customary User Issues
Seafood Marketing	Oil, Gas, and Offshore Mining
Organisational Behaviour	Recreational Fisheries Management
Aquatic Ecotourism	Social Impact Assessment
Seafood Safety and Quality Assurance	Stock Assessment for Managers
Strategic Management	Fisheries Biology and Ecology
Fisheries Surveillance and Compliance	Information Processing
Sustainable Fishing Practices	Introduction to Law
Vessel Operations and Seawork	Aquaculture Production Systems
Aquaculture Species Biology and Ecology	Aquaculture Health Management
Awareness of the Aquatic Environment	Administrative Law

The Enabling Environment for Professional Development

Managers or prospective managers wishing to pursue further professional development are often already overworked and over committed. The difficulties faced by participants is not primarily an academic one, rather, they revolve around priority setting and time management. Participants are unlikely to be able to attend residential programmes. Participants require flexibility in all aspects of the delivery from enrolment right through to assessment requirements.

ASEAN member fisheries agencies face the triple negative to developing agency competency ie they have less funds, less staff and increased work loads. Within this environment the agency needs to develop the professional expertise of its staff. AMC has recognised this in designing its MBA programme. By providing distance, in-region intensive short courses and residential options AMC provides students and government agencies with a professional development programme that can be undertaken entirely whilst in full time employment or with a number of residential options.

Another relevant aspects is that the dissertation must be undertaken on a workplace related topic. This has the dual benefit of providing the gency with an opportunity to research and report on a area or topic of interest or importance to it and provides that students with a relevant career shaping area of expertise.

Any distance education programme, be it on-line or distance, needs to be able to maintain motivation through the provision of contemporary, relevant and interesting material and enable participants to make significant progress towards their professional development goals.

The MBA *MRM* achieves this by offering three semesters per year with a wide and diverse electives. It also offers one week intensive learning courses throughout the year, in topics of high contemporary interest eg Ecosystem Effects of Fishing, Fisheries Surveillance and Compliance etc. This enables participants to gain four units per year or a postgraduate certificate in 12 months whilst working full-time. The added advantage of the intensive short courses is that it establishes participant networks and enables us to include team exercises in the distance material. The team exercises/activities provides peer pressure which is a significant motivator similarly the networks allow the development of a virtual mutual support network.

ASEAN Member Countries Initiatives

AMC has through its MOU with SEAFDEC been exploring the development of a series of in region professional level intensive short courses that would be credited towards the MBA programme and thus facilitate the entry of fisheries agency staff into the programme.

Discussion

Marine resources are a mosaic of "rights" (property rights, fishing rights, mining rights, use rights etc) and values (aesthetics, the outdoor experience, the quality of the environment etc), and usually involve common property resources. As a result almost any significant development of the coastal or offshore zone, be it for, mining, tourism, harbours, aquaculture, fishing, the coastal sprawl etc is likely to infringe on the rights and values of others and lead to conflicts.

Sustainability is the guiding principle for renewable resource management fisheries managers need to manage fisheries with a view to achieving the commercial, ecological and cultural sustainability of their fisheries. Such tasks require managers to possess high order attributes in leadership, management and conflict management and these are attributes that need to be learnt and developed.

Educational Programmes such as AMC's *MBA Marine Resource Management* focus on providing such development opportunities for up and coming and existing managers.

CANADIAN INTERNATIONAL DEVELOPMENT AGENCY (CIDA)

ASEAN-Canada/ CIDA Fisheries Cooperation*

Our involvement with the fisheries sector in Asia dates back to the Colombo Plan. It is through that programme that I have had the opportunity of meeting many of our Asian partners that today are the sector leaders.

Our fisheries involvement with ASEAN took hold region in 1974, with the regional multi-bilateral, South China Seas Coordinating and Development Programme. The programme was implemented by FAO and focused on exploratory pelagic fisheries development, fisheries institutional building, and socio-economic studies of small scale fishing communities in ASEAN member states.

In 1982, a second phase of the programme was designed to satisfy the general bilateral programming structure of CIDA and to contribute to a more equitable distribution of Canadian fisheries related ODA among ASEAN member states. Activities included, a small-scale rural fisheries project in the Philippines, a small-scale shore infrastructure project in Malaysia, exploratory fishing within the EEZ of Indonesia, and rural fisheries development projects in Thailand.

In 1986 there was a return to regional programming with the approval of two long-term interventions (1) the ASEAN-Canada Fisheries Post-Harvest Technology Programme and (2) the Cooperative Programme on Marine Science. These interventions are scheduled for completion in 2002.

Our continued involvement with fisheries in the ASEAN region, is guided by the following instruments:

1. ASEAN – Canada dialogue;
2. CIDA's ODA policies and priorities
3. CIDA's regional programme framework, and
4. CIDA's Strategy for Ocean Management and Development.

Our Strategy for Ocean Management and Development provides a framework for CIDA's global and regional focus. The document identified the following areas of intervention:

1. Establishing a framework for sustainable ocean development, policy and law;
2. Developing knowledge bases in fisheries and marine sciences;
3. Management of the uses of the ocean and co-ordination and management of coastal zones, shipping and the environment;
4. Fisheries management and development; and
5. Aquaculture/ mariculture development.

Earlier this year our Minister announced the following social development priorities: health and nutrition; basic education; HIV/AIDS; and child protection.

* Lennox Hinds

Specific programme or projects that are linked to areas of intervention, are jointly agreed to by ASEAN and CIDA's Asia regional programme representatives.

Information exchange among ASEAN member states and Canadian institutions has been a key component of all programmes. We have also supported activities that were geared towards harmonizing efforts to develop and promote sustainable fisheries in the ASEAN region. Moreover, we have supported ASEAN's initiative to increase the involvement of universities, private and public sector experts in all elements of the programme cycle (identification, formulation, implementation, monitoring and evaluation).

Networks are important, and according to Tan Sen Min, speaking about the ASEAN – Canada Fisheries Post Harvest Technology network – at a workshop in Newfoundland, Canada 1997, he stated: “The ASEAN network builds in linkages established among regional and national centers.... The network is being fostered through AMAF [ASEAN Ministers for Agriculture and Forestry] which has undertaken to see that it continues to grow, strengthens its structure, and develops appropriate policies to assist it in emerging into an entity which demonstrates technical excellence, as well as a focus on information development and distribution.”

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)

Promoting Regional Cooperation in Fisheries *

The needs for cooperation in promoting sustainable development have been emphasized in many international fora, agreements and arrangements. At the United Nations Conference on Environment and Development held in Rio de Janeiro in June 1992, the Conference adopted Agenda 21 on conservation and management of resources for development as well as means of implementation. For fishery resources and their environments, Chapter 17 of Agenda 21 explicitly outlined the role of international cooperation and coordination on both a bilateral basis and, where applicable, within a subregional, interregional, regional or global framework, in supporting and supplementing national efforts of coastal States to promote sustainable use and conservation of marine living resources, development of coastal areas and marine environmental protection.

The FAO Code of Conduct for Responsible Fisheries (CCRF), adopted in 1995, further stressed that States and, where appropriate, subregional or regional fisheries management organizations and arrangements should foster and promote international cooperation and coordination in all matters related to fisheries, including information gathering and exchange, fisheries research, management and development (Article 7.3.4 of CCRF). Moreover, international cooperation should be encouraged with respect to research programmes for fishing gear selectivity, fishing methods and strategies, dissemination of the results of such research programmes and the transfer of technology which are most relevant to the needs of coastal States in the region.

As regards the high seas fisheries, the Programme Area C of Agenda 21 (Chapter 17) and the UN Fish Stocks Agreement of 1995⁵ stressed the need for States concerned to cooperate in establishing and implementing conservation and management measures for straddling fish stocks and highly migratory fish stocks. In some cases, the obligation to cooperate by flag States and port States is clearly defined. The mechanisms for international cooperation concerning these stocks are identified in Article 8 of the UN Fish Stocks Agreement, i.e., directly or through appropriate subregional and regional fisheries management organizations and arrangements. Where there are no such organizations, relevant coastal States and States fishing on the high seas in the subregion or region will cooperate to establish such an organization or enter into other appropriate arrangements to ensure conservation and management of such stocks.

More recently, regional and international cooperation are required in implementing the International Plans of Action (IPOAs) for reducing incidental catch of seabirds in longline fisheries (IPOA-Seabirds), for the conservation and management of sharks (IPOA-Sharks), for the management of fishing capacity (IPOA-Capacity) and the IPOA to prevent, deter and eliminate illegal, unreported and unregulated fishing (IPOA-IUU). The first three IPOAs were adopted by FAO in 1999 and the fourth was adopted in 2001. Although these IPOAs are voluntary in nature, they represent as an international agreement to manage the concerned

* Veravat Hongskul, FAO Regional Office for Asia and the Pacific

⁵ Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. UN, 1995.

issues in compliance with the Code of Conduct for Responsible Fisheries. States should therefore strive to collaborate through FAO and through international arrangements in research, training and the production of information and educational materials aiming to promote effective implementation of these IPOAs.

Among all international organizations and arrangements, FAO has the most specific mandates and responsibilities in fisheries management and development. Being the largest specialized agency in the UN system, FAO provides technical assistance in fisheries to 180 member countries. A specific priority of the Organization is encouraging sustainable agriculture (including forestry and fisheries) and rural development, a long-term strategy for increasing food production and food security while conserving and managing natural resources. The aim is to meet the needs of both present and future generations by promoting development that does not degrade the environment and is technically appropriate, economically viable and socially acceptable. In doing so, FAO continues to provide technical assistance to developing countries; collects, analyses, interprets and disseminates information; provides independent advice on agricultural policy and planning and on the administrative and legal structures needed for development to member governments; and serves as a neutral forum to discuss and formulate policy on major food and agriculture issues, including international standards/conventions/agreements such as the CCRF and IPOAs mentioned earlier.

In the field of fisheries and aquaculture, FAO implements programmes on fisheries under the Major Programme 2.3 of its biennial Programme of Work and Budget (PWB). This programme aims to facilitate and ensure the long-term sustainable development and utilization of the world's fisheries and aquaculture. This is done with due recognition to the social and economic role of fisheries in meeting global and national sustainable food security goals, providing livelihoods for fishing communities, thus alleviating poverty and slowing the migration from rural areas to the cities. It recognizes that fisheries make significant contribution to national and international trade and to the generation of national income.

For the period 2002-2015, FAO has assessed long-term trends and formulated the Strategic Framework which was endorsed by the FAO Conference in 1999. A number of strategies and priorities was developed which include, *inter alia*,

- ♦ efforts to eradicate food insecurity and rural poverty in coastal areas and main watersheds;
- ♦ policy framework and specific actions required from member countries to secure long-term sustainable development in fisheries and aquaculture;
- ♦ support to coordination and monitoring of the CCRF and the Compliance Agreement⁶, global and regional fishery coordination;
- ♦ support to international and national policy formulation to further promote the safe use and fair trade of fish and fishery products;
- ♦ improved efficiency and adaptability in production, processing and marketing through the adoption of technologies needed for intensified production;
- ♦ management of fisheries in coastal and watershed production systems integrated with the management of land, water and forest resources through the promotion of ecosystem and environmental management and the strengthening of marine resource assessment, contributed to the conservation, rehabilitation and development of environments at risk;

- ♦ promote sustainable aquaculture development at national and regional levels; and

⁶ Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas. FAO, 1995.

- ♦ further efforts to improve the quality, timeliness and access to fishery information, including statistics development at the national level and an integrated policy-oriented information resource base through the development of a Fisheries Global Information System (FIGIS).

Under the Medium-term Plan (MTP) for 2002-2007, the Strategic Framework was translated into a six-year programme under three biennial PWBs. For 2002-03, the main substantive trusts and priorities are given to the management, development, marketing and use of fisheries and aquaculture. The need for more responsible and environment-friendly technology is stressed and the major programme will contribute to: conservation of all exploited ecosystems, with focus on those particularly at risk; rehabilitation of those already damaged; and promotion of environmentally sound sustainable development. Principles and guidance for ecosystem-based fishery management will be further developed and promoted with policy-makers worldwide.

The significant role of fisheries in combating food insecurity is well recognized. The priority work in this area will address sustainable increases in food supply through enhancing the contribution of aquaculture and inland fisheries to food security and supporting the development of small-scale fisheries and fishery-dependent communities.

Monitoring and coordination of the implementation of the CCRF remain important aspects of reinforced policy and regulatory frameworks. FAO will assist Members in building the foundation of good fishery governance through effective legal framework, management planning, institutional capacity and efficient monitoring, control and surveillance (MCS) arrangements. Policy work includes assistance in the coordination and implementation of effective fisheries management and strengthening of regional fisheries bodies. Specific attention is also given to monitoring and analysis of subsidies in fisheries and to management of fishing capacity.

In implementing these programmes, FAO gives high emphasis in global as well as regional cooperation and coordination, especially on marine fisheries management. This issue becomes high priority due to the fact that the majority of all resources are now fully exploited but access to these resources remains open in far too many fisheries around the world. Consequently, as stated by Dr. Jacques Diouf, FAO Director-General, at the Opening Session of the Reykjavik Conference on 1 October 2001, *"Today there are too many vessels chasing few fish.....the task at hand [therefore] is to examine how to manage the fisheries with a view to ensuring sustainable utilization of the food available in the oceans for the benefit of present and future generations without harming the ecosystem's capacity to support human life."*

At the FAO Ministerial Meeting on Fisheries, held in Rome in March 1999, the Ministers expressed concern that many of the world's major marine fishery resources were subject to overfishing, destructive and wasteful fishing practices and excess capacity, resulting in reduced yields and economic returns. The Meeting also noted that only a small number of countries had so far ratified the Compliance Agreement and the UN Fish Stocks Agreement. It welcomed the adoption of the IPOAs and agreed to collaborate with other States as well as relevant intergovernmental and non-governmental organization and financial institutions to promote the effective implementation of the Code of Conduct for Responsible Fisheries. The Declaration on the Implementation of the Code of Conduct, which was adopted unanimously by the Ministerial Meeting on 11 March 1999, provides further guidance for cooperation and coordination among States concerned in managing their fisheries.

In implementing the actions required as outlined in the Code of Conduct, Article 4 of the Code provides that all members and non-members of FAO, fishing entities and relevant sub-regional, regional and global organizations should collaborate in the fulfillment and implementation of the objectives and principles contained in this Code. States and international organization should further promote the understanding of the Code among those involved in fisheries, including the introduction of schemes which would promote voluntary acceptance of the Code and its effective application, where practicable. Specific areas for regional cooperation are given in Article 7 on fisheries management. These include, *inter alia*, cooperation by States concerned in data collection and information exchange, in adopting management measures, in monitoring and controlling fishing activities of their own fishing fleets and in supporting the activities of subregional or regional fisheries management organizations and arrangements.

FAO appreciates the activities being carried out by SEAFDEC in promoting the Code of Conduct in this region and developing relevant regional guidelines such as those on fishing technology and aquaculture. It is important that all member States in Southeast Asia are well aware of the provisions given in the Code. In addition to fisheries management which requires substantial revisions of the current administrative and legal frameworks at national level, the Code also provides approaches towards integrated coastal area management, sustainable aquaculture development, fisheries research, post-harvest practices and trade. FAO has prepared ten technical guidelines to support the implementation of the Code at national, subregional and regional levels.

Regional cooperation and coordination are therefore the key factors in promoting sustainable fisheries and aquaculture in this region. Members of subregional groupings, such as ASEAN and SEAFDEC, can assist other members in strengthening technical capacities based on the existing technical know-how already available in member States. The need for subregional fisheries management organization, however, will become evident soon as many resources exploited in the region are the same stocks. In such case, the relevant coastal States should cooperate to ensure effective conservation and management of these resources. This should be achieved through the establishment of a bilateral, subregional or regional fisheries management organization or arrangement. States and this organization then would agree on the means by which the activities of such organization will be financed, bearing in mind, *inter alia*, the relative benefits derived from the fishery and the differing capacities of countries to provide financial and other contributions (Article 7.7.4 of the Code).

In many cases, however, assistance as required may be beyond the mandate and capability of the said subregional or regional organization, additional support is still needed from other sources including financial institutions and donors. Although FAO is not a donor agency, it provides technical assistance to its Members through the Technical Cooperation Programme (TCP). A large number of such TCP projects have been implemented, as requested by its Members, in the ASEAN region. For example, FAO presently supports the participatory national resources management in the Tonle Sap region of Cambodia, assistance on marine fishery legislation in Indonesia, environmentally sustainable food security and micro-income opportunities in Myanmar, upgrading the safety and quality of fishery products of Myanmar and the Philippines, aquaculture development in northern uplands of Vietnam, and sustainable environmental management of the Bay of Bengal Large Marine Ecosystem (BOBLME).

Under the FAO’s Programme of Work and Budget for 2002-2003, the following programmes, to be implemented by the FAO Fisheries Department, which may be useful for consideration on possible cooperation with Members in ASEAN region are:

- ♦ provision of fisheries information and statistics (231P1);
- ♦ promotion of responsible inland fisheries and aquaculture (232A1);
- ♦ increased contribution of aquaculture and inland fisheries to food security (232A2);
- ♦ marine fisheries resources identification and biodata (232A3);
- ♦ assessment and management of fisheries resources (232A5);
- ♦ reduction of discards and environmental impact from fisheries (233A1);
- ♦ sustainable development of small-scale fisheries (233A2);
- ♦ promotion of coastal fisheries management (234A4);
- ♦ increased production from under-utilized aquatic resources and low-value catches (233A3);
- ♦ economic and social analysis of fishery and aquaculture policy and management (234P3);
- ♦ consumption, safety and quality of fish products (233A4); and
- ♦ promotion of international fish trade (233A5).

At the national level, however, the most urgent issues for cooperation among States in the region should be the collaboration and coordination in assessing the states of fishery resources in both inland and marine areas in order that proper adjustments to the current policies and regulatory frameworks could be made. In doing so, each State needs to strengthen its fishery statistical system to ensure effective assessments and management measures required. In addition, issues relating to monitoring, control and surveillance (MCS) of fishing activities in this region are rapidly emerging. A recent study by FAO indicates that future initiatives to strengthen marine fisheries management in the South and Southeast Asian region might best serve the countries if they encompassed the holistic approach to fisheries management for the countries and promotion of regional cooperation and information sharing among countries concerned. The holistic approach to management would include data collection and analysis, management planning, the MCS legislative instruments and control mechanisms, planning and operations as implementing mechanism for fisheries management plans. In doing so, trainings on fisheries management planning and MCS are needed. For the latter, FAO has organized a regional training in Songkhla, Thailand, in July 2000.

In conclusion, due to the rapid decline in productivity of fishery resources both in inland and marine areas, countries are encouraged to strengthen their policies and legislative frameworks to support national fisheries management planning. Many issues, however, would require cooperation at bilateral, subregional and regional levels to ensure effective implementation of management strategies as adopted. Moreover, such cooperation is no longer voluntary but becomes obligatory under many international agreements/arrangements/initiatives. All States and subregional/regional organizations, therefore, are encouraged to take an active approach towards actions required which include technology transfer, human resource development, institutional arrangement, data and information exchanges and development of management plans for specific shared resources in the subregion/region. In this context, FAO can assist its Member States in developing technical cooperation programmes and field programmes at national and regional levels to ensure sustainable fisheries and aquaculture and thus more “**fish for the people**” which is the central theme of this Conference.

**INTERNATIONAL CENTRE FOR LIVING AQUATIC RESOURCES
MANAGEMENT (ICLARM)**

**ICLARM - The World Fish Center: Policy in the Promotion of Sustainable Fishery
in the ASEAN Region***

Mr Chairman, ladies and gentlemen, I am pleased to be able to have this opportunity to highlight the Center's policy and intentions for addressing, in collaboration with national and international agency partners, some of the key elements required to promote sustainable fisheries in the region. I thank our partners SEAFDEC and all those who have made the conference possible.

The Center sees its role as contributing to poverty eradication, a healthier, better-nourished human family, reduction of the pressure on fragile natural resources and people-centered policies for sustainable development. These commitments resonate well with the "Fish for the People" focus of the current meeting. As an international research organization we seek to address these goals through research, partnership, capacity building and policy support. We promote the sustainable development and use of living aquatic resources based on environmentally sound management.

Fisheries and other sectors: A Consortium approach to research and development of fisheries in the region. The major constraints facing the fisheries of the region have been well stated at this conference, in the conference papers and in the technical sessions. I would like to begin therefore by raising the opportunities that ICLARM's membership of the Consultative Group on International Agricultural Research (or CGIAR) can bring to the region. ICLARM is one of 16 international research centers conducting research predominantly on the challenges to improve the agricultural productivity and environmental sustainability of developing countries around the globe. Our sister institutes have a number of technical capacities that could be applied within research and development consortia to the fisheries issues of the region. The CGIAR system is also moving to a more programmatic rather than institutionally-based approach to major issues which affect developing countries globally and regionally. The formation of research consortia, including appropriate national agencies, UN and regional bodies, and the specific expertise of the international centers could help to address governance of fisheries, their economics and financing, stocking and alternative livelihoods (e.g. through aquaculture), and the effects of agriculture and land-based practices on coasts within the development of overall policy. This is the bigger, multidisciplinary and intersectoral approach that is required, over and above the biological identification of problems, to address the issues of SE Asian fisheries. It also provides the opportunity to link and enhance the capacities of the region to wider international players. We invite your requests and support to capitalize on this opportunity. We hope this meeting and the individual states will be able to convey these messages through the outcomes of these deliberations.

Let me turn now to individual components of the fisheries issues where ICLARM is already playing a role.

A first consideration is overfishing: ICLARM, through its own research and that of its national partners, the initiatives of the FAO, SEAFDEC and others, is keenly aware of the

* Peter Gardiner

crisis affecting the fisheries of the region. In the marine capture sector biomass declines since the time of the second World War means that member states are fishing stocks as much as 80% below their virgin biomass. ICLARM science has drawn attention to the phenomenon of fishing down the food web. Together with the existing overcapacity, these trends lead to concomitant rent dissipation for individual countries running into the hundreds of millions of dollars. The issues of overcapacity have been highlighted but poorly addressed in all sectors. ICLARM's policy in this critical field therefore is to work with regional partners to provide the scientific evidence, and to value the consequences, of current actions and by publicising its concerns to bring the state of affairs to decision makers through fora such as this. An example of our approach has been given by a recently completed eight country-project on a historical evaluation of the state of coastal trawl fisheries in Asia.

For this important study ICLARM developed a data storage and analysis tool and helped the individual country teams work on the assessments of historical trawl data and on ecosystem modeling of key fisheries. ICLARM also provided socioeconomic inputs to help identify the economic consequences of the biomass declines. The project partners encompassed ASEAN member countries as well as other Asian states presented with similar challenges. The work was supported by the Asian Development Bank, by ICLARM and with substantial contributions from the Departments of Fisheries in the participating countries. The outcomes of that study, and the national and regional consultations which examined the results were:

1. Development of the database called "Fisheries Resource Information System and Tools" (FiRST), which contains resource and socioeconomic data for the marine fisheries sector in South and Southeast Asia, and relevant tools for analysis. The FiRST database is now an important regional repository of information for sustainable management of coastal fish stocks in developing Asian countries.
2. Documentation of the decline in coastal fishery resources throughout the region. Alarmingly, stocks are down to 10-30 % of original unfished levels in most countries. Our assessments have also shown that the relative abundance of the more valuable fishes (such as groupers, snappers, sharks and rays) has decreased sharply and that there has been a proportionate increase in smaller, less valuable species (such as cardinal and trigger fishes). These results provide a clear picture of the extent of stock rehabilitation required to restore maximum economic value to the fisheries of the region.
3. Identification of the extent of excess fishing in selected coastal areas. In the case of the Philippines, for example, the level of fishing on the grossly modified stock is 30% higher than it should be, resulting in economic losses (via rent dissipation) of about US\$ 125 million per year.
4. Evaluation of fisheries management in the participating countries, in consultation with key stakeholders, resulting in strategies and action programs that should improve productivity of coastal fish stocks on a sustainable basis. These strategies and action programs at the national level must be augmented by interaction at the regional level also.
5. Improved capabilities in coastal fisheries assessment, planning and management within national institutions. A total of 71 counterpart staff received training in these skills during the project.

ICLARM has been requested to develop a follow on project to (1) assist selected developing Asian countries enhance information, assessments, capabilities and action programs for sustainable use of coastal fishery resources, and (2) strengthen regional collaboration in coastal fisheries assessment and management. Building on the gains and recommendations resulting from Phase I activities, ICLARM has therefore developed a project specifically aimed to:

- ♦ Provide improved assessments (in terms of temporal and geographic coverage) and awareness of the prevailing coastal fisheries situation;
- ♦ Enhance draft national action programs and regional collaborative support activities for sustainable management of coastal fishery resources;
- ♦ Develop an enhanced information system (Fisheries Resources Information System and Tools, or FiRST) for coastal fisheries assessment/management; and,
- ♦ Further strengthen the capabilities of national partner institutions in coastal fisheries research and management.

A major part of the expressed need is to test scientifically some of the management practices that have been proposed for stock replenishment, such as MPAs, or restocking and ICLARM looks forward to conducting such scientific evaluations with key partners so that results and best practice can be shared with other countries of the region.

The implications of the supply and demand in fish and seafood products for developing countries: A second major focus for ICLARM is understanding the context of the supply and demand for fish and seafood products as they affect developing countries of the region. This is so because economic realities affect policy setting, decision-making and the feasibility of taking up and succeeding with technical options identified for the sector. It is worrying to report that whilst biological and gross market statistics on fish are widely known within the sector, fish does not figure currently in some of the major supply and demand models for the world's food projections. ICLARM is working with the FAO and IFPRI (the International Food Policy Research Institute of the CGIAR) to correct this oversight. However, we wish to extend this to understand the dynamics of supply and demand at the regional and national levels. We have thus recently embarked on a nine-country collaborative research project here in Asia

The specific objectives are to:

- ♦ formulate strategies and an action plan for increasing fish production, improving nutrition and income, and protecting fisheries resources so as to benefit poor fish producers and low-income consumers;
- ♦ determine the most viable and sustainable aquaculture and fisheries practices (including prioritization of fish species, farming systems, fishing technologies, and management practice) that are of critical importance to poor fish farmers and fishers as well as low-income consumers;
- ♦ analyze and forecast fish production and consumption by fish species and income groups to evaluate the market potential for alternative fish products of poor farmers and fishers and to identify fisheries management options for increased participation by small-scale fishers; and
- ♦ strengthen the capacity of the DMC participating institutions in fisheries policy research in monitoring the impacts of changes in policy, technologies, and markets on poor households.

Excess capacity: Excess capacity and overfishing plague the southeast Asian seas and resource management and development policies are required to reduce the excess capacity and place the fisheries in the region on the path to recovery and sustainable development. Policies are required to sustainably regulate fishing capacity or to address the ill-structured property rights that give rise to the excess capacity problem. Under the current property rights system each fishing vessel does not possess an exclusive right that is fully specified and transferable, nor are there well-defined groups in a form of regulated common property. Consequently, in many cases, individuals and groups do not have incentives to harvest in a socially efficient manner.

The extent of excess capacity could be an important indicator for fisheries management. Capacity is defined as the maximum yield in a given period of time that can be produced given the capital stock, regulations, current technology and state of the resource. Policy makers are often interested in the number of vessels that can be removed to eliminate excess capacity. Estimates of fleet overcapacity in the region range up to over 200 % for some fisheries. However, excess capacity is not just a mathematical formula – its solution affects people and their livelihoods. ICLARM would be pleased to join with partners in the region to evaluate excess capacity in artisanal systems and to examine alternative livelihood options for those that must be removed from the fishery.

Fisheries indicators: It is now well accepted that the development of indicators for sustainable management of fisheries requires that the indicators be developed with cooperation of the major stakeholders. The defining of relevant sustainability indicators requires a priori that a fisheries policy be established. The policy should recognize that different stakeholders have different interests and that these are accommodated within the policy framework.

The selection of sustainability indicators should be pragmatic, i.e. taking into account what information is available. Effort should be devoted to making information collected from the various parts of the fishery system readily available

Indicators should be as simple as possible which means starting up by selecting single species (key indicator species or functional species groups which are easier to measure than populations), or single fleet indicators prior to more complex indicators (community or ecosystem measures, total industry measures). The aim should be at describing direct effects (e.g. stock depletion, habitat degradation) before describing second order interactions. The indicators have to be used by local level fishers and fisher groups and their acceptance is important to be effective for management. Much of the information may exist locally or can be derived from local communities or may be available in databases such as ICLARM's Fishbase or the partners' trawl fishery database, FIRST, referred to above. Indicators describing states are easier to derive than indicators describing rates of change. State variables are often directly observable whereas rates usually require modeling approaches. Socioeconomic variables are also more difficult to monitor and different scientific techniques must be used to chart changes in these parameters. There is an opportunity here for international partners to backstop national efforts in evaluating fisheries management. Indeed, a major part of ICLARM's modus operandi is the provision of *scientific advice to the work of others*. We have provided inputs to SEAFDEC and the FAO working in selected SE Asian countries on the development of fisheries indicators.

Governance: Co-management arrangements, by which we mean the joint management of fisheries by government and local communities of stakeholders, have been evaluated by ICLARM in a global project. There are many encouraging examples of co-management arrangements working harmoniously on the production imperative. It is yet to be more widely determined if communities of users will respect the biodiversity and long term sustainability issue. It is clear that co-management does not just happen but must be introduced, nurtured and lent long term strength by national and local policies for devolved governance and fisheries in the countries of the region. ICLARM continues to evaluate the strengths and weaknesses of these important advances in locally shared governance of fisheries. We recognize, however, that flexible variations on the general theme, and often site-specific arrangements, will have to be adopted pragmatically. Nevertheless our experience suggests that common to all community arrangements are the social issues which determine the legitimacy and conflict resolution in community-based governance, and this is the thrust of our current work.

Coral reef fisheries: ICLARM has a particular focus on the evaluation of coral reef fisheries and the provision of alternative livelihoods through coastal aquaculture. The Center is sharing its experiences from the Pacific (and to a lesser extent from the Caribbean) with states in the ASEAN region. We believe this is an important ingredient in the overall consideration of excess capacity in artisanal fisheries in tropical latitudes, as well as the promotion of sustainable and reduced-risk aquaculture. ICLARM also is developing ReefBase as a database on the issues affecting the management of coral reefs globally.

Inland water fisheries: In inland water systems, challenges to fishery production from habitat degradation, the competitive use of water from agricultural and other sectors, as well as tenurial issues and overfishing threaten the continued expectation that fish from common property resources will remain as an important component of food security for the poor of the region. Some inland floodplain systems show signs of having been shifted to harvests of low value, small fish having short generation times. ICLARM believes that the only way to address the issues of inland water fisheries is to consider the fisheries as a user of water amongst others; to appropriately value the fish and living aquatic resources as components of food security, livelihood and local and international trade; and to promote fisheries and wetland planning and governance as a component of comprehensive approaches to water-basin development. ICLARM continues to work with national partners in the region in the proper estimation of catches and household use, on community-based methods for the exploitation of permanent and temporary water bodies, on the provision of decision support systems for management choices and in legal and institutional governance of the wetlands. We look forward to working jointly with the states of the region to utilise the results and to extend the successful practices for the appropriate exploitation of the fisheries and other aquatic resources of the region.

INFOFISH

INFOFISH Policy Statement on Fishery Cooperation with ASEAN Member Countries*

Introduction

INFOFISH is an intergovernmental organisation providing technical and marketing support to the fisheries industry in the Asia-Pacific region and beyond, based in Kuala Lumpur, Malaysia. Currently there are ten member countries of INFOFISH - Bangladesh, India, Indonesia, Korea DPR, Malaysia, Papua New Guinea, Solomon Islands, Sri Lanka and Thailand. Another South Asian country, Pakistan, is in the process of joining the organisation. INFOFISH was originally established in 1981 as a regional project of the Food and Agriculture Organization (FAO) of the United Nations. It became an intergovernmental organisation in 1987.

INFOFISH is also the Asia-Pacific arm of the FAO-GLOBEFISH fisheries info-network. The other offices of this global fisheries information network are INFOPECA (based in Montevideo, Uruguay) covering the Latin American and Caribbean region, INFOPECHE (based in Abidjan, Cote d'Ivoire) covering the African region, INFOSAMAK (Casablanca, Morocco) covering the Arab countries, EASTFISH (Copenhagen, Denmark) covering Eastern Europe, and INFOYU covering PR China from its base in Beijing. INFOFISH maintains a close working relationship with the Food and Agriculture Organization of the United Nations (FAO) and the FAO is a partner in many of its projects and programmes.

The services of INFOFISH include trade promotion, provision of marketing information, technical advice on processing, handling, fishing and aquaculture, consultancy and the organisation of regular conferences, exhibitions, workshops and seminars on various aspects of the fisheries industry.

Trade Promotion

In the area of trade promotion, INFOFISH compiles and disseminates information on fishery trade. The information is on product and market diversification, prices and markets, landings, supplies, exports, imports, current news, short term trends, cold storage holdings, and related information. This information is disseminated via regular publications such as the fortnightly INFOFISH Trade News, INFOFISH Fact Sheets, European Fish Price Report, GLOBEFISH Highlights, and GLOBEFISH Commodity Update as well as electronically. Other services related to trade promotion include news on trade opportunities, buyer-seller matching, a statistical database, importer-exporter database and promotions at trade shows. Market information is obtained via a network of market news correspondents (MNCs) based in various parts of the world, including major markets.

Marketing Information

INFOFISH also provides comprehensive information on markets and marketing, handling, processing, quality control, technology, harvesting, aquaculture, new products, equipment manufacturers and suppliers, opportunities, etc. Much of this information is provided through

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the vehicle of the INFOFISH *International*, the well known bimonthly all-in-one fisheries and seafood magazine. Over 7,500 copies of each issue of the magazine are distributed and the estimated global readership is around 25,000. The geographical breakdown of its circulation is as follows: Asia-Pacific (42%), Europe (16%), North America (12%), Latin America (11%), Arab countries (7%), P. R. China (7%) and Africa (5%).

Technical Advice

The Technical Advisory Service of INFOFISH provides technical information on aquaculture, handling, storage and transport of fishery products, fishing gears and methods, equipment, technology and supplies, environmental issues, sustainable development and management of fisheries, and new products. INFOFISH has over the years built up a number of key resources to aid in this. They are: an up-to-date Technical Information Centre, which is a highly specialised technical library; a register of Equipment and Supplies and Clearing House on Fishing Technology, representing a database of manufacturers and suppliers of equipment, products and supplies for the fisheries industry; a Consultants' Register; Bibliographic Listings; and a Photo and Video Library. INFOFISH also organises courses, workshops and study visits to promote technological transfer. Two quarterly publications which aid in this technology transfer are *The Fish Inspector*, a bulletin on seafood safety, sanitation, and epidemiology, and *The Fishing Technology Digest*, covering fishing technology, fishing gear and methods, vessels, etc.

Consultancy

This is a key area of focus. Consultancies can be of short or long duration and cover all aspects of fisheries, including culture, capture, processing, marketing, etc. Expertise for these consultancies is drawn both from in-house professionals and from qualified international experts, consultants and market correspondents.

Conferences and Exhibitions

INFOFISH also organises regular international conferences on topics related to fisheries and occasional training workshops. The speakers featured in these conferences are persons of international repute who are experts in their respective areas of expertise. The subjects discussed at these conferences are topical issues, the current scenario on fisheries, future prospects, new products and so on. The conferences also provide a valuable opportunity for key industry players to interact and conduct business. In 2001, INFOFISH organised the TILAPIA 2001 and SHRIMP 2001 conferences, which together drew over 500 participants from some 50 countries. INFOFISH will be holding the regular TUNA conference in May next year in Kuala Lumpur.

Associate Membership

While direct membership of INFOFISH is reserved for countries in the Asia-Pacific region, Associate Membership is open to individuals, institutions and organisations from all over the world. Benefits of Associate membership include free subscription to the INFOFISH Trade News and INFOFISH *International*, free e-mail access to the INFOFISH Trade News, discount on INFOFISH publications, advertisements and conferences, access to the FAO-GLOBEFISH databank, an opportunity to express views on INFOFISH programmes and policies, and networking opportunities.

Policy on Promotion of Sustainable Fisheries

INFOFISH is committed to the sustainable development and management of fisheries, aquaculture, processing and trade in the area of its coverage and beyond, including the ASEAN countries. It actively promotes sustainable fisheries, aquaculture and trade through its publications, information dissemination activities, conferences, etc. It is prepared to cooperate with other organisations and various countries to further the cause of sustainable fisheries, aquaculture and trade, especially in the Asia-Pacific region and including ASEAN.

Past and Current Programmes and Projects

Among the activities of INFOFISH related to the promotion of sustainable fisheries, aquaculture and trade are the following:

- ♦ Regular conferences on trade and production (culture, harvesting and processing) to promote sustainable production methods.
- ♦ Dissemination of information on sustainable farming, processing and trade through INFOFISH publications (e.g. INFOFISH *International*) and various articles and papers.
- ♦ Monitoring of developments in world trade of fish and fishery products and technological developments in the various technical areas related to fisheries, such as aquaculture, fishing, handling, processing, quality control, etc.
- ♦ Training programmes in HACCP verification and audit
- ♦ Workshops on production and processing of value added seafood products.
- ♦ Market information on fish and fishery products.
- ♦ Seminars to promote sustainable farming techniques (eg for shrimp, crabs, tilapia, etc)
- ♦ Identification and promotion of environmentally friendly sustainable aquaculture practices.
- ♦ Organisation of study visits and related programmes to promote technology transfer of sustainable farming and fishing techniques.
- ♦ Participation in regional meetings on cleaner fish harbours.
- ♦ Studies on improved utilisation and marketing of marine resources.
- ♦ Strengthening fisheries conservation and management.

ASEAN and INFOFISH

Most of the foregoing INFOFISH projects and programmes have involved ASEAN member countries. Among these are Malaysia, Thailand, and Indonesia (which are also members of INFOFISH) and Vietnam, Cambodia, the Philippines and Myanmar (which are not yet members). The programmes provide an opportunity for the industry and regulatory authorities in the ASEAN countries to interact and network with the global industry. Over 80% of INFOFISH industry events have been held in ASEAN member countries. In addition, more than 50% of all technical and trade inquiries handled by INFOFISH are from the ASEAN region. This shows that INFOFISH is very much involved with ASEAN countries through its programmes and services.

Potential Areas for Collaboration with ASEAN

There are several areas where INFOFISH can collaborate with ASEAN member countries with regard to sustainable fisheries and aquaculture. Some of these are:

- ♦ Compilation and updating of fishery industry profiles of the member countries of ASEAN to promote investment in sustainable fisheries, aquaculture, processing and trade activities in these countries.
- ♦ Organisation of training programmes in HACCP verification and audit and awareness programmes in risk assessment and eco-labelling.
- ♦ Workshops on value addition, product development and seafood presentation.
- ♦ Improvement of post-harvest handling and processing of fishery products.
- ♦ Market studies and fisheries trade promotion.
- ♦ Promotion of sustainable aquaculture
- ♦ Introduction to the concepts of organic farming and eco-labelling to the ASEAN industry
- ♦ Facilitate the ASEAN industry to benefit from World Trade Organisation (WTO) provisions through awareness building in FAO-assisted workshops and training programmes.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

JICA 2001- Delivery of aid to the fisheries sector in the ASEAN region *

Introduction

JICA is responsible for the technical cooperation aspect and implementation of Japan's ODA programs. Technical cooperation is aimed at the transfer of technology and knowledge that can serve the socioeconomic development of the recipient countries. JICA has about 1,200 staff members working both in Japan and at its more than fifty overseas offices. Technical Cooperation programs (See Table 1 for details) include;

1. Technical Training Program
2. Dispatch of Experts
3. Provision of Equipment
4. Project-Type Technical Cooperation
5. Dispatch of JOCV's
6. Development Studies

Of the six programs mentioned above, project type technical cooperation is a comprehensive approach to promote technology transfer. This program provides integrated assistance, from planning and implementation to evaluation, by combining three types of cooperation: 1) training programs in Japan, 2) dispatch of experts, and 3) provision of equipment. Training in JICA is divided into group and individual programmes carried out in Japan or developing countries. Group training involves around ten persons in a set curriculum and includes multinational and country/region-specific courses. Individual training is for counterparts to JICA experts. Group Training implemented outside Japan is called "Third County Training Programme" or TCTP and has advantages in that the trainees share similar linguistic and cultural backgrounds and come from similar environments. Japan based training is utilized for training in which Japan is renowned for its capability such as the fisheries and marine environment sectors.

Project type technical cooperation is largely implemented in four sectors: social development; public health and population/family planning; agriculture, forestry, and fisheries; and industrial development.

In this paper, we describe the various programs that JICA has in the fisheries sector, focusing on the activities carried out in the ASEAN region and describe the current JICA aid delivery system and how it can be strengthened to improve the sharing of project outputs within the broader regional community. Clearly, to achieve this requires an effective regional coordination mechanism.

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Table I. Summary of JICA ODA activities all sectors

	FY1999	FY1998
Japan's total ODA (calendar year, including aid for Eastern Europe and graduate nations)	US\$15.385 billion	US\$10.732 billion
JICA's technical cooperation costs (excluding administrative costs)	149.5 billion yen	155.8 billion yen
Recipient countries	151 countries	153 countries
Technical training participants (new)	17,903	19,718
Experts dispatched (new), including:		
Individual experts	4,003	3,423
Project-type technical cooperation experts	1,745	1,363
	1,922	1,636
Members of study teams dispatched (new)	8,818	8,482
JOCV's dispatched (new)	1,290	1,170
Project-type technical cooperation projects	232 (58 countries)	229 (55 countries)
Development studies	251 (81 countries)	269 (83 countries)
Grant aid projects (expedited by JICA)	241 (79 countries)	232 (81 countries)
Dispatch of JDR teams, Emergency aid	33 (18 countries)	30 (25 countries)

Notes:

Figures for technical training participants include local training participants (in-country training participants), third-country training participants, Youth Invitation Program trainees, and overseas Japanese trainees.

Figures for JOCV's in 1998 include overseas Japanese youth volunteers and UN volunteers. They are not included in the figures for 1999.

Figures for project-type technical cooperation are indicated on an R/D base.

Figures for development studies are for projects involving preliminary studies, main studies, report explanations, etc. (i.e. excluding projects at the preliminary study stage and studies completed the previous year or earlier).

Figures for grant aid are for projects (expedited by JICA) ratified by the Cabinet in fiscal 1999 and signed (E/N) by the end of May 2000.

Themes of project type technical cooperation in the fishery sector

The first Project type technical cooperation carried out in the fisheries sector started in Thailand in 1973 and originated from the "Shrimp Aquaculture Development Plan prepared for the country. Since then, JICA has carried out forty-one project type technical cooperation's, the latest of which is now in the planning stage in Costa-Rica in the field of resource management.

Of the 40 project type cooperation's carried out in the fisheries sector over the last thirty years, nineteen were in aquaculture, seventeen in fisheries training and resource management, three in processing and quality assurance of fisheries products, and one in development of fisheries education. The sub sector strategies are described below in more detail

Aquaculture

Aquaculture Projects are divided into 3 groups (marine, brackish, and freshwater). Originally, the objective of aquaculture project was to earn foreign currency by culturing marine high value species such as shrimp and grouper and to increase fisherman's income. However,

recently, the needs for Food Security (World Food Summit in 1996) and Poverty Reduction (DAC Meeting "New Development Strategy for the 21st Century"), has shifted emphasis to the needs for fresh water aquaculture development such as carp and tilapia Culture. Examples of JICA aquaculture support strategy include;

- ♦ Empowerment of women
- ♦ Institutional building
- ♦ Environmentally friendly aquaculture
- ♦ Seed production and rearing techniques
- ♦ Training of extension workers
- ♦ Polyculture techniques

Fisheries Training and Resource Management

In accordance with world consensus on resource management, such as EEZ, UNCLOS, FAO Code of Conduct and the DAC "New Development Strategy for the 21st Century", Fisheries training shifted from developing techniques to catch fish more effectively to environmental friendly and sustainable fisheries where biological waste is minimized. One of the project type cooperation of fisheries sector, "Establishment of Extension System for Artisan Fisheries in Morocco", started from 2001, aims to establish effective system for develop artisanal fisherman's living standard and coastal resource conservation. Other examples of JICA fisheries resource management support strategy include;

- ♦ Fishing effort control
- ♦ Fishing rights and co-management
- ♦ Fishing ground improvement
- ♦ Habitat protection
- ♦ Strengthening of fishers associations and cooperatives

Processing and quality Assurance of fisheries Products

In this sector, our initial objectives were diversification of seafood products and efficient distribution systems and cold chains. However, after the FAO/ WHO CODEX in 1993, our objective shifted from specific processing technologies to quality management systems. Examples of JICA support strategy include;

- ♦ Cold chain improvement
- ♦ HACCP and other food safety systems
- ♦ Product preservation technologies
- ♦ Product diversification
- ♦ Primary processing and care of the catch
- ♦ Secondary processing and value adding technologies
- ♦ Marketing and distribution networks

Fisheries Sector cooperation in ASEAN region

As of November 1, 2001, JICA has three ongoing project type technical cooperation's in the ASEAN region (Malaysia, Indonesia and Laos and one development study project in Indonesia (Table II). The JICA sector approach for the ASEAN region is shown in Table III. In fiscal year 2000, thirty-five experts, three senior volunteers, twelve JOCV's and thirty-three recipient country persons participated in fishery sector programs (Table IV).

Table II Projects underway and allocations of human resources in the fishery sector in ASEAN countries as of Nov. 1 2001

Country	Subject	Technical Cooperation schemes						
		Fisheries training	Dispatch of Experts	Project-Type Technical Cooperation	Development Studies	Dispatch of Senior Volunteers	Dispatch of JOCV's	
Thailand	Trainees	10						
	Marine Engineering		1					
	Socio-economist		1					
	Aquaculture					1		
Philippines	Trainees	4						
	Aquaculture						8	
Malaysia	Trainees	3						
	Resource management		3					
	Marine Science		1					
	Aquaculture					2	2	
	Aquatic resources in Malacca straits		3	X				
Indonesia	Trainees	2						
	Aquaculture		2				4	
	Socio economics		1					
	Aquaculture Development Project		5	X				
	Grant aid program – HRD for fisheries resource management Semarang							
	Development study team-fisheries infrastructure support and coastal communities development plan E. Indonesia				X			
Vietnam	Trainees	1						
Myanmar	Trainees	1						
Cambodia								
Laos	Trainees	1						
	Aquaculture improvement & extension		4	X				
Singapore	Pesticide residues		1					
Brunei								

Table III. Sector approach in the ASEAN Region

Country	Theme	Issues	Objectives
Thailand	Environmental conservation	Decline of fishery resources Degradation of coastal environments	Appropriate coastal resource management Sustainable aquaculture development and extension
Philippines	Food security	Low income and catch landings	Upgrading of fishers income Fisheries technological development and extension services Economic Infrastructure development of fishing villages
	Sustainable development and environmental management	Degradation of Environment	Sustainable development and environmental management Monitoring of red tides Environment friendly aquaculture
Malaysia	Conservation and sustainable development	Decline of natural resources Degradation of marine and freshwater environments, lack of capacity building	Environmental conservation Sustainable development and environmental management
Indonesia	Food security	Lack of capacity to plan and manage Limited education and training services	Comprehensive policy and planning of food marketing Strengthening in policy and planning Aquaculture development Education and training of small scale fishers
	Environmental conservation	Habitat and coral reef destruction	Monitoring of coral reef destruction Developing countermeasures against reef and habitat destruction Marine ecology research
Vietnam	Disparity between urban and rural areas	Lack of Infrastructure Lack of capacity to plan and manage	Policy and planning strengthening Management of fishing villages Promotion of fisheries associations or cooperatives
Myanmar	Depletion of natural resources	Over exploited resources Destruction of marine ecosystems	Stock assessment of marine resources in Andaman Sea
Cambodia	Agriculture improvement	Low income	Improved income generation Fisheries promotion Fisheries resource management Aquaculture development
Laos	Food Security	Livelihood of agricultural farmers Lack of diversification of food crops	Livelihood improvement Freshwater aquaculture development
Singapore and Brunei		Countries expected to play a role as regional donors	

Table IV. Number of persons dispatched to ASEAN region or participated in training FY2000

Country	Experts	JOCV	Senior Volunteers	Participants in training
Thailand	3	0	1	9
Philippines	5	7	0	7
Malaysia	6	3	0	7
Indonesia	14	1	2	5
Vietnam	0	0	0	0
Myanmar	0	0	0	0
Cambodia	1	0	0	1
Laos	4	1	0	4
Singapore	2	0	0	0
Brunei	0	0	0	0
Total	35	12	3	33

Aid delivery strategy

The rationale for bilateral approach to development

Sector based planning approach is attracting much attention now, especially in the fields where many donors are active, such as health care and basic education. The merits of such an approach are based on the pre-condition that there is consensus among recipient country governments and all donors regarding priorities for aid delivery based on long term sector wide objectives. In this framework, bilateral aid resources are expected to put into a common basket, and disbursed within a sector plan and not based on the interests of the bilateral donor. Theoretically, the common basket approach has the opportunity to decrease waste of financial resources and reduce duplication. However, country specific needs and sector priorities, disbursements based on performance, degree of consensus and lack of capacity within countries and regional organizations to manage and administer, make regional administration complicated to manage and apply.

On the other hand, aid delivered on a bilateral basis may have some comparative advantage based on existing human networks, historical relationship with each recipient country and specialization in a particular type of aid provision. For example, Japan's comparative advantages are multi species/multi fishing methods, co-management system, sashimi grade quality control, fish processing technologies and a 70kg per capita annual consumption of fish. The high consumption patterns of fish and reliance of fish as a source of food and income within most ASEAN countries make the region extremely important for Japan's ODA. The importance of fish to Japan and specific countries in the region are factors that may create more active and positive energy in the field of cooperation. After all, technical cooperation is a human activity and incentive and motivation of the people involved are key aspect. Bilateral cooperation can fully enjoy the following advantages.

- ♦ Significant experience with delivery mechanism and administrative procedures between donor and recipient country
- ♦ A focus on the specific needs and priorities of the country requesting aid
- ♦ Greater opportunity to respond to the socio-economic and cultural aspects of individual countries
- ♦ The ability to match, adapt and design a specific mechanism of transfer of ownership of technology
- ♦ ODA is a useful tool for diplomacy and Japan is a trading nation with mutual interests in developing certain sectors of different countries economies.

However, under bilateral cooperation schemes, the area of activities is restricted to the recipient country's borders resulting in a low utilization of facilities and limited opportunity for human resources trained in the projects to participate in development in neighboring countries. This is of particular concern now, due to the decline of most donors aid budget and a resulting decrease in the number of projects delivered. Clearly sharing both facilities and human resources generated through delivery of aid within the region would be a welcome improvement. JICA is making efforts to employ a regional approach, regional projects, regional experts and third country training. However, it is not easy to collect the necessary information on the policy and actions of each ASEAN country and donors. Moreover, it is extremely difficult to achieve frequent exchange of views, achieve consensus for better cooperation and to improve the effectiveness of projects.

Future considerations for effectiveness of aid delivery

The JICA objectives for technical cooperation in the fisheries and marine environment sectors are that it be driven at the recipient country level to achieve practical, realistic and achievable approaches to develop countermeasure solutions that lead to sustainable utilization of natural resources. This process should be transparent, flexible and embrace a participatory approach to ensure all stakeholders are represented.

In the past JICA fisheries aid projects have focused mainly on provision of "technical" components with not enough emphasis paid to human resource development and the social, economic and cultural contexts where the project is carried out. To ensure that the project life extends well beyond the initial seed funding provided by the donors, there is a need to place a greater emphasis on "human centered development". This shift in emphasis can assist in strengthening local leadership, ownership of ideas, self-reliance and gender parity into development and contribute to self-sufficiency of the recipient country. Therefore, it is

important to ensure adequate attention is paid to human resource development and to integrate training with the broader technical cooperation objectives.

In this context, the formulation of future projects in the region should consider the following issues

1. Importance of Base Line Survey: To understand the fishing village, it is not enough to conduct fisheries survey only. There is a critical need to conduct social surveys to understand whole situation of target group (fisherman / fishing village).
2. Difference in the needs and characteristics of the community: There are various types of human resources within fishing communities. For example, some of their residents are not only fisherman but another, some of their needs are different by gender and age, some of them are migrant fishers or fishers living on boats. Greater care should be given to analyzing the needs and characteristics of the whole community. The analysis should consider the total needs of the fisheries community or fishing village.
3. Integrated approach to development: The objectives of the fishing village improvement are to enhance living standards and welfare of the community. Fisheries development is only the one method to achieve this objective. Therefore it is necessary to consider not only within the fisheries sector but also other sectors utilizing marine and freshwater resources such as agriculture, forestry, and tourism etc. However, integration must be considered within and across sectors. For example, fishery management, environment conservation, fishing, aquaculture, processing, marketing and boat maintenance should be integrated each other. Infrastructure, water, health, education, welfare, credit, cottage industry, agriculture, livestock are sectors that are expected to integrate with fisheries. This cross-sectoral approach is very new to JICA and needs collaboration with JICA other cooperation schemes, NGOs, and other donors.
4. Participatory Development Approach: Social structure of fishing village is complicated with various vertical and horizontal hierarchies. To understand the problems of the whole fishing community requires the application of a wide variety of social science tools such as PCM, PRA, RRA.
5. Equity in site selection: There are a lot of fishing villages and fisherman that need development assistance, but the actual number receiving assistance is limited. Selection of the target group or fishing village should be based on not only economic impact and ease of project implementation but also on fairness and ability to use the site as a “model”

where other communities can observe and learn from activities. Therefore, site selection should be based on a set of objective criteria and transparency.

6. **Appropriate Scale of the Assistance:** It is important to ensure that delivery of aid creates opportunity for the recipient country to fully participate and eventually to take ownership of the project and to continue its operation after the seed funding phase has been completed. Therefore, to achieve this objective, project type technical cooperation should be more flexible to ensure the matching of hard and soft technical assistance to the recipient country capacity.
7. **Model site approach:** To achieve JICA overall goal, the project site is expected to be model for the region or country. The conditions for getting success are leadership, enough fishery resources, competitive technical and administrative staff, infrastructure (road, water, electricity, fishing port), and market. Objective criteria need to be developed for site selection.
8. **Institutional building approach:** Fishers, processors, community or related peoples organization are the basis of many projects. How to build up a strong human network is important to the success of many projects. Meeting place, Ice making machine, landing place, processing site, payao, joint purchases/selling and exclusive fishing rights are examples of powerful tools for community solidarity.
9. **Improved integration of elements of JICA technical cooperation:** Partnering and team building are essential mechanisms to deliver successful technical cooperation projects. The seeds for cooperation can begin through JICA training programs many of which are now focused on project formulation and planning. Building opportunities for participants of JICA training, consultants, lecturers, Japanese overseas cooperation volunteers, experts to interact together is a valuable step in awareness building of critical issues and for having common objectives.
10. **Sustainable projects through self reliance:** The overall goal of JICA fisheries cooperation is that fishing communities find and build the way of development on their own. Raising awareness, self-reliance and recipient country leadership are the key step to achieve this objective. This requires much greater emphasis on human centred development.
11. **Achieving project targets by measuring outputs:** Technical cooperation projects need to have a set of clearly defined objectives and a mechanism for quantifying the extent to which they have been achieved as the project proceeds through to completion. For this

purpose, there is a need for each project to be based on a logical framework plan with objectively verifiable indicators and means of verification.

Recognizing the need to improve information sharing in the region and to maximize the utilization of facilities and human resources generated through projects, there is a need to establish a regional coordination and cooperation mechanism. This would include developing an information system on each country's development needs, priority, financial and human resources available, present and pipeline projects. A regional program to disseminate outputs of bilateral projects might also prove to enhance the cost benefits of bilateral project. A regional inter governmental organization could greatly assist in coordinating all players and enhance collaboration within the context of existing proven aid delivery mechanisms.

**JAPAN INTERNATIONAL RESEARCH CENTER FOR
AGRICULTURAL SCIENCES (JIRCAS)**

**Current and future programs of Japan International Research Center
for Agricultural Sciences***

Japan International Research Center for Agricultural Sciences (JIRCAS) has current staff 161, including research scientists and administrators. Thirty-eight of these staff members are located at the Okinawa Branch on Ishigaki Island. The main office has nine research divisions of Research Information, Biological Resources, Environmental Resources, Crop Production and Post Harvest Technology, Animal Production and Grassland, Forestry and Fisheries. Objectives and main activities of JIRCAS are as follows.

Objectives

1. Develop techniques for promoting sustainable production of agriculture, forestry and fisheries compatible with the preservation of the environment.
2. Conduct studies to address problems of food supply and environmental degradation worldwide.
3. Coordinate international cooperative research programs in agricultural, forestry, fisheries and socio-economic sciences in a large number of countries worldwide.
4. Develop advanced technologies at JIRCAS laboratories in Tsukuba and Okinawa to promote further research outside Japan.

Main activities

1. Organize cooperative activities between JIRCAS researchers and counterparts in various countries.
2. Promote basic research at JIRCAS to support cooperative studies among foreign countries.
3. Invite and accommodate scientists from foreign countries.
4. Analyze research information for supporting the international cooperative work.
5. Organize international symposia, workshops, and seminars.
6. Act in and advisory capacity for food and environmental issues worldwide.
7. Advise organizations involved in overseas development assistance.

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The main comprehensive projects are:

1. Development of new technologies and practices for sustainable farming systems in the Mekong Delta.
2. Comprehensive studies on sustainable agricultural systems in North Thailand.
3. Comprehensive studies on the development of sustainable agro-pastoral systems in the subtropical zone of Brazil.
4. Development of sustainable production and utilization of major food resources in China.
5. Comprehensive studies on soybean improvement, production and utilization in south America.
6. Evaluation and improvement of regional farming systems in Indonesia.
7. Improvement of food security in West Africa through the increase of productivity of rainfed rice systems.
8. Development of agroforestry technologies for the rehabilitation of tropical forests.
9. Development of low-impact technology for reducing postharvest losses of staples in Southeast Asia.
10. Sustainable production systems of aquatic animals in the mangrove brackish water in Philippines, Malaysia and Thailand.

Activities in fisheries research area

The Fisheries Division of JIRCAS conducts research concerning several characteristic aspects of fish inhabiting sea and freshwater. As an international collaborative activity in the field of fisheries, the Fisheries Division has five major research projects in Asian countries, including efforts to improve the management of fisheries resources and the coastal environment in Malaysia, aquaculture in Thailand, Vietnam, Indonesia and The Philippines, and fisheries product processing in China. In addition to these studies, the Division also endeavors to take part in a research project targeting fish viral diseases in Southeast Asian countries including The Philippines and Malaysia.

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uring FY2000 - 2001, the Division carried out research on fisheries resource management in Malaysia with the Fisheries Research Institute (FRI). This project involves the integration of studies in fisheries and forestry. JIRCAS has successively dispatched a senior researcher to Penang, Malaysia, to provide long-term oversight for the research, and several short-term scientists specializing in fish larval ecology. In March 2001, to extend this research to the international multidisciplinary project, a project meeting was held with the participation of colleagues from The Philippines, Malaysia and Thailand. In this meeting it was agreed to proceed with studies to establish a method of encouraging low-input synthetic food and drug in aquaculture procedures that takes advantage of the naturally-occurring circulation system

which occurs in mangrove forests, combined with the development of more profitable aquaculture procedures based on the rearing of new indigenous aquatic species of a high commercial value. In addition, after these sustainable production systems in brackish mangrove areas are put into practices, studies will be needed to analyze and publicize their economic and environmental advantages to promote and encourage their wider use.

At the same time, the Division remains involved in several other ongoing projects. These include collaborative studies on the environmental management of the coastal waters of Indonesia based on the ecological and chemical analyses being conducted in Maros, South Sulawesi, Indonesia, in conjunction with the Research Institute for Coastal Fisheries (RICF) under the jurisdiction of the Central Research Institute for Fisheries (CRIFI). The project aims to deepen understanding of plankton ecology and its environmental factors to improve marine resource management methods. One researcher was dispatched to Maros as a long-term resident scientist.

The Division's collaborative work on the development of sustainable aquaculture technology in Southeast Asia also continued at SEAFDEC and Kasetsart University in The Philippines and Thailand, respectively. In addition, the Division has been participating in a comprehensive project entitled "Evaluation and improvement of farming systems combining agriculture, animal husbandry, and fisheries in the Mekong Delta" with the college of Agriculture at Cantho University in Vietnam. This project involves multidisciplinary studies of integrated farming systems to address problems in rice production, animal husbandry, freshwater aquaculture, and socio-economics.

Subjects being solved

The significant increases in food production which have been realized in the past quarter century are due in part to advances in technology that allow for increased yield per unit of cultivated and fisheries areas. Despite many successes, however, numerous new problems have appeared in recent years. For example, global grain yield and fisheries catch have tended to stagnate and the yearly rate of their production have dropped significantly worldwide. Depression of land cultivation due to urbanization, soil loss and water shortages have demonstrated the fragile foundation on which our food production is based. What is more, serious degradation of the global environment has become increasingly apparent. From now on land and water resources should be conserved and we should decrease our dependency on chemicals. At the same time promotion of the development of sustainable agriculture, forestry and fisheries activities shall be searched, that will support mankind's continued existence. As the new millennium dawns, these are the critical issues and challenges we must face. And these problems, the unstable supply of food, the earth's environmental problems and

widespread poverty, are especially serious in the developing regions of our planet. The answer to these issues lies in global cooperation of the scientists in the fields of agriculture, forestry and fisheries worldwide.

MARINE INSTITUTE OF MEMORIAL UNIVERSITY OF NEWFOUNDLAND (MI)

Sustainable Fisheries Development: The Marine Institute's Vision. " Survive and Thrive through strategic partnerships."*

Introduction to the Fisheries and Marine Institute of Memorial University

The Fisheries and Marine Institute of Memorial University, or the Marine Institute (MI) as it is commonly known, is North America's most comprehensive institute dedicated to education, training, and industrial support in oceans industries. The three campuses and its complex of world-class facilities provide the setting for excellence in education, training and research. MI is a unique entity in the Canadian post-secondary system and offers education and training programmes at the vocational, technical, technology, undergraduate and post graduate levels. It is also active in technical assistance and applied research in a variety of marine and aquatic related fields through its specialized units and industrial assistance office. Developing, applying, and transforming new technology initiatives to support the fishery and other marine industries is a key aspect of MI's mandate. Use of advanced multimedia and distributive learning technologies are integral aspects of national and international program delivery.

A Brief History: Responding to the Crisis

The history of the Atlantic coast of Canada is tied directly to harvesting of groundfish species. During the early 1990s this ended with a collapse of groundfish stocks and enormous social and economic impacts upon the region. On July 2, 1992, the Government of Canada announced the closure of the Northern Cod fishery due to seriously low stock levels. More than 30,000 jobs were lost overnight making it the largest single loss of employment in Canadian history. The job losses, which represented more than ten per cent of the provincial workforce, left the industry and the coastal communities devastated.

A decade later, however, the industry has adapted to the crisis, shifted to new species and markets, and now has the highest value in its history. The Marine Institute has played a key and leading role in this transformation in the area of professionalization of the harvesting sector, aquaculture research and development, improved quality systems and the development of responsible fishing practices and technologies.

* Leslie G. O'Reilly

International Engagement

International engagement provides a foundation upon which the Marine Institute's culture and strategic policy have been built. The mission statement explicitly articulates the importance of international involvement and as such MI is engaged in a variety of international education, training, and technical assistance projects related to sustainable utilization of fisheries resources. The Institute has built extensive understanding of international development issues, agency structures and priorities through involvement in more than 60 projects, spanning over 30 countries; from Argentina to Zanzibar.

Funding Sources and Funding Policy Implications

International project funding is secured through a variety of sources. These include the Canadian International Development Agency (CIDA), National Research Council of Canada (NRC), Asian Development Bank, education and training contracts, and private sector or consultancy contracts. Much of the Marine Institute's projects in the ASEAN region have been funded by CIDA and reflect the Agency's Official Development Assistance priorities. Recent funding adjustments at CIDA (entitled the Social Development Priorities) have resulted in an increased programming focus on basic human needs. Though health and nutrition are identified as critical elements in the Social Development Priorities, there is no clear articulation of the importance of fisheries within the framework. Thus, the challenge for the Marine Institute, and other Canadian organizations working in this sector, has been to illustrate to CIDA the vital importance of fisheries within Southeast Asia in terms of daily protein intake and overall health.

Involvement in the ASEAN Region

As articulated above Southeast Asia is a focal point of the Marine Institute's international engagement and development. Current and recent activity includes projects in Cambodia, Indonesia, Thailand, Malaysia, Philippines, Singapore, and Viet Nam. Partnership and collaboration are the keys to the Marine Institute's regional involvement. We form collaborative alliances with government agencies, public and private sector organizations, and non-governmental organizations in order to build on the capabilities of each partner and broaden the experience of all. The themes and sectors of engagement are more fully articulated later in the paper.

Professional Development

Professional development opportunities and exchange programs are woven into all Marine Institute international initiatives. Over one hundred and fifty Canadian technical assistants have been engaged internationally through Marine Institute projects, with the majority being MI personnel. An additional 450 partner country representatives have completed short and long term training programmes at the Marine Institute. Mechanisms have also been put in place to ensure lessons learned from international involvement are channeled back into the Institute's programmes and course offerings.

The majority of Marine Institute programmes provide funded international work opportunities for students and graduates. A Global Graduate Placement Program has been developed at MI with the aim of providing participants with a more global perspective on sustainable aquatic resource management. SEAFDEC has been very involved in this programme having hosted eight MI graduates on six to ten month work placements. Three MI graduates are currently working at the SEAFDEC Training Department and have provided support services for the Millennium Conference.

Three Themes of Sustainability

Our approach to engagement in Southeast Asia focuses on matching the capabilities of the Marine Institute with the defined needs of the ASEAN region in the overall theme of sustainability in the fisheries. In consultation with our partners in this region we have delineated three overlapping sub-themes in this respect: Ecological Sustainability; Community Sustainability; and Sustainability of Relevant Institutions.

Ecological Sustainability

The focus of this theme is on the overall sustainability of the marine and inland fisheries resources. In recent years the Marine Institute has undertaken a paradigm shift in its approach to fisheries development. A decade ago our focus in the area of fish harvesting was on maximizing the efficiency and effectiveness of fishing operations, in aquaculture on optimizing the growth rates of fish and gross economic returns to fish farmers, and in post harvest technologies on processing the maximum landed weight of fish at the lowest direct costs. Today, our former Fishing Technology Unit has evolved into the Centre for Sustainable Aquatic Resources. This centre takes an holistic approach to the harvesting of marine resources and encompasses the fields of Coastal Zone Management, Marine Environmental Management, Responsible Fishing Operations, selective harvesting technologies, sea-bed friendly mobile fishing gear and energy efficiency of fishing vessels. What were formerly separate seafood development and aquaculture units have been consolidated into a single operating centre, the Centre for Aquaculture and Seafood Development. This Centre pursues its activities based upon the common approach that both

wild and aquaculture based fisheries are exploiting aquatic organisms to produce seafood for highly competitive global markets, with an ever-increasing consumer awareness of quality and concerns for the environmental safety of the food that they are purchasing. As a result, our aquaculture research and extension activities, whilst still maintaining a focus on economic efficiency, now also include the integration of operations with other water resource users, assisting with codes of containment and the development of recapture plans, the biosecurity of aquaculture operations, and the maintenance of fish health through preventative rather than curative measures. In post harvest technologies, a large proportion of our activities are based upon the processing sector getting Amore from less, that is to say enhancing yields, improving quality and recovering marketable by-products from hitherto discarded waste streams.

Many of these self same issues have been discussed at length in the technical sessions of this conference. Given our experience and expertise, and the wealth of human and infrastructure capabilities within the ASEAN region, we are anxious to engage in effective partnerships in the region in pursuit of the ecological sustainability of the fisheries that will be of benefit to both our regions. Collaborative projects between the Marine Institute and local and regional organizations to address issues such as responsible fishing, sustainability of fisheries for food security, use of fisheries statistical systems, maximizing utilization and post-harvest technology, quality systems, and environmental friendly aquaculture are areas that address defined needs, are of common interest and can undoubtedly benefit from the synergies derived from inter-regional inputs.

Community Sustainability

The Marine Institute, taking the same approach of effectiveness through stakeholder participation, has, since its establishment in 1969, been involved in community development through education and training at the community level. Just within our own province of Newfoundland, we deliver training courses, workshops and seminars to more than 3000 fish harvesters, fish processing workers and aquaculturists per year. Subject matter covers all aspects of the fisheries from responsible fishing, to food safety, to fish health. We always strive to ensure effectiveness of delivery by targeting the level of the materials at the level of the student base, using adult learning methodologies, and ensuring that the content of the course matches the wants and needs of the clients. The Marine Institute has effectively applied this model in the Southeast Asian region through partnering with local institutions at the community level. Projects are designed and implemented through fully participatory processes, which focus on the fishers, their families and key local organizations. Examples of project activities include co-management projects, community environment action plans, alternate income generation initiatives, community capacity development and responsive training and education programs. The Marine Institute draws on extensive domestic and international experience in community outreach and extension services during project

implementation. We recognize that when we talk about sustainable fisheries, we are really delineating one element, albeit in many cases a critical element, in the food security of rural areas, the maintenance of rural livelihoods and the overall sustainability of these communities. Only through the development of knowledge and awareness in the population at large of the negative impacts on their immediate and long term futures of engaging in unsustainable fishing practices, and by concurrently developing their capabilities and a recognition of the benefits of sustainable development can any effective progress be expected to be made in sustainable fisheries development. At the end of the day, all and any policies will only be effective, when followed or practiced by those who prosecute the fishery or engage in aquaculture. It is encouraging to see that this is well recognized by those involved in the extensive consultative exercises that were integral to developing the content of this conference. I would like to say to the audience today, that the Marine Institute, within its limited capacity, welcomes any opportunities to participate in regional fisheries related activities that lead toward sustainable communities development.

Sustainability of Relevant Institutions

In today’s economies, declining core budgets for public sector institutions are the reality of life. This in effect means that the sustainability of the institutions themselves is compromised. In this connection, organizations can either accept this as a reality and downsize, or, face the challenge and actively pursue other sources of revenue. The Marine Institute will not accept the former option. In as much, we have built a culture of entrepreneurship within the organization, and aggressively seek sources of revenue outside of our traditional core budget from the government. As many of you are aware, for the past decade our traditional fisheries have been decimated, with complete moratoria being imposed on some fisheries, and the TAC’s of others being drastically reduced. What has been the impact on our institution whose principal mandate is to serve the fishing and marine sectors? We have grown dramatically. In fact the government grant to the Marine Institute now only represents some 40% of our total annual budget, the remaining 60% being derived from other external sources. How have we achieved this? We diligently attempted to forecast what the changes in the fishery and the challenges to our rural communities would be, and changed our own strategic plans to meet these challenges.

We recognized that we could not sustain ourselves as just being a post-secondary educational institute, that there were many potential customers for our expertise and capabilities other than residential students, that we could not be “All things to all men@ and that we could not afford to maintain all of the expertise that our clients demanded of us. We needed to either meet their needs or turn them away. We never considered the latter as an option. We developed a culture of partnerships with other organizations that enabled us not only to sustain our position and ourselves, but also grow in both stature and capabilities, as have our

partners. This is clearly demonstrated by our presence here in Bangkok and our support for this conference but more importantly our ability to participate in the downstream activities associated with meeting the targets that have been defined. We are only a small institution, employing some 250 people, and located half a World away.

However, through our partnership with SEAFDEC we are able to pro-actively support your endeavours. The only way that the Marine Institute is able to engage in such international activities is through formal and informal relationships with government agencies, public and private sector organizations, peoples organizations and non-governmental organizations. The overall goal is to build on the capabilities of each partner and broaden the experience of all. Partnerships projects address issues such as Human Resource Development, capacity development, responsive programming, industry-institutional collaboration, instructor training, collaborative research and marketing and business development. An important goal associated with this theme is the increase in regional and inter-regional collaboration. The previously referenced partnership, which exists between the SEAFDEC and the Fisheries and Marine Institute, formalized through a Memorandum of Understanding, is a model example of the mutual benefits that are generated by such collaboration. We hope to be able to further strengthen this partnership over the next several years in order to help sustain and grow both SEAFDEC and ourselves, with the ultimate objective of providing the best possible support in the implementation of any plan of action, which may be developed, from the Millennium Conference.

Strategic Plan of Action:

It is quite easy to “Talk the talk” as we say, but much more difficult to “Walk the walk”. If we, as the Marine Institute are to be able to support SEAFDEC and ASEAN in their pursuit of further developing the fisheries and rural communities in a sustainable manner, and ensuring food security for the future, it is essential that we have a strategic plan in which we can define time-lines and set specific objectives, against which we can apply objective measures in order to evaluate our joint progress. In this regard we have attempted to define the key areas in which we believe we can add value to this ASEAN initiative for sustainability.

Community Outreach.

As has been detailed above, it is our firm belief that the most effective method for developing a culture or philosophy of sustainability in those who have the biggest impact on sustainability itself, the people who engage in fishing activities, is through education, training and technology outreach at the community level. Such outreach activities have to be flexible and responsive if they are to be effective, and targeted not only at today’s adult population, but also at the youth who will be the future practitioners and beneficiaries of sustainable

fisheries. The Marine Institute sees opportunities to support the ASEAN drive towards sustainable fisheries by following the proven models for community outreach that it has successfully applied domestically, and been involved with internationally. These include developing modules in school curricula, developing and delivering short courses and workshops for industry stakeholders and extension workers, technology transfer, and community projects.

Human Resource development.

In striving towards the development of fisheries in a sustainable manner there needs to be the development of an underlying culture of responsibility, ecological awareness, and long term vision by all stakeholders. Key to this is the human resource development of the Afront line troops A who are charged with implementing senior level policies. The Marine Institute has world-class capabilities in this respect. We are highly sensitive to the differences in the learning styles of adult students, the limitations in time availability of employed staff, and the cost implications for the employer of professional development. For these reasons, we have developed education programmes that allow for academic progress through step processes, where each successive year of study earns credits towards the next level of academic achievement. This is further enhanced through continual developments in distance education and distributive learning. These combined enable individuals in the work force to undertake continuing education cost effectively with minimum disruption to their own employment and to their employer. In addition to such accredited academic programmes as Coastal Zone Management, Aquaculture, and Fisheries Development, the Marine Institute can provide assistance in professional development short course and seminars in a broad array of areas associated with sustainable fisheries such as responsible fishing, coastal zone management, seafood quality and safety, or more peripheral areas such as adult learning techniques, “train the trainer” and conflict resolution. Within our limited capacity we will support the stakeholder groups involved in defining, developing and implementing the necessary human resource development plans that are required to make progress in sustainable fisheries development.

Developing Partnerships and Networks.

“No man is an island unto themselves”, and “We cannot be all things to all men”. Two very pertinent maxims to be applied in today’s global village culture, and when addressing an issue as complex and multi-disciplinary as sustainable fisheries development. In their professional development every individual has developed a network of contacts with whom they dialogue and share information. Collectively individuals are what comprise any organization. This is how we view the Marine Institute, not as some 250 discrete individuals, but as a collective of 250 networks of knowledge and expertise. We have an institutional culture that encourages our staff to share these networks with each other and the organization. This builds both

individual and institutional capability, which in turn leads to enhanced credibility. Our institutional view is that there is no room for ‘turf wars’ and protectionism of one’s own empire as these are counter productive to achieving effective results and the attainment of end objectives. Partnerships and sharing require a fully participatory approach involving all parties and must be built upon mutual trust. This emanates from openness, frankness and disclosure between parties, which is perhaps the most difficult hurdle to overcome when moving from a protectionist culture to a partnership culture. However, once trust has been established, then co-operation will naturally ensue. This in turn leads to collaboration from which synergies will be recognized that benefit all stakeholders.

A very simple model that exemplifies the application of partnerships and networks is our participation in this conference. Through our partnership with SEAFDEC we are able to stand here today and play a meaningful role in the conference proceedings. Two MI staff, one of who had previously worked with the Thai National Science and Technology Development Agency for three months during which time he built a significant network of Thai contacts, worked with the secretariat over the summer helping in the conference preparation. This enabled them to build their own personal networks with staff of SEAFDEC, the Asian Institute of Technology, the Thai Department of Fisheries, and the regional fisheries working group, and also to share their own personal networks with all of these individuals and organizations. As previously mentioned we have three interns currently working with SEAFDEC TD who in turn are building their own networks, which we hope they will bring back to our institution. These knowledge networks benefit ourselves, our clients, SEAFDEC and its clients, and all of the individual staff involved.

Never has the World been better equipped for information sharing. We are living in the era of information technology. Building and maintaining a philosophy of information sharing and partnering has worked very well for the Marine Institute and enabled us to spread our wings far beyond the realms of what a small institute such as ours should be able to achieve. I urge those here today that if your organization still maintains a protectionist culture over its own perceived territories, and yet is truly committed to achieving the aims and objectives that have been identified as necessary for sustainable fisheries, then do what ever is within your ability to knock down the walls and develop a culture of partnership and networks. Do not view success as what you or your organization can be ascribed as having achieved, but look at the big picture of how the overall sustainability of the fisheries within the region is advancing, and be proud to say that WE are a part of that. The Marine Institute welcomes the opportunity to share our experiences in building an institutional culture of networks and partnering with ASEAN and SEAFDEC to help achieve your long term objectives and enable us to also say with pride, “We are part of this”.

Leveraging and cost recovery for solution creation.

Integral to our culture of partnering is an entrepreneurial policy with respect to finance. The Marine Institute does not regard its annual government budget as the limiting factor on the size of its operations and a set sum of money to be drawn down against. Rather we view our government grant as collateral to be used to raise funding to support growth and enable us to do whatever we want to do. This requires a significant administrative effort and operating on an initiative driven project-financing structure. This is firmly established with the Marine Institute. We have a saying that “A poor idea needs to seek funding, but that a good idea will attract funding”. The idea of building sustainable fisheries throughout South East Asia is a good idea. It will undoubtedly attract funding to support the drive towards achieving the end objectives.

The concept of leveraging and cost recovery is very often difficult for people who have lived and worked in a public sector institutional setting to grasp. I will use the Marine Institute’s participation in the Millennium Conference as an example. Both SEAFDEC and ourselves could see the mutual benefits of the Marine Institute participating in both the preparation of, and participation in the conference. This was the ‘good idea’, but neither of us had the financial capabilities to make it happen. So what to do? The Marine Institute could see the downstream benefits to its students and industrial clients of enhancing the capabilities of its staff in international sustainable fisheries development. In this regard we were prepared to support some of the salary and associated cost requirements necessary for our participation. We discussed the downstream benefits that would accrue to our industrial clients with the National Research Council of Canada, a technical and funding support agency dedicated to industry technical development. They agreed that this was a ‘sound idea’ that would benefit their industry clients through the dissemination of the knowledge acquired and agreed to help support the Marine Institutes costs. SEAFDEC could see benefits from the involvement of the Marine Institute’s expertise in sustainable fisheries but could not afford to pay for this expertise in its entirety. However, it was within their financial capabilities to assist with the transportation and accommodation costs of the Marine Institute staff. As a result we achieved all of our mutual objectives within the financial capabilities of each partner by using base budgets to lever additional funding to support the activity.

As was noted above, our base budget only represents some 40% of our total annual operating budget. The above example is just one small example of how we use our government grant as leveraging collateral. In order to support our work with external clients, we recover the salary costs of MI personnel including the administrative support and the project operating costs through charging for our services on an actual cost plus operating overhead basis. In effect this operates similarly to a consultancy.

In general terms we view project funding as the catalyst that drives good ideas and effective delivery of service, not that acquiring the necessary funding is the end objective in itself. We have found this approach to be highly cost effective, and our clients and the funding agencies that support us overwhelmingly agree that they see ‘value for money’ in projects in which the Marine Institute is involved. The bottom line is that leveraging and cost recovery enable us, and any organization that adopts the same principles, to effectively achieve solution creation for defined needs.

The Marine Institute believes that our approach of working with partner organizations throughout the South East Asian region, supported by collaborative funding mechanisms, can help to achieve the regional objectives of sustainable fisheries development and food security.

Summary

In conclusion, I would firstly like to thank the organizers of this auspicious conference for having given me the honour and the opportunity to share with the audience the Marine Institutes policies and institutional culture and philosophies with respect to our future role in fisheries development within the region.

Hopefully I have been able to convey to you our commitment of support. We firmly believe, and sincerely hope that you do, that our expertise in post secondary education, in extension education, in fisheries, aquaculture and post harvest technologies, but perhaps most importantly our culture of partnerships with local organizations and institutions, can assist you in your downstream endeavors.

Thank you.

MEKONG RIVER COMMISSION (MRC)

MRC Policy on Sustainable Fishery Development in the ASEAN Region*

Introduction

The food security of 60 million people living in the Lower Mekong Basin (LMB) is based on rice and fish. Rice is the main supplier of energy and plant protein in the diet, and fish supplies a range of important micro-nutrients and animal protein. There are no immediate replacements for these two important food components, on which many south-east Asian societies have developed. Any substantial and irreversible damage to the ecosystems in the region may lead to severe shortages in food production.

The inland fishery resources of the LMB are among the most productive in the world, and are of immense importance to the people in the region. The annual flooding of the Mekong Basin drives the productivity. The rise and fall of the Mekong also creates the variety of habitats which shelter an incredibly diverse fish fauna. More than 1200 fish species live in the Mekong and its tributaries, making it one of the most speciose rivers in the world.

Care is needed if we are to maintain the aquatic resources and biodiversity of the Mekong for future generations. The long term sustainability of the living aquatic resources of the LMB as an important source of food, income and employment will require extensive knowledge of the resources and of key factors controlling recruitment and survival, such as life history, habitat and migration route requirements. It will also require that the living aquatic resources are taken into account in national and regional planning, especially in Government where decisions are made on alternative uses of water resources.

Fishing communities must also take action to manage fisheries, protect habitats and avoid over-exploitation of resources. The aquaculture potential needs to be developed in order to create income for small-scale fishers and increase food production to cater for the rapidly increasing population. With an average population increase in the LMB of 2% per annum, fish production must increase by about 30-40,000 tonnes per annum to maintain the present level of fish consumption. This increase can only come from aquaculture.

* Jeanineke Dahl Kristensen, Manager, Fisheries Programme, Mekong River Commission, PO Box 1112, Phnom Penh, Cambodia

The MRC Fisheries Programme has been created by the four riparian countries, namely Lao PDR, Thailand, Cambodia and Viet Nam. Its overall objective is "the coordinated and sustainable management, use and development of the economic and nutritional potential of the living inland aquatic resources in the Mekong River Basin". Today, the Fisheries Programme is active in all four countries. Its implementation is through the four line agencies for fisheries and their research and development institutions, with international professional assistance and financial support from international donors.

Policy Aspects

The Programme for Fisheries Management and Development Cooperation rests firmly on the national policies of the riparian countries, and all activities supported through the MRC Secretariat must be coherent with the national policies. The following policy aspects, which were formulated at the First Annual Meeting during the planning phase of the Programme, are adhered to in the current development and implementation of the Programme.

- ♦ MRC Fisheries Programme Components shall be regional in character or have regional significance. That is, the activities considered should involve more one riparian country or, if national, have basinwide importance.
- ♦ Support leading to the management of the capture fisheries resources on a sustainable basis shall be given high priority. A resources systems framework should be developed including social and economic factors in order to facilitate programme planning and component development in the aquatic resources sector.
- ♦ Aquaculture development shall be supported where, at the same time, the need for such assistance may not be covered by other institutions or organizations; where there is a comparative advantage in channeling the support through the MRC Fisheries Programme; and where aquaculture is an important component of the water-based resources system. Support to upgrading the capacity of national fisheries institutions shall be integrated with Programme components aiming at the management and development of the natural resources, in order to strengthen the role and capabilities of the institutions in planning, implementing and ensuring sustainability of such component.
- ♦ Programme components shall be planned in close cooperation with the relevant national institution for later implementation through these. In this context, assistance may also be channeled through permanent regional NGOs cooperating with the national institution if this may enhance the sustainability of the results.
- ♦ Social consideration shall be given to the determination of the final beneficiaries of the Mekong Fisheries Programme, in order to enhance the socio-economic development and make full use of the development potential. Small-scale farmers and other low-income groups will be the final target groups for the inland aquaculture development, and culture

technologies promoted shall not include factors related to technical complexity or requirements for capital or other, which exclude these farmers from adapting them.

- ♦ Gender perspectives in fisheries must be mainstreamed in order to ensure that men and women benefit equally from the development, according to their different needs and with the input and equal participation of men and women at all levels.
- ♦ A livelihood approach, centered on the small-scale farmers and fisheries in the basin, will be aimed at through the coordination and cooperation with other sector programmes and through adopting a catchment approach as the common planning framework.

Current and Planned Components of the Fisheries Programme

The Programme consists of several components operating across the two main sub-sectors of capture fisheries and aquaculture, as well as multi-sectoral or "cross-cutting" activities.

1. Capture fisheries and Aquatic Resources

The objective for this sub-sector is "Fisheries management systems established ensuring sustainable economic utilization and conservation of the bio-diversity; and national research and development institutions meeting the needs for planning, research, management and information dissemination in order to sustain these achievements in a regional cooperation".

Three components are operating in this sub-sector. They are:

Management of freshwater Capture Fisheries of Cambodia;

Management of Reservoir Fisheries in the Mekong Basin; and

Assessment of Mekong Fisheries – Migration and Spawning and Impact of Water Management.

2. Small-scale Aquaculture Development

The sub-sector objective is "Farmers' incomes raised through development of the potential for economic and sustainable small-scale fish production; and national fisheries institutions meeting the needs for aquaculture planning, research, development and extension in a regional cooperation in order to further pursue this goal".

The two components operating in the sub-sector are:

- ♦ Rural Extension for Aquaculture Development in the Mekong Delta; and
- ♦ Aquaculture of Indigenous Mekong Fish Species.

3. Cross-cutting Activities

These are components that operate across both fisheries sub-sectors, and are also integrated with other natural resource development activities undertaken by MRC and other organizations. They are:

- ♦ Strengthening of Inland Fisheries Information Systems (to be initiated in early 2002);
- ♦ Sesan-Srepok Fisheries Management and Development; and
- ♦ Nam Ou Fisheries Management and Development. (The last two are proposals for which MRC is currently seeking financial support).

Collaboration with the Fisheries Sector in the ASEAN Region

Broadly speaking, the MRC Fisheries Programme is very keen to collaborate with all other organizations working in the fisheries sector in the Mekong Basin. As previously stated, the fisheries in the region are of immense economic and nutritional importance, the resources are under pressure from varied sources, and consequently the management and development needs of the sector are immediate and important. In this context, it is apparent that coordination of activities across governments, research, development and management institutions, donor agencies and NGOs is essential to ensure best use of the limited resources available.

There are several areas in which the MRC sees a particular need for multi-institutional activity. One is in establishing the nutritional importance of living aquatic resources to the people of the Mekong Basin. Comparatively little work has been undertaken to date in this field. Despite this, it is apparent that these resources are needed to supply essential micro-nutrients and animal protein, as the people of the Mekong Basin have no alternative sources for these nutrients. Firmly establishing the nutritional importance of the various aquatic resources would assist in focusing management initiatives, and provide further justification for their long-term maintenance. Similarly, an understanding of the post-harvest treatment and use of fish may well shed new light on quality and nutrition of various products.

There is little information available in the region on trade of aquatic products, both nationally and internationally. This includes information on, how many times are fish sold before it is consumed? Quantification of the trade in aquatic products is necessary for developing a realistic valuation of the fishery, which in turn is essential information for decision makers.

Health management of aquatic resources in the Mekong Basin is becoming increasingly important with the further development of aquaculture and the movement of fish for commercial purposes. We note there are already some initiatives in the field of aquatic health management, and MRC is keen to build on these especially in the components focusing on catchment management.

Information dissemination is an area of development work that can never be overdone, but unfortunately it is sometimes not adequately catered for. MRC has recently undertaken a range of initiatives to communicate the results of its work, especially to decision makers within government. However, a multi-institutional approach would be beneficial to all, as would further analysis and thereafter refinement of the communications methods employed to achieve our objectives for aquatic resource management in the Mekong Basin.

NETWORK OF AQUACULTURE CENTRES IN ASIA-PACIFIC (NACA)

NACA's Policies and Programmes in Aquaculture Development: In Support of the ASEAN Vision 2020*

ASEAN Vision 2020

The overall thrust of the ASEAN Vision 2020 is “*Enhancing Food Security and Global Competitiveness of ASEAN's Food, Agriculture and Forestry Products.*”

How does NACA's regional program fit into the overall scheme of attaining these two key objectives of *food security* and *global competitiveness*? The quick and easy answer is to say that ASEAN and NACA have recently agreed via an exchange of letters to cooperate in

- a. The general area of rural development and in the more specific fields of
- b. aquatic animal health and
- c. aquaculture education.

But this does not tell us how NACA's work program supports the ASEAN Vision.

The answer might be more clearly drawn by looking at the impediments to reaching a sustained level of food security and the factors that blunt efforts to sharpen competitiveness in the global arena. The remit of NACA dictates looking at the issues from the perspective of aquaculture development and aquatic resources management, though it does not preclude looking at them beyond the boundaries of the sector. The complexity and interactions among the issues actually compels one to view them in a systematic and holistic way.

Broadly, the situation in most of the region is that aquaculture is now more organized with increasing state patronage but also greater private sector participation. Productivity has increased faster than any other agricultural commodity largely from the better application of technology and technical and management skills. Increasing levels of production has improved the general availability of food to the population and increased the export earnings of national economies. It has generally contributed to better health and nutritional well being of people, and improved their income. There is a growing sensitivity to the fact that practicing socially and environmentally responsible aquaculture makes good business sense.

* Pedro Bueno, NACA Coordinator

On the negative side of the equation, intensified production has begun to stress the land, water and biological resource bases impairing their capacity to continue to support production. More crucially, higher production has not been shown to significantly reduce rural poverty; conflicts over resource use simmer, occasionally flaring up to strain the management and regulatory capacities to deal with them. Promoting cohesiveness and harmony in the face of diverse interests, with the poor and weak often getting ignored, has begun to expose weaknesses in policy making and governance. Finally, there is yet to be a clear understanding and concerted action to better address the difficult issues faced by the production and marketing of products in highly competitive markets where it is essential to assume responsibility not only for the quality of the product but for the actions taken, or not taken, in producing it.

This broad assessment underlines the difficulty of developing a strategy that comprises technological fixes and institutional solutions. What they are, how to develop them or even where to obtain them are generally well known. When and which problems to apply them is more problematic.

It is in this context that I would like to describe the genesis, the basis, the attributes and the elements of the work program of NACA and the areas in this program that support ASEAN members,

Work Programme 2001-2005

This is the third Five-Year Work Programme of NACA since it became an independent intergovernmental organization in 1990. It is the first in this millennium. The Programme has two basic roles: bridge the past 20 years and the next 20 and set the stage for the development of aquaculture in the region for the years ahead. Since NACA became operational, as a project of FAO and UNDP, in 1980 (the establishment of NACA was proposed as one of the concrete steps in the Kyoto Strategy developed by the FAO Technical Conference on Aquaculture in Kyoto in June 1976), the past 20 years have seen Asian aquaculture evolve from a traditional practice to a science-based activity and grow into a significant food production sector.

Basis of the Work Programme

The three major guides for the direction and content of this Work Programme are, in the order of their occurrence:

- i. the Asian Regional Aquaculture Development Plan prepared by the Regional Planning Workshop on Aquaculture Development held in Kanchanaburi, Thailand in September 1999;
- ii. Declaration and Strategy for Aquaculture Development beyond 2000, formulated by the Global Conference on Aquaculture in the Third Millennium held in Bangkok in February 2000; and
- iii. Report of the NACA Task Force, an independent group of experts mandated to recommend ways to strengthen the Network Organization; it visited and consulted 19 nations from in August and September 2000 and developed an analysis of the Organization's strengths, weaknesses, opportunities and threats. The Governing Council in its 12th Meeting in December 2000 adopted the report.

Four attributes of the Work Programme

Thrust: The Work Programme emphasizes rural development, focusing on the social and environmental objectives of reducing poverty, ensuring food security, enhancing livelihoods, wisely managing aquatic resources, promoting a healthful environment and healthy aquatic animals, and improving manpower management and technical skills.

Pillars: The Programme is based on building capacities through better education and training and improving support to policies and institutional capacities, facilitating effective research and development by collaborative networking among centers and individuals; facilitating the sharing of information by especially relying on new information technology.

Working Principle: The work program gives coherence and instills relevance to the various efforts to assist governments develop and implement their aquaculture programmes by reflecting their viewpoints and needs.

Guideline for cooperation: The work program is guided by an outlook towards regional cooperation that aims to provide a forum and facilitate the process for stakeholders to act as partners with governments, add value to each other's efforts, and collectively own the decisions and policies, therefore drawing stronger commitments from every partner to contribute to the common objective.

Four examples from the Work Programme

To illustrate the above attributes as well as explicitly demonstrate NACA’s support to the ASEAN Vision, I will describe four initiatives under the Work Programme.

a. *STREAM: Support to Regional Aquatic Resources Management*

STREAM aims to improve the livelihoods by strengthening the capacity for poor farmers and the rural poor depending on aquatic resources for a living. This is done by enabling them to take a more active part in the search for solutions to their livelihood problems, getting their inputs into research designed to improve their lot, and having their voices influence policy.

Founded by NACA, DFID, FAO and VSO (Voluntary Services Organization, an international NGO) STREAM aims to offer support to the livelihoods of poor peoples who manage aquatic resources (via management of aquaculture or capture of fish or aquatic resources). STREAM will operate initially for 5 years and has been launched. It will pilot in Vietnam and Cambodia in year one expanding 6 more in year 2 and eventually covering all members and participants of NACA. It is funded by a trust fund and has seed funding from DFID and Asia-Pacific governments. Any stakeholder is welcome to participate in STREAM as a partner. There have been expressed interests from the World Bank and IDRC.

b. *Aquatic Animal Health Management in Asia-Pacific*

Under the Asian Aquatic Animal Health Program, FAO, through a Regional Technical Co-operation Programme (TCP) Project assisted NACA Governments in developing a regional policy to undertake responsible introduction and transfer of aquatic animals. The program-developed strategies that minimize the potential health risks associated with live aquatic animal movements and in accord with relevant international agreements and treaties, including SPS agreements of WTO and OIE. The Regional TCP, implemented by NACA in 1998, in cooperation with designated National Coordinators of 21 participating governments, regional and international experts, and regional and international organizations (OIE FDC, OIE Tokyo, AAHRI, AusAID/APEC, and AFFA), became the focal point for a strong, multi-disciplinary *Asia Pacific Regional Aquatic Animal Health Programme*.

The ‘*Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals and the Beijing Consensus and Implementation Strategy*’⁷, the supporting ‘*Manual of Procedures* and ‘*Asia Diagnostic Guide* were developed through consensus building and consultations among relevant stakeholders. The ‘*Technical Guidelines*’ was adopted in principle in June 2000 by participating governments and by the 9th Meeting of

⁷ FAO/NACA. 2000. *Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals and the Beijing Consensus and Implementation Strategy*. FAO Fisheries Technical Paper. No. 402. Rome, FAO. 2000. 53 p.

the ASEAN Fisheries Working Group in September 2001. The *Asia-Pacific Quarterly Aquatic Animal Disease Reporting System* and the Asian chapter of *Aquatic Animal Pathogen and Quarantine Information System (AAPQIS-Asia)* were established under the same cooperative mechanism. The *participating countries also developed the National Strategy on Aquatic Animal Health Management* and they are expected to be integrated into national development programs of countries.

A major step in moving forward the implementation of the '*Technical Guidelines*' is the establishment of the *Asia Aquatic Animal Health Advisory Group (AG)* – an official regional expert group, institutionalized under the inter-governmental organization of NACA, to provide advice to Asian governments in implementing (and monitoring) the '*Technical Guidelines*' and aquatic animal health issues within Asia. The principal objective of the ADG is to support governments in projecting a strong and coherent approach on aquatic animal health management for Asia.

This program activity has sensitized donors and development agencies to assist in the implementation. APEC continues to provide valuable assistance. The Mekong River Commission Fisheries Programme, for instance, is giving priority to the development of a basin-wide strategy for controlling aquatic animal diseases in shared watershed among Mekong riparian countries. Other related initiatives that have been done included or are being initiated include the harmonization and inter-calibration of Asian regional diagnostic techniques, farm level health management, mollusk and marine finfish health, genetics and breeding for disease resistance) are being pursued with other interested partners.

Additionally, the lessons and experiences from the activity regional TCP influenced and initiated activities in other regions are helping FAO establish a regional program on shrimp health for Latin America, fostering linkages between Asia and Latin America through South-South Co-operation.

c. Consortium on Shrimp Farming and the Environment

To support analysis and sharing of experiences on better management practices of shrimp culture, NACA, FAO, the World Bank and the Worldwide Fund entered into a Consortium Program on Shrimp Farming and the Environment. The program activities were carried out in three continents, Asia-Pacific, Africa and the Americas. NACA was responsible for collecting experiences on better management in Asia. The results of the program will provide a basis for formulating a code of conduct on responsible shrimp culture now under consideration in FAO.

The objective of the Consortium Program is to identify better management practices under various environmental, economic and social conditions and assess the cost-benefits for farmers to adopt these practices. NACA anchored the program and in Asia worked with various kinds of entities that included national centers, NGOs, and government authorities.

d. Regional collaborative program on Aquaculture Education

It is all very well to plan and pursue research and development activities. But without the skilled manpower to implement them, their momentum would grind to a halt.

The development of a network of regional training and education providers is considered an important, cost-effective strategy that will enable countries to build up human resources in a coordinated manner. A cooperative mechanism, comprising a formal networking of key aquaculture education institutions in Asia, providing high quality aquaculture education, is being developed and the blueprint for it has been drawn in a Asia-Pacific-wide consultation held in Hanoi in May 2000 followed by a smaller expert working group meeting also in Hanoi in November 2001. The program framework and detailed implementation strategy, involving formal qualifications (possibly leading to a "Regional Aquaculture Degree"); credit transfers, delivery in the distance mode, use of Information Technology (IT), has been drawn up based on recommendations arising from the APEC project "Cooperative Education Programme".

Apart from their development objectives, these four programs described above show that a broad-based participatory multi-institutional collaboration could multiply benefits to governments and peoples. They demonstrate how cooperation in areas of mutual interests effectively musters resources, expertise and institutional support to implement regional projects, promoting synergy, avoiding duplication of activities, and expanding the range of beneficiaries.

An Asian Regional Aqua farmers Network

Six years ago at the Beijing Workshop of the NACA/ADB regional project on aquaculture sustainability and the environment, the farmer representatives requested NACA to assist in the formation of a regional aqua farmers network. We approached this by making a survey of national and local farmers federations, associations, and groups in 16 Asia-Pacific countries. A compendium of this survey is now with NACA consisting at present of almost 400 associations and groups with a combined membership of more than 400 thousand.

In January 2002, we have invited farmers and aqua business people to a Seminar that will run concurrently with the Governing Council meeting (in Langkawi island in Malaysia) with the

expectation that the regional Aqua farmers and Aqua Business Seminar will catalyze the formal organization of the Regional Aqua farmers Network.

This will actively bring into the regional work program the participation of the region's farmers.

Better, Less Expensive Networking

NACA is intensifying its use of Information Technology, primarily to enhance cooperation by bringing into the regional programs more intellectual inputs and resources without spending a lot more money.

A large factor that has contributed to the success so far achieved by NACA is the cooperation among governments and the coordinated participation of national institutions, centers and agencies in regional activities. Coordination has facilitated the operation of numerous and diverse activities, enabled the pooling of scarce national resources and the widespread and equitable sharing of results.

The resources existing in the region that can be brought to bear on aquaculture development are enormous. The scientific, technical and managerial talent within the Asia-Pacific Region is varied and rich. Getting this vast reservoir of human and physical resources applied and focused on regional priorities would greatly accelerate the expanded development of aquaculture regionally and within states.

Their impact on development would even be much greater if the activities and exchanges could be made speedily. For example, information on imminent threats (such as disease outbreaks, red tides, water quality changes, and storms), that can be obtained in real time are always more useful and effective. Policy formulation and management decisions are always more reliable with timely, accurate and broad-based and in-depth information. Interactivity among sources and users of information, and easy access to a wide range of information sources (including technical, economic, and policy) will increase the value and impact of information and knowledge. Upgrading of skills can be accelerated with a speedy search and delivery of quality training and educational resources. Development and coordination of projects will be greatly facilitated.

The above attributes of an effective and economical regionally coordinated effort can be provided by the new Information and Communication Technology. We have begun to enhance our present regional information system -- which now includes data bases that support specific projects as well as special and general information packages -- into a more

comprehensive system that will provide three basic services: (i) One-stop and interactive shop for acquiring and exchanging information as well as jointly developing information packages, (ii) Gateway to a wide range of sources of information and knowledge, (iii) Forum for focused and systematic interactions and discussions to identify, clarify, and/or resolve urgent and common issues. ICT is intended to complement the traditional means of effecting coordination, delivering information and education, and fostering interactions among people taking part in network activities. It is not a substitute, but it is now the only known option to cost-effectively carry out a people-oriented and project-expertise oriented networking mode.

More than the infrastructure and systems, NACA's Information program will develop the digital literacy and national capacities for accessing and assessing information resources by the knowledge workers and information technologists working in aquaculture and aquatic resources management and development in members, particularly the less developed ones.

This move draws its rationale from the fact that resource-poor countries can (and traditionally have been shown) to benefit cost-effectively from accessing, borrowing and adapting technologies from elsewhere. They need not spend their scarce resources reinventing the wheel; and information technology will now allow technologists from poorer countries quick and easy access to a broader range of information and technology.

From the organizational perspective, the upgrading and strengthening of national manpower and facilities has created a multiplier effect for various assistance programmes. The multiplier effects include the wider dissemination of results, assurance of follow-up activities within governments, ensuring continuity of project-initiated activities in the NACA program of work, and utilization of strengthened national institutions by assistance programmers. The net result is intensification of regional efforts. A list of selected projects to illustrate the added impact of collaborative and coordinated action under NACA appears as Annex 1.

NACA has generated support for the implementation of major regional and national activities from bilateral, multilateral and investment agencies. The details of these activities and the national, regional, and international agencies involved are listed in Annex 2. The list illustrates the breadth of multi-institutional collaboration that NACA has been able to facilitate, through the participation of various partners in specific activities that match their respective agenda but meet common needs. This list shows very clearly that investments of donors and NACA governments have generated considerable multiplier effects.

In closing, NACA looks forward to a continuing and closer participation – as a partner with ASEAN and SEAFDEC, FAO, APEC, MRC, the various development assistance organizations, and national governments – in implementing the action plan under the

ASEAN Vision 2020, including the ones that are now going to be adopted by this ongoing Conference.

Regional and Sub-regional Projects Illustrating Added Benefits from NACA’s Coordinating Role

1. Assistance to Safe Tran boundary Movement of Live Aquatic Animals in Asia

Provides a single unified platform -- on the development of technical guidelines for quarantine, certification and reporting -- for several agencies to collaborate with governments in addressing multiple but related issues ranging from stronger capacities for diagnostics, prevention and control; more reliable and effective national information systems for decision-support on the causes, origins, seriousness and control of epizootics, and a region-wide information exchange system. It also enables other countries to benefit from a national institution participating in the project that has been strengthened by a bilateral program into a regional center of excellence (i.e. AAHRI).

2. Aquaculture Farm Performance Study -- Enabled the collection, analysis, organization, processing and rapid delivery of an extremely large amount of farm-level data and information from several (16) countries to guide actions at different operational levels – i.e. farm, farming community or region, agency, national, supra-national; enables quick access to these data by intermediate users of information for various other purposes. The recommendations - embodied in the publication “Aquaculture Sustainability Action Plan” -- have formed the basis for government policy, legislation and management plans for sustainable aquaculture development.

3. Mixed farming systems in Mangroves -- Multiplier effect: provides a regional spread to the results of a national-level activity through the regional information exchange and links to other sub-regional and regional projects under NACA. It is now being fed into training and extension not only in the country in which it was conducted (Vietnam) but in other countries as well.

4. Tropical Coastal Ecosystems Project -- Also a multiplier effect – providing regional spread to the benefits derived from the methodologies and results of a sub-regional project through training, information exchange and links to other network activities, such as Environmental Impact Assessment, rural aquaculture, coastal resources development and management

5. Grouper Regional R and D Network -- Enables the coordination of and sharp focus to separate research and development efforts of individual workers and institutions located in

various countries to crack, in a concentrated manner, a technical problem that has been the major bottleneck to mass seed production.

6. Formulation of a Master Plan for Aquaculture Development, Sabah, Malaysia --

Three major features can be cited from this bilateral project – the coordinated use at a very cost-effective manner of regional expertise to develop the Plan, the continuing (as opposed to a one-time) assistance provided to a member government of the activities recommended by the Plan, and the expansion of one regionally relevant aspect of the Plan – namely reef fish management and culture – into a full-blown regional project on grouper research and development.

**Programmes and Projects Under or With NACA
as a Major Participant 1990-2001**

The following provides a list of the regional, sub-regional as well as national projects and activities undertaken by the Intergovernmental NACA Organization. The FAO/UNDP Regional Seafarming Project Phase 2 (Jan 1990-Dec 1991) provided assistance to the then newly independent NACA organization

1. 1990. Regional study and workshop on Fish Disease Control Health Management (with Asian Development Bank). Established firmly the links between environment and aquatic animal health, quantified economic losses from fish diseases, and identified areas for the region and countries to strengthen their capacities at aquatic animal health management.
2. 1992-94. Regional study and workshop on the Taxonomy, Ecology and Processing of red seaweeds, with FAO, the Government of France, and Kasetsart University.
3. 1993-94. Assessment of abandoned shrimp culture areas in Thailand, with Coastal Resources Institute, Prince of Songkhla U and National Economic and Social Development Board of Thailand
4. 1993-95. Two studies on environmental impact assessment of shrimp farming (carried out in two ecological systems, mangrove and crop lands) with the Office of Environmental Policy and Planning, Government of Thailand
5. 1994. National Workshop on Aquaculture Development and the Environment with Govt of Vietnam and participation (sourced and arranged by NACA) of FAO's legal office, FAO RAPA, EU-project for returnees in Vietnam, Mekong River Commission, CP (private sector), and "Feed the Children" Programme.
6. 1994. Capacities and Needs Matching in Sustainable Coastal and Inland Fisheries and Aquaculture Management with UNDP and Myanmar
7. 1994-95. Environmental Assessment and Management of Aquaculture Development, with FAO
8. 1994-95. Regional Study and Workshop of Aquaculture Sustainability and the Environment, with ADB

9. 1994-96. Key Research Issues in Sustainable Coastal Shrimp Aquaculture with ACIAR, CSIRO, Kasetsart University, and DOF, Government of Thailand
10. 1995-97. Master Plan for Coastal Aquaculture Development for Sabah, Malaysia with the Government of the State of Sabah, Malaysia and UNDP
11. 1995-96. Establishment of Aquaculture Microprojects under the Human Development Initiative program of UNDP (with FAO, UNDP and UNOPS)
12. 1995-96. Survey of Aquaculture Development Research Priorities in Asia, with FAO
13. 1995-96. Survey of Water Pollution Sources and Coastal Aquaculture in Thailand, with the Department of Pollution Control
14. 1996. Regional Workshop on Aquaculture and Management of Coral Reef Fishes and Sustainable Reef Fisheries with UNDP and Government of Sabah, Malaysia
15. 1996. Regional Workshop on Health and Quarantine Guidelines for the responsible Movement of Aquatic Organisms (with FAO and AAHRI) and Working Group Meeting on Regional Fish Disease Reporting System with OIE, AAHRI and SEAFDEC AQD.
16. 1996. Regional Workshop on Legal and Regulatory Aspects of Aquaculture in India and SEAsia, with International Law Institute, Rockefeller Brothers Fund, and Kasetsart University
17. 1996-97. Phase 1 of Mangrove Mixed Farming Systems (Socio-economic study of integration of shrimp culture with mangrove ecosystems in the Mekong Delta of Vietnam) with ACIAR, AIMS and Government of Vietnam; Phase II is ongoing and it aims to extend the research results of Phase 1 through training, information and extension activities.
18. 1997. Epidemiological study of EUS, Pakistan with AAHRI ACIAR, DFID
19. 1997. Study of Mangrove Aquaculture Interaction, with Government, Academic, Private Sector and NGO participation)
20. 1997. Study on Food Safety Issues Associated with Products from Aquaculture with WHO and FAO

- 23 1997-99. Danish/South-East Asian Collaboration in Tropical Coastal Ecosystems Research and Training Project.
- 24 1998 - ongoing. APEC/NACA Grouper Aquaculture R and D Network with collaboration of ACIAR, SEAFDEC Aquaculture Department, and numerous national institutions and individuals from Asia and the Pacific. A Grouper Electronic Newsletter is published and disseminated through the Internet for exchange of information among the participating individuals and institutions.
- 25 1999- ongoing. Good Management Practices for Sustainable Shrimp Aquaculture, case studies to identify elements of good practices; also involves institutions in Latin America, Central and North America and Africa. Includes assessment of mangrove management practices. This is a project that spans Asia, Africa and Latin America involving a consortium of partners: FAO, WWF USA, World Bank, and NACA with the participation of national and regional organizations and NGOs in the 3 continents.
- 26 2000. Shrimp Disease Control and Coastal Management, with India's MPEDA, results to be fed into the above project as well. With NACA, MPEDA and ACIAR.
- 27 Expert Consultation on the Research Needs for Standardization and Validation of DNA-Based Molecular Diagnostic Techniques for the Detection of Aquatic Animal Pathogens and Diseases, jointly organized by FAO, NACA, ACIAR, CSIRO and DFID, 7-9 Feb, 1999
- 28 Assessment of socio-economic costs of aquatic animal diseases in aquaculture with FAO.
- 29 "Primary Aquatic Animal Health Care in Rural, Small-Scale Aquaculture Development in Asia" held in Dhaka, Bangladesh from 27-30 September 1999, co-sponsored with FAO and DFID and hosted by the Government of Bangladesh
- 30 Workshop on Aquaculture Nutrition and Environmental Health Management for the Sustainable Intensification of Freshwater Food Fish Production in South Asia, scheduled for November 2001, with NACA, FAO and India's CIFA.
- 31 1998-2000. Regional Technical Cooperation Programme "Assistance for the Responsible Movement of Live Aquatic Animals in Asia" which has catalyzed the regional program on Aquatic Animal Health Management of NACA. involves 21 governments and multi-agency collaboration, started in January 1998 and successfully terminated in June 2000

with the final workshop held in Beijing with the adoption of the Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals and the Beijing Consensus and Implementation Strategy. Other important components involved institutional strengthening, training and an information system (Aquatic Animal Pathogen Quarantine Information System or AAPQIS).

- 32 Aquaculture Conference in the Third Millennium and Aquaculture and Seafood Fair 2000, 20-25 February 2000. Attended by around 600 from nearly 70 countries representing over 200 organizations; came up with a guide for aquaculture development in the next 20 years in the "Bangkok Declaration and Strategy for Aquaculture Development beyond 2000." NACA and FAO collaborated in the Conference, which was hosted by the Government of Thailand.
- 33 2000. Cooperative Aquaculture Education Programme for the Asia-Pacific with APEC assistance for the study and workshop. The Hanoi Workshop held in May 2000 recommended an Aquaculture Education Consortium that will develop as well as participate in a regional education program for aquaculture at various levels. A Strategy for Aquaculture Education was formulated. Distance education and its delivery through Information Technology are seen as a cost-effective option in the new Millennium. With NACA and Deakin University, involving also the participation of national agencies and academic institutions, among them Fisheries Department of Fiji and the University of South Pacific.

A very recent (Nov 12-14 2001 also in Hanoi) working group of experts meeting (that included experts from Universities, Training and Education Centers, Donor agencies, NACA and ASEAN) Hanoi has developed the implementation plans for the Aquaculture Education

- 34 2001. Support to Regional Aquatic Resources Management, developed through and being implemented initially by a coalition of partners that include DFID, FAO, NACA and an international NGO, the Voluntary Services Organization. This had its genesis from the 1998 NACA-initiated concept "Aquaculture for Sustainable Rural Livelihood Development (ASRLD). It will be launched in December with initial funding support from DFID.
- 35 2001. Aquaculture Alliance in the Lao PDR, an alliance that would generate, provide, facilitate funding and/or technical assistance to Laos, which includes NACA, ICLARM, AAHRI of the Thai Department of Fisheries.
- 36 2001. Plans for a TransHimalayan Network of Coldwater Fishery and Fishery Resources – which is focused on poverty alleviation, resources management and environment – involving

the countries bordering the Himalayan ranges were laid down in a regional workshop in Kathmandu in July 2001 that was attended by South Asian country and China representatives, academics, experts from Mekong River Commission and Thailand, and supported by various organizations that included WWF, IUCN Nepal, EU projects in Nepal, a Professional Fishery Association, and FAO and NACA.

- 37 2001. Intensification of Food Production through Freshwater Aquaculture. The expert consultation, held in October at NACA's regional lead center in India (CIFA) and organized by FAO, NACA and the Center identified technical, strategic and policy issues that constrain producing more food through freshwater aquaculture, and recommended specific follow up actions to resolve the water, feed and seed and animal health issues.

**SOUTHEAST ASIAN PROGRAMME IN OCEAN LAW, POLICY AND
MANAGEMENT (SEAPOL)**

SEAPOL and Regional Cooperation in Fisheries*

Mr. Chairperson, fellow-panelists, distinguished guests and participants:

I am honoured to have the opportunity to present here to you the work of SEAPOL, especially its work in regional cooperation in fisheries in the region. I would like to thank SEAFDEC for inviting SEAPOL to collaborate in this very important event. SEAPOL has been around for quite some time and I saw many good friends of SEAPOL in the audience. Yet, because of its low profile, many of you may not have heard about us. SEAPOL is the acronym name for Southeast Asian Programme in Ocean Law, Policy and Management.

SEAPOL is not a research institute but it carries out research. It is not a governmental institute yet most of our projects worked closely with governments and high officials in the region. SEAPOL is not a teaching faculty but we offer training courses and seminars, ranging from boundary-making to environmental protection. SEAPOL is not a publishing house but throughout the years we published a considerable collection of literature on ocean law, policy and management, with a focus on Southeast Asia. We are not donor organization and yet some regional experts and institutes seek our assistance in obtaining fundings for capacity building purposes.

What is SEAPOL? SEAPOL is the world's oldest and largest network of experts in the field of ocean law, policy and management. It is a tested neutral forum for non-official exchange of ideas and it is an accepted platform of project delivery. SEAPOL was established in 1981 in anticipation of the successful conclusion of UNCLOS III and was mainly funded by Canada for the past 20 years, first by IDRC and later by CIDA. The initial goals were to facilitate the implementation of UNCLOS III in the Southeast Asian countries and to provide a neutral forum for officials, academics and professionals in ocean affairs. As time passed, the scope of its work has been expanded to include new developments since UNCLOS III, such as Agenda 21.

As a network of experts, it provides a focal point for people studying and working in the field of ocean affairs to interact with each other. In the past 20 years SEAPOL has established itself as an apolitical forum where experts and officials can have frank exchanges over

* Frances Lai

sensitive issues. Fisheries, being one of the most important ocean resources related directly to the well being of the people, is central to our concerns. We have devoted some of our forums specifically to Fisheries, such as the international workshop on "Challenges to Fishery Policy and Diplomacy in Southeast Asia" held in Rayong a number of years ago. More often, we have the discussion of fisheries issues in context such as the discussion of fishery problems in the Gulf of Thailand and the Fisheries Industry in the context of Ocean Governance. Because of the nature of the programme and our strong roots in the Law of the Sea, our approach to the various ocean issues is holistic and integrative.

SEAPOL does not have in-house researchers or teaching staff but we do carry out research and hold training courses and seminars. Our vast network of experts has been our greatest asset. Not only have they provided us with their generous advice but they are also our source of top grade researchers and lecturers. With their support SEAPOL was able to commission the most appropriate experts within and outside the region to conduct specific research or study. We also work closely with national and international institutions in research and capacity building. In our traveling seminar project, we arrange for visiting ocean experts to deliver their lectures at various national institutions so that important opinions and lectures can be shared. SEAPOL organized workshops of various topics. People from the fishery sectors were also invited to our seminars on environment and training courses in ocean law. The very fact that SEAPOL does not have its own in-house researchers or teaching staff makes it necessary for it to work with and not to compete with other ocean programmes in the region. Since its establishment one of the main objectives of SEAPOL is to strengthen national capacity in ocean law, policy and management. Through years of activities with experts in the field SEAPOL was able to stimulate and support the establishment of national marine affairs centers in the region.

Another main objective of SEAPOL is to promote networking among ocean experts. This was further expanded to networking of ocean policy institutions. SEAPOL initiated a regional network of marine affairs institutions (MAIN to be short) in the Year of the Ocean, 1998. National institutions in marine affairs in the region were identified and invited to join the network on a voluntary basis. Each member is to take turn to host a forum on important aspects of marine affairs in the region. The host is to be responsible for the onsite expenses, including hotel accommodation for one representative from each member institution while the travel expenses will be on a self-financed basis. Next year the meeting is to be hosted by the Korean Maritime Institute. It is agreed that the main theme for the Fourth Regional Forum will be "Regional Fishery Management."

SEAPOL is one of the first programme in Southeast Asia to promote the importance of dialogue between scientists and policy makers in ocean management. In our current Gulf of

Thailand project, a Scientist was commissioned to report on the issues of “Over-fishing in the Gulf of Thailand” and to make policy recommendations on the basis of his findings. Relevant government officials from the four coastal states were invited to comment and interact with the researcher. It was during such process of interaction that the idea of an intergovernmental mechanism on cooperative management of the ocean resources and environment of the Gulf of Thailand emerged.

In the initial conception, not only would the relevant government officials of the four coastal states meet regularly to prioritize and coordinate ocean management in the Gulf, they will also work closely with existing programmes and organizations such as SEAFDEC, FAO, ICLARM, etc. in fisheries and avoid overlapping projects. The objective of the mechanism is to facilitate cooperation and coordination among countries as well as among national and international institutions in their common goal of improving the ocean environment and resources in the Gulf.

Asides from the on-going projects mentioned earlier, SEAPOL is expanding its work into providing consultant service in marine law and policy in its attempt to work even more closely with other institutions in the public and private sectors. SEAPOL is a modest non-governmental programme that thrives on cooperation and mutual support.

Thank you for your attention.

SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY (SIDA)

The Marine and Coastal Initiative – The Department for Natural Resources and the Environment at Sida*

Problems and issues

In the context of this presentation much space and time will not be allocated to describe the background picture on problems, issues and opportunities on which the marine and coastal initiative of Sida is based. In summary the sets of issues to be addressed is well reflected by the topics of this conference. Out of the internal documentation (in Swedish) on which the Initiative is developed within the context of Sida’s Department for Natural Resources and the Environment four segments could be highlighted:

- ♦ Marine and coastal areas and problems and opportunities linked to poverty and poverty alleviation
- ♦ The pressures and threats natural resources and the environment in marine and coastal areas
- ♦ Sustainable production of living aquatic resources and promotion of improved health standards
- ♦ Human capacity building at all levels – both among the rural and coastal population as well as among decision makers at central level

It should be noted that in applicable terms same basic thoughts are applicable in developing frameworks for the integration of living freshwater aquatic resources in programme development.

Basic principles and approaches

The Conference on Environment in Stockholm (1972) and the subsequent process leading up to the United Nations Conference on Environment and Development (UNCED) in 1992 are corner stones for Sweden in the approach to the integration of environmental concerns in all types of action – nationally as well as internationally. Marine environment and coastal development are included among prioritised areas in Sida’s “Programme of Action for Sustainable Development”. The Programme also includes sections on freshwater resources. The whole programme has its foundation in the Agenda 21 of the UNCED Conference – in

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the case of marine and coastal areas specifically Chapter 17. Together with a range of international and regional conventions and agreements, Agenda 21 provides norms and frameworks for a rational utilisation and protection of ecosystems and natural resources in marine and coastal areas. Relevant international conventions and agreements include:

- ♦ UNCLOS 1982 (the United Nations Convention on the Law of the Sea, 1982, <http://www.un.org/depts/los>)
- ♦ Development of the Code of Conduct for Responsible Fisheries and adopted at FAO 1995 (www.fao.org/fi/agreem/codecond)
- ♦ Development of the FAO Strategic Plan for Forestry (www.fao.org/forestry)
- ♦ Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973 (CITES) <http://www.wcmc.org.uk/cites>
- ♦ The Ramsar Convention (Convention on Wetlands of International Importance Especially as Waterfowl Habitat,) 1971 <http://www.iucn.org/themes/ramsar>
- ♦ The Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972 <http://www.unesco.org/whc>
- ♦ The Convention on the Conservation of Migratory Species of Wild Animals, 1979 <http://www.wcmc.org.uk/cms>
- ♦ The Convention on the Biological Diversity, 1992 <http://www.biodiv.org/conv>
- ♦ Furthermore, there are the Conventions under the International Maritime Organisation (IMO) such as MARPOL, OPRC, and the London Dumping Convention.

In addition to these conventions and international agreements the basis for Swedish programme development is also integrating aspects related to food security, security of livelihoods and environment in marine and coastal areas as well as security for investments.

One important contributing factor for the present state of wide ranging environmental degradation is that the responsibility for management of development schemes, natural resources utilisation and environmental protection in freshwater systems, marine and coastal areas are spilt up among various sectors and functions involved (fisheries, shipping, environment, industry, infrastructure, rural development, urban development, natural resources management, environmental protection, etc.) as well as on different levels of decision making.

Subsequently, there is an obvious need for more efficient coordination and integration in planning and management between the various sectors involved. Thereby frameworks could be created to minimise conflict and competition between different groups of stakeholders.

Addressing issues related to marine and coastal areas – and freshwater systems - are through the trans-boundary nature demanding coordination between and among global, regional and national sets of intervention.

Utilisation of resources in marine and coastal areas (and freshwater systems) must be developed in ways that leads to sustainability in that human and economic development can be maintained also for future generations. To achieve this there is a demand for clear, well-developed and coordinated *institutional frameworks* as well as regional, national and local *programmes of action* that allows for economic development while at the same time negative effects on ecosystems and the environment are minimised.

Activities to *mitigate potential conflicts* should, in cases related to the management of shared and common resources, be prioritised.

Planning, development and management of specific ecosystems and natural resources should, as far as possible, be implemented through *decentralisation* of responsibilities and financial resources to the level at which utilisation actually takes place.

To achieve the points referred to above it is also important to look towards cooperation and dialogue not only between the two divisions – the Rural Development Division and the Water Division - at the Department for Natural Resources and the Environment, but also between the Department and other departments within Sida.

Strategic considerations

Ensured contribution to poverty alleviation and increased food security based on sustainable uses and production while maintaining the natural resource base should be fundamental principles for strategic considerations with regards to planning and programming of interventions for the Department of Natural Resources and the Environment. In generic terms programme development should consider a number of aspects, such as:

Food security/sustainable production

- ♦ Support to the normative (conceptual) work in relation to sustainable fisheries (in its broad context of living aquatic resources). The implementation of the “Code of Conduct for Responsible Fisheries” is one major foundation in the dialogue to develop frameworks for sustainable management arrangements.
- ♦ Support to a, initially, limited number of intergovernmental fisheries organisations with a mandate to address issues related to the management of common/shared fish (and other aquatic) resources. The target would be to facilitate a process whereby the Code of

Conduct for Responsible Fisheries could be internalised – and nationalised – for the implementation of fisheries management of, in the case of Southeast Asia, commercially very important, and in many cases, threatened stocks.

- ♦ Processes that could contribute to a phasing out of present large levels of subsidies (and in specific the ones applied by the European Union) that today is one of the more fundamental factors in sustaining an overcapacity that in terms of numbers of (large) boats and application of efficient methods is threatening the sustainability of fisheries (in global terms). The reduction of (national and regional/intergovernmental) subsidies would contribute to a process of development of more sustainable management of some of the presently threatened fisheries around the world.
- ♦ “Environmental certification” of products of living aquatic resources on the basis of sustainable use of available resources and the maintaining of environmental quality. This would open an increased concept of “consumer awareness” in choices of selection of purchases of aquatic products. This could also open up for small-scale catchers/producers to get a market for more “eco-friendly” products (the higher price received for house chicken “*gai barn*” in Thailand is a good example).
- ♦ Development of management structures for marine and coastal development (and aquatic resources in general) that would be beneficial to a sustainable rural development in coastal areas. Basic importance is given to the need to provide for sustainable use and production of marine and coastal resources, economic development and creation of employment opportunities. The development of comprehensive and coordinated systems for planning and management of development in marine and coastal areas are necessary to minimise and mitigate damaging effects on ecosystems and natural resources due to urban development, infrastructure development (such as roads, harbours, industries, etc.). The Department of Natural Resources and the Environment should consider the possibility to issues of integration related to marine and coastal areas (and living aquatic resources in general) in connection with the planning for the support to rural development activities.

Maintaining the natural resource base

- ♦ Policy development, monitoring and interventions for the protection and sustainable utilisation of different ecosystems such as coral reefs, mangrove forests and other types of natural (marine) wetlands.
- ♦ Coordination and management of trans-boundary and regional issues related to, among other things, land-based sources of pollution and shared natural resources and ecosystems. The development of, and support to, intergovernmental institutions and initiatives with a mandate to address issues of resource management and environmental protection is in this context of special importance. This includes also the “upstream-downstream” problems related to large (international) river systems.

- ♦ Support to the implementation of activities to prevent and reduce marine (and water in general) pollution and environmental degradation. Pollution related to shipping, oil exploration and handling of various types of hazardous products (off-shore and on-shore) is today one of the major threats to ecosystems in coastal areas.
- ♦ Monitoring and follow up of the international development and debate on the “marine” (and aquatic in general) arena – partly to maintain an internal competence and partly to be able to give well founded advice to the Ministry of Foreign Affairs, the Ministry for Agriculture (of which fisheries is a sub-sector), the Ministry of Environment, etc.
- ♦ Involvement in the processes of development bilateral support strategies for individual countries by explaining and emphasising problems and opportunities with regards to marine and coastal areas and poverty issues - among other things by emphasising the importance of living aquatic resources. In general, these strategies are not really addressing the problems, and opportunities, linked to development and environmental degradation in coastal areas. Living aquatic resources is another element that is not, as such, addressed in these strategies. In the case of Southeast Asia, Vietnam is one exception as in the strategy for Vietnam support for the capacity to utilise marine and coastal resources while at the same time maintaining a sound environment is explicitly stated as one priority for bilateral cooperation.
- ♦ Strengthening of the internal dialogue for increased cooperation with other departments at Sida, among other things with the purpose to:
 - Aim for effects of synergies in planning and implementation by making use of comparative competencies
 - Increase internal “learning” processes
 - Integration of various sector and thematic issues in the development of frameworks such as those related to Environmental Impact Assessment, social assessments, etc.

Means of interventions

The limited amount of personnel resources – 1,5 to 1,75 in terms of full time personnel – will have implications on the way in which programmes will be developed and the way interventions will be implemented. Subsequently, it will be important to look towards interventions that are easy to administer and to follow up. In practical terms this could imply some of the following features:

- ♦ Package solutions with comprehensive and coordinated programmes
- ♦ The integration of coastal and (living) aquatic resources components in the preparations for general rural development programmes, or within the framework of ongoing water resources management programmes funded by Sida.

- ♦ Joint funding should be attempted with other (likeminded) donor agencies through sector and/or programme support approaches – either as a “silent” partner or within the framework of more active formats.
- ♦ Development of systems for the use of “institutional consultants” (units within government agencies) for follow up and monitoring of programmes. This could also be applied in combination with commercial consultant companies (with suitable competence) for the actual implementation of activities.
- ♦ Use special funds (programme funds) for recruitment of resource persons on short and longer-term basis.

Swedish human capacity development

Why Swedish engagement in marine and coastal development and aquatic resources management? One important reason is that there is a good level of capacity and competence to be found in Sweden – Sweden have something to offer not only financially but also by being able to provide resource persons in various relevant fields.

Swedish authorities, like those related to fisheries, shipping administration, environmental protection, planning, chemical inspections, etc. have all in their respective fields of responsibility relevant knowledge and competence. Long-term experiences of planning and management for marine and coastal areas (and living aquatic resources) are also available by commune administrations and county administrative boards. The experiences in work with developing country situations are, however, a bit limited. There are exceptions with some commune administrations directly involved in Sida supported programmes. Limitations in numbers of staff are another obstacle for them to engage in longer-term commitments. One way around that could be to develop more far-reaching (in scope and time) programmes, including the allocation of financial resources and various forms of “twinning” arrangements. This would also benefit a more internationally “adaptive” feature of the competencies available.

Looking beyond the government agencies, there is also a broad range of experiences and expertise among consultant companies. Admittedly there are not that many that specifically specialises in marine and coastal development. An increase in the number of marine and coastal programmes (and living aquatic resources) could possibly enhance the marine and aquatic profile of companies and individuals in Sweden.

Other routes to develop capacity and competence, and to secure that young people become engaged, in Sweden is through various forms of secondment. Present forms includes direct secondment (on a case by case basis), junior or associate expert positions (JPO and APO) to

international organisations, bilateral associate experts (BBE) within bilateral programmes and “minor field studies” for students to make their degree work on developing country issues.

Tentative set of activities for 2002 (planned and ongoing)

Below is a short list on presently ongoing programmes and projects receiving Sida funds together with some tentatively planned programmes in order to give a very general idea on how and where funding is applied. Note that the list in general only refers to programmes and programme planning handled by the Department of Natural Resources and the Environment. The list also includes support being given of relevance for freshwater living aquatic resources in Southeast Asia.

Interventions at “global” level

- ♦ World Maritime University (WMU) for education related to shipping and harbour development (linked to the International Maritime Organisation, IMO) - ongoing
- ♦ GIWA for assessments of water and aquatic resources and environmental problems (linked to UNEP) - ongoing.
- ♦ Policy development and implementation of programmes for sustainable management of coral reefs in cooperation with World Resources institute - ongoing.
- ♦ Support to ReefBase and activities for economic valuation of coral reefs through ICLARM – ongoing
- ♦ Implementation of the Code of Conduct for Responsible Fisheries – planned
- ♦ Cooperation with WWF for work at global level against subsidies in (large scale) fisheries and for the protection and sustainable use of mangroves, coral reefs, etc. The programme would include support to the development of environmental certification of fisheries products through the Marine Stewardship council - planned.
- ♦ Cooperation with IMO based on the position of being the secretariat for the major part of marine/maritime conventions and global agreements related to the protection of the marine environment, and because of IMO’s specific competence in the prevention of problems related to environmental degradation in marine and coastal areas - planned.

Interventions at “regional” level

- ♦ Support to, an initially limited amount of, selected regional fisheries bodies in Central America/Caribbean, Africa and Southeast Asia for sustainable management of shared and trans-boundary stocks – including a regionalisation of the Code of Conduct for Responsible Fisheries – planned.
- ♦ UNEP Regional Seas Programme
 - Caribbean Environment Programme – ongoing
 - East Africa, West Africa and Southeast Asia – planned

- ♦ Support to a PDF/GEF programme development for the Bay of Bengal Large Marine Ecosystem through FAO – ongoing
- ♦ The Mekong River Commission (Environment Programme, Basin Development Plan and Institutional Support) – ongoing
- ♦ AIT Aqua Outreach Programme – aquatic resources and smallholder aquaculture in Cambodia, Lao PDR, Thailand and Vietnam – ongoing
- ♦ Legal and institutional Frameworks, and Economic Valuation of Resources and Environment in the Mekong River Region – A Wetlands Approach through ICLARM – ongoing

Interventions at “national” level

- ♦ Pilot project for integrated coastal planning and management in Tanzania – ongoing
- ♦ Integrated coastal planning and management, and development of capacity and methods for sustainable use of natural resources. Should include elements related to locally based involvement in planning and management of natural resources. So far planned for Vietnam but could include other countries.
- ♦ Various pilot project implemented nationally through regional programmes (see above)
- ♦ Bilateral programmes without explicit marine or coastal focus but implemented in coastal provinces, such as programmes for support to environmental authorities, land administration, public administration, etc. Also applicable to freshwater systems.

Advisory services

- ♦ Improvements of systems for advisory services to the Department of Natural Resources and the Environment as well as Sida in general in the form of a “marine and coastal help desk” on issues related to planning and management in coastal areas. This one should be seen as complement to the help desk established at the Swedish University for Agricultural Sciences related to Environmental Impact Assessment issues. The role would, among other things, be to assess needs for planning and coordination, assess effects on the marine and coastal environment caused by various interventions, provide inputs into processes to develop bilateral country support strategies and for technical responses to various ministries in Sweden.

Human capacity development

Work out a plan for development of a (Swedish) human resource base on a 5 – 10 years horizon. Areas and subjects of importance includes ecological economy, physical planning, provincial and local coastal planning and management, environmental legislation, systems ecology, natural/social/economic geography, anthropology, etc. Various avenues could be used such as:

- ♦ A more long-term planning and an increase the present amount of Minor Field Study opportunities and positions as Associate/Junior Professional Officers and Bilateral Professional Officers. Various forms of secondment to international organisations and a more active encouragement for Swedish resource persons to seek international positions at UN-agencies, Multilateral banks and other international organisations.
- ♦ Twinning arrangements with Swedish commune administrations and county administrative boards and similar functions in developing countries. This would open for cooperation with other units at Sida.
- ♦ Increased cooperation with institutional consultants (Swedish authorities, like those related to fisheries, shipping administration, environmental protection, planning, chemical inspections, etc.)
- ♦ Increased availability of doctoral scholarships in relevant fields

TOKYO UNIVERSITY OF FISHERIES (TUF)

University Approach from Japan for the International Cooperation on Fisheries Research and Education in Southeast Asia *

Under the Ministry of Education, Culture, Sports, Science and Technology, the universities in Japan are strongly encouraged to promote the international cooperation on the higher education level, especially for the human resources development through several channels. Concerning the field of Fisheries and Marine Sciences, the recent activities will be reviewed here with the special references on the international seminars, the cooperative research activities and the academic agreements for the student and staff exchange program in the Southeast Asia.

For the purpose of promoting the academic cooperation in Asia, the Japan Society for the Promotion of Science (JSPS) offers the Core University Program for the fisheries science, which was initiated by Indonesia in 1995, and followed by Philippines in 1998, Thailand in 2000, and Korea in 2001. Each Core University designated in Japan and its counter-part country provide the program for scientist exchange, cooperative research and international seminars, by organizing the member universities in each side. The number of exchanges can be 10-25 every year for hosting and visiting respectively in each Core University Program. Seminars were held periodically on specific topics such as Food Processing (1995), Aquaculture(1997), Fishing Technology(1999) and Joint Seminar(2000) in Indonesia, and Social Science(1998) and Capture Fisheries(2001) in Philippines, and Shrimp Farming (2001) in Thailand to identify the seeds and needs of the cooperative research activities, as well as to distributes its fruits. The Multi-lateral approach will be the next phase through establishing the strong linkage among bi-laterals towards the goal of sustainable fisheries in Asia.

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WORLD TRADE ORGANIZATION (WTO)

Statement during the ASEAN-SEAFDEC Conference: "Fish for the People"*

Ladies and Gentlemen,

As all of you know, the WTO Ministerial Conference which was held in Doha, Qatar from 9 to 14 November 2001 with the intention of launching a new negotiating round to further liberalize world trade, successfully terminated its work after long and difficult discussions. The Ministerial Declaration from the Conference states that Members agree "to undertake the broad and balanced Work Programme" set out in the Declaration. This includes both "an expanded negotiating agenda and other important decisions and activities necessary to address the challenges facing the multilateral trading system."

Tariffs

Issues of particular interest to the fishery sector have been included on the negotiating agenda. One such issue is the reduction or elimination of tariffs on non-agricultural goods, including the reduction or elimination of tariff peaks, high tariffs, and tariff escalation, as well as non-tariff barriers, in particular on products of export interest to developing countries. Ministers agreed that product coverage "shall be comprehensive and without *a priori* exclusions." Moreover, the "negotiations shall take fully into account the special needs and interests of developing and least developed country participants, including through less than full reciprocity in reduction commitments...". Even though the average tariff on fish and fish products applied by developed countries was reduced from 6.1 per cent to 4.5 per cent, or by 26 per cent as a result of the Uruguay Round, most OECD countries apply higher tariffs on processed fish products than on fresh and frozen fish destined for further processing. Negotiations in this area may therefore further diminish tariffs peaks and tariff escalation on fish and fish products.

Subsidies

Another subject included in the Ministerial Declaration of particular interest to fish and fish products is subsidies, a subject which has been debated for several years in the WTO Committee on Trade and Environment (CTE) and also in the General Council on several occasions. Ministers agreed to "negotiations aimed at clarifying and improving disciplines" under the Agreement on Subsidies and Countervailing Measures "while preserving the basic

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concepts, principles and effectiveness" of the Agreement and taking into account the needs of developing and least-developed participants. In a first phase of the negotiations, "participants will indicate the provisions, including disciplines on trade distorting practices, that they seek to clarify and improve in the subsequent phase." Fishery subsidies were not forgotten as the Declaration especially provides that "In the context of these negotiations, participants shall also aim to clarify and improve WTO disciplines on fisheries subsidies, taking into account the importance of this sector to developing countries."

Committee on Trade and Environment and Labelling

As concerns work of the Committee on Trade and Environment (CTE) that may have an impact on fish and fish products, the instruction by Ministers to the Committee to give particular attention, in pursuing work on all items on its agenda within its current mandate, to *inter alia* :the effect of environmental measures on market access, especially in relation to developing countries, in particular the least-developed among them, and those situations in which the elimination or reduction of trade restrictions and distortions would benefit trade, the environment and development would seem particularly pertinent. The Committee should also give particular attention to "labelling requirements for environmental purposes", an item of interest to this Conference and to fisheries in general. Work on this and other issues should include the identification of any need to clarify relevant WTO rules. The CTE "shall report to the Fifth Session of the Ministerial Conference and make recommendations, where appropriate, with respect to future action, including the desirability of negotiations." The Declaration goes on to provide that the "outcome of this work ... shall be compatible with the open and non-discriminatory nature of the multilateral trading system". It "shall not add to or diminish the rights and obligations of Members under existing WTO agreements", in particular the SPS Agreement, "nor should it alter the balance of these rights and obligations." Furthermore, the needs of developing and least-developed countries shall be taken into account.

Other issues

There are of course a number of other issues in the Ministerial Declaration dealing with important issues such as for instance export subsidies in agriculture, access to drugs for public health reasons for developing countries, questions related to the environment or to the relationship between trade and investment, etc. most of which are questions with no direct or immediate impact on the fisheries sector wherefore I will not take up your time with those. However, copies of the full Declaration, is available from the SEAFDEC Secretariat.